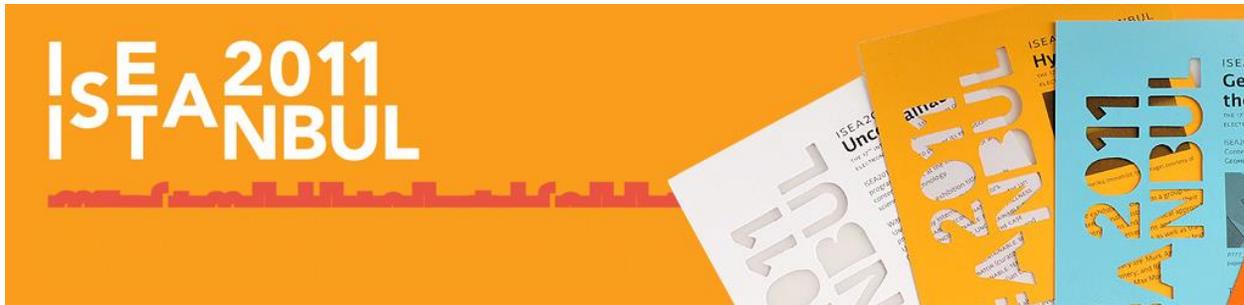


ISEA2011 ISTANBUL
THE 17TH INTERNATIONAL SYMPOSIUM
ON ELECTRONIC ART



Conference Proceedings

14–21 SEPTEMBER 2011



**ISEA2011, the 17th International Symposium on
Electronic Art
September 14-21, 2011, Istanbul, Turkey**

ISEA2011 and ISEA International publish these conference proceedings as a collaboration between Sabanci University, Leonardo/ISAST and Goldsmiths College, University of London.

ISEA2011 was organised by Sanbanci University
Lanfranco Aceti, ISEA2011 Artistic Director & Chair
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1732	Performative Encounters In Media Art: An Unsitely Aesthetics	Maria Miranda
1738	Playground Gaming With Wii, Kinect And Processing	Grethe Mitchell & Andrew Clarke
1744	New Aesthetic Energy Infrastructure And The Land Art Generator Initiative	Elizabeth Monoian & Robert Ferry
1751	From Archive To Retroscope And Beyond: Pushing Forward Resource Development	Catherine Moriarty
1756	Theorizing New Media In A Global Context	Soraya Murray
1762	Huggable Nature Workshop	Hye Yeon Nam
1767	An Amorphous Image Process	Kevin Sarmiento Navarro
1771	Digital Technology, Social Media And Emerging Trends In Film Production Methodologies	Jodi Nelson
1778	Aesthetics Of Voice	Norie Neumark
1785	Sketches Of An Interdisciplinary Practice	Kim Newall & Charles Walker
1792	The Hidden Histories Of Objects: Provenance, Storytelling And Tagging Technologies	Simone O'Callaghan & Chris Speed
1798	Network Media: Exploring The Sociotechnical Relations Between Mobile Networks And Media Publics	Rachel O'Dwyer
1804	Partially Buried University	Karen O'Rourke
1810	Ludic Listening: Sound Art In Video Game Design	Aaron Oldenburg
1813	Bodies, Interactivity And Technicity In Media Art	Andreia Oliveira
1819	Nanovibrancy: An Auditory Performance Of Nanoscale Resonance	Joel Ong
1826	Touch Interfaces: Between Hyperrealism And Invisibility	David Oswald
1831	The Light At The End Of The Tunnel: An Interactive Installation In Public Space	Selin Ozcelik
1834	The Rhetoric of the JPEG	Daniel Palmer
1840	Examining Issues of Body Image and Complex Regional Pain Syndrome within the Digital	Mark Palmer
1848	On Breathing And Geography: Sonifying The Severn As Shared Generative Art Practice	Michaela Palmer
1854	Wakeful Software And Wakeful Musical Instruments: A Theoretical Approach To The Implementation	Fabio Paolizzo
1860	Mobility Into Immobility: Designing Networks	Luisa Paraguai
1866	Direct To Video: Stephen Beck's Cameraless Television	Kris Paulsen
1872	Transcending Into The Virtual: Presence Prognostications And The Re-Calibration Of Telematic Art	Ellen Pearlman

1878	BodyCAD: Creative Architectural Design Through Digital Re-Embodiment	Banu Pekol
1884	Subtle Presence: Design and Implementation of User Centric Content Delivery Using Biometric Data Capture and Intelligent Analysis	William Pensyl
1890	Art ↔ Science Relationalities	Olivier Perriquet & Bill Seaman
1896	You Hold the Camera Now: An Action Research Case Study of Pre-kindergarten Transmedia Narrative Design	Gabriel Peters-Lazaro
1899	Pursuing The Unknowable Through Transformative Spaces	Maja Petrić
1906	Big Bird is Watching You!: Art, Activism and Technology in the Public Arena	Denitsa Petrova
1912	Mass Body Index: Bio-OS, a Biological Operating System	Mike Phillips, Birgitte Aga, Gianni Corino & Simon Lock
1919	The Choreographic Horizons Of Isabel Rocamora: 'Incalculable' Exiles	Annalisa Piccirillo
1925	The Estonian Experience: Non-Institutional Media Art Production In Estonia	Piibe Piirma
1928	The Rhetorical Art Of Data Visualisation	Jeremy Pilcher
1934	Digital And Interactive Choreography: Innovative Women In The Dance History	Ludmila Pimentel
1938	The Food Side Of Sound Aesthetics	Leandro Pisano
1944	Visualizing New Media Art In Central Eastern Europe	Agnieszka Pokrywka
1949	Digital Art And Culture After Industry? Towards Aesthetic Business Studies	Søren Pold & Christian Ulrik Andersen
1955	The Big Bang Of Electronic Art: Merging Abstraction And Representation In The Age Of Digital Imaging	Anat Pollack
1958	Opera and the Cult of the DJ	Justine Poplin
1964	New Media Contemporary Information Paradigms: The Reordered Memory On FILE Archive Structures	Gabriela Previdello Orth
1968	Cityscapes: Exploring The Spirit Of Urban Identity	Francesco Proto & Richard Vickers
1972	Beyond Paradigmatic Shift: Mapping Culture And Society Of Digital Age	Mikhail Pushkin
1978	Data Trash	Melinda Rackham
1981	Terra Virtualis: They Are Reality	Melinda Rackham
1984	Tracing The City: Exploring The Private Experience Of Public Art Through Art And Anthropology	Martha Radice, Kim Morgan & Solomon Nagler
1990	Digital Anthropophagy And The Anthropophagic Re-Manifesto For The Digital Age	Vanessa Ramos-Velasquez
1998	A Potential Landscape	Jonas Ranft
2004	Visualising Emotions And Autism	Barbara Rauch
2011	Stichtures: Interactive Art Installation For Social Interventions	Claudia Rebola, Patricio Vela, Chauncey Saurus, Tayo Ogunmakin & Jorge Palacio
2016	Flying Robotic Arts For HRI And Interface Research	Nicolas Reeves & David St-Onge
2023	The Genealogy Of A Creative Community: Why Is Afternoon The 'Granddaddy' Of Hypertext Fiction?	Jill Walker Rettberg
2030	Are You Really T/Here? Affect, Affordance And Vitality In Heterotopii Of Flows	Kate Richards
2036	Herding Cats To Infinity	Peter Richardson
2042	Machine Music Through The Ears Of The Repairman	Morten Riis
2048	Techno-Cultural Asymmetry In Latin America	Claudio Rivera-Seguel
2054	Gestus	Hector Rodriguez

2059	The Work Of Art And The Internet. New Curatorial Issues: NETinSPACE, A Case Study	Elena Giulia Rossi
2065	Laborers of Love/LOL: Behind the Scenes	Stephanie Rothenberg & Jeff Crouse
2070	Aesthetic 3D Rendering Of Historic Shipwrecks: An Artist's Intervention In Maritime Archaeology	Chris Rowland
2077	Digital Paint To Digital Photography: The Long Reach Of Abstract Expressionism	Cynthia-Beth Rubin
2081	Feedback As Self-Performance	Steve Rushton
2087	Insecure Territories: Interventions In City Interfaces	Georg Russegger
2090	The City As Ludic Interface: Vectors Of Vireal Testlabs In Urban Mediatecture	Georg Russegger
2094	Virtual Doppelgänger: Embodiment, Morphogenesis, And Transversal Action (Panel Introduction)	Susan Elizabeth Ryan
2097	Crying With The Virtual	Semi Ryu & Stefano Faralli
2104	Suzumushi: A Silent Future	Gavin Sade
2109	Stop-Motion Animation: Towards A Realistic 3D Camera Movement Control	Laura Saini, Nicolas Lissarrague, Gudrun Albrecht, Lucia Romani
2115	GUTAI Movement in Japan and Art Afterwards. Towards New Understanding of Current Media Art	Rie Saito
2119	Moments of Liminal Space: Methodologies and Practices for the Study of Transition	Melissanthi Saliba
2125	Fashionable Wearables in Digital Performance	Marios Samdanis, Yikyung Kim & Soo Hee Lee
2132	Social Media As Art And Vs Art	Manthos Santorineos & Stavroula Zoi
2137	Cosmopolitanism And Narration: The Digital Tale	Viola Sarnelli
2143	Future Master Craftsmanship: Where We Want Electronic Textile Crafts To Go	Mika Satomi & Hannah Perner-Wilson
2150	The Magnetic Field Of Audiovisual Art Practices	Nermin Saybasili
2156	The Interactive And Immersive Experiences Shape The New Architectural Language	Teresita Scalco
2159	Is Augmented Reality The Ultimate Museum App? Some Strategic Considerations	Margriet Schavemaker & Hein Wils
2165	Error In Apparatus As Aesthetic Value	Alejandro Schianchi
2169	Powering Ecological Futures	Lea Schick & Anne Sophie Witzke
2177	Conceptual Relations: Musical Representations Do Not Need Music Theory	Sebastian Schmidt, Thomas Alexander Troge. & Denis Lorrain
2184	Responsive Illuminated Architecture	Christian Schneider. & Stefan Müller Arisona
2188	War And Art In The Screenic Era	Adam Schrag
2194	Interactive Technotextiles: The Hybrid Between Textiles And Technology	Bettina Schülke
2200	Design Of An Interactive Cultural Heritage Experience: The Historical Orchestra	Ferhat Şen & Reha Dişçioğlu
2206	ART<>SCIENCE: An Ontology	Timothy J. Senior & Florian Wiencek
2209	I, Robot: Rethinking Jack Burnham's Systems Esthetics	Margaret Seymour
2215	Improving The Information Society Through Awareness Of Languages	Alan N. Shapiro
2220	North, Interrupted	Leslie Sharpe
2226	Art And Play In Interactive Projections: Three Cases	Geoffrey Shea, Michael Longford & Elaine Biddiss

2232	Visualising Invisible Networks As Collaborative Arts Practice	Pip Shea
2238	Object Geography: The Internet Of Things	Duncan Shingleton
2244	Choreographing Topological Spaces Within Dance Performance With Real-Time Video	Kate Sicchio
2251	Walkingtools Concepts: Rethinking Locative Media	Cicero Silva & Brett Stalbaum
2256	Geo Sound Helmets: Breath-Controlled Installation	Cara-Ann Simpson, James Laird, Ben Landau & Eva Cheng
2262	Betaville: The View From New Brooklyn	Carl Skelton
2268	Data Disinformation: Data Manipulation And Imagemaking	Helen Sloan
2271	Cleaning And Character In Motion Capture Portraits	Susan Sloan
2274	Haul Out: Goodbyes	Tegan Smith
2280	Creating Black Boxes: Emergence In Interactive Art	Joan Soler-Adillon
2287	SOFT CLOUDING: Curating a New Semantics for Sound Archiving.	Morten Søndergaard, Thomas Markussen, Barnabas Wetton & Ivan Dehn
2293	Camera, Canvas, and Computation: New Frameworks for Representation and Abstraction	Anne Morgan Spalter
2296	Responsive Spaces: Motion, Activity and Interactive Art	Ryan Spicer, Andreea Danielescu, Aisling Kelliher & David Tinapple
2300	Syncretic Social Agency: Deterritorialised Robotics and Mixed Reality Data Transfer Systems	Julian Staddon
2305	Stitching Together an Editorial Sewing Circle	Åsa Ståhl, Kristina Lindstrom, Johanna Rosenqvist & Melin Margareta
2312	New Media and Exhibition Making: Some Forecasts	Jasmin Stephens
2315	@juspar and Now Quoting Galloway: "Code is the only language that is executable". Does What It Says. #code #chun #netpol1010	Igor Stromajer
2318	Cyvers city	Susana Sulic
2326	Neuro-Technology and Augmented Perception	Amanda Tasse
2329	Superdutch: New Media, Photography and the Internet-Polder	Jordan Tate
2332	Colour Data Processing	Jordan Tate, Adam Tindale & Ryna Boatright
2335	Urban Ecologies: Designing for Dystopia	Joni Taylor
2339	Intelligent Content and Semantics Algorithms: the next digital artists?	Luis Teixeira
2343	Reconsidering Media Art Dynamics	Nell Tenhaaf
2350	Future Guides for Cities	Michelle Teran
2356	Between Past And Future: Collaborating In The City Space	Mikkel Thelle
2359	Playing With The City	Iouliani Theona & Dimitris Charitos
2362	Mapping By Ourselves: Towards A Media History Of Geomobility	Tristan Thielmann
2369	Towards A New Symbiosis In The Mexican Environment: Art & Science	Reynaldo Thompson & Juan Angel Mejia
2376	[i-metro] Universal Access To Information	Therese Tierney
2382	The Nature of (in)Perfection	Kevin Todd
2389	Capturing Gestures For Expressive Sound Control	Todor Todoroff, Cécile Picard-Limpens, Julien Leroy & Alain Crevoisier
2396	Towards Geospatial Cultural Planning: Strategies For Local Cultural Innovation With Locative New Media Art	Tanya Toft
2402	The Unforgiving Ratio	Darren Tofts

2407	Computers As Metaphor, Minds As Computers; Notes Towards A Dysfunctional Robotics	John Tonkin
2411	Here To There And In Between: Commuting Through Perception	Jack Toolin
2417	The Memory And The Code: The Phantasm Of Digital Culture	Javier Toscano
2422	Skedimata: Guinea Pig And Performer	Patrick Tresset, Frederic Fol Leymarie & Nanda Khaorapapong
2428	From Immaterial To Hypermaterial	Colette Tron
2434	Transforming The Physicality Of Emotion	Joan Truckenbrod
2439	Intersections Of Interdisciplinarity: Technological, Transnational And Feminist Formations In The Public Electronic Art Of Muriel Magenta	Tanfer Emin Tunc
2445	Embedded Sound: A Project On Turkish Traditional Calligraphy And Its Multi-Touch Transformation	Adviye Ayça Ünlüer, Oguzhan Ozcan & Hüseyin Kuşçu
2452	Urban Cracks: Interstitial Spaces In The City	Elly Van Eeghem, Riet Steel, Griet Verschelden & Carlos Dekeyrel
2459	From Literal To Metaphorical Utopias: Space And Time In The White Cube	Christina Vatsella
2465	Two Steps Back And One Step Forward: Remediation As Innovation Factor In The Case Of Machinima	Thomas Veigl
2472	The Making Of Diamandini: Perception, Identification, Emotional Activation During Human-Robot Interaction	Mari Velonaki
2475	Digital Materiality – Making the Ungraspable (<i>Unbegreifliche</i>) Perceptible	Eva Verhoeven
2478	LIFE-LOG-ART	Lenara Verle
2481	Imagining The Social Change: New Media In Czech Art Discourse In The 1990s	Jindra Veselska
2484	Morphogenesis	Christophe Viau
2490	Many With A Mobile Cameraphone: The Democratization Of Documentary?	Richard Vickers
2497	Self-Trackers: Why Do They Prefer The Spreadsheet To The Sofa?	Stephanie Vidal
2504	Capturing Dance And Choreotopography: Analyzing And Visualizing Complexity	Kim Vincs
2509	Fashion Hacking As Shapeshifting	Otto von Busch
2515	Evolving Spaces Along Network Technologies	Sandrine von Klot, Ebru Kurbak, Isabella Hinterleitner & Mathias Mitteregger
2521	Theoretical Discourse On 'Art, Science And Technology Collaboration' And Its Historical Development	Lioudmila Voropai
2527	Beyond The Conflict Of The Faculties: A New Institutional Case Study Of The Founding Of A Radical Transdisciplinary Art/Science/Technology Program	Charles Walker
2530	Painting Further Along The River	James Faure Walker
2532	Design For Life	Meredith Walsh
2539	Integrating Weebly And Go Daddy.Com In A Streaming Media And Audio Production Portfolio Course	Daniel Walzer
2543	A Layered Process: Lyrical Improvisation	Beth Warshafsky
2546	Classical Hollywood As An Epistemological Network	Birk Weiberg
2552	Encountering the Body in Art, Online: VAINS (Visual Art Interrogation and Navigation System) the Abjection Application and the Neural Art Navigation Tool	Lee Weinberg & Eleanor Dare

2558	The Im/possibility of Time Regained: Navigating the Unstable Past, Present and Future of Internet Art	Annette Weintraub
2565	W0rdM4g1x. Or How to Put a Spell on Media Art Archives.	Nina Wenhart
2571	(He)artbreaking to the Core. Zombie Data and the Arts of Re/De/Transcoding	Nina Wenhart
2577	Liminoid Acts	Emma Westecott
2583	Local Colour and Networked Specificity	Mitchell Whitelaw
2587	The (Re)Mediation of Experience: A Case Study	Florian Wiencek & Stephanie Sarah Lauke
2590	The Aesthetics Of Private Footage And Youtube Within Avantgarde Video Art	Paul Wiersbinski
2593	Flying, Spinning, And Breaking Apart: Live Video Processing And The Altered Self	Todd Winkler
2600	Motion In Place Platform: Virtual (Re)Presentations Of Iron Age Movement	Kirk Woolford & Stuart Dunn
2607	Sky Knowledge: The Square Kilometre Array (SKA) As A Focus For Art-Science Collaborations	Suzette Worden
2613	Place In Mind: Towards A Dynamic Memory Palace	Adrienne Wortzel & Damon Loren Baker
2617	Playing In Place Nowhere: Creating An Open Source Country	Andrew Y. Ames & Alexia Mellor
2623	Benji: A Brief History Of The Man Who Brought The Intelligence Of Search To Our DNA	Amy Suo Wu
2626	Basic Interaction Design Education: Creative Solutions in Visualising Actions	Asim Evren Yantac & Oguzhan Ozcan
2631	Augmented Movement Vision: Moving, Seeing and Sensing	Tyng Shiuh Yap
2637	Just Type: A Multichannel Platform For Experimental Typefaces	Jesvin Puayhwa Yeo
2643	Electronic Music And Two Composers From Turkey	Seyit Yore
2649	Solar Artworks	Nacho Zamora
2655	Remix Cultures And The Imagining Of Alternative Intellectual Property Policies	Martin Zeilinger
2661	Users Become Re-Creators: Enhancing Experiences Through Mapping	Anja Zeising & Dennis Krannich
2666	Eye Gaze As A Vehicle For Aesthetic Interaction: Affective Visualisation For Immersive User Experience	Brigitta Zics
2672	'In The Rear": Artistic Concept And Different Spatialisation Methods	Lidia Zielinska & Rafal Zapala
2679	Collaboration Models In Big South Lab	Andreas Zingerle, M.A., Tyler Freeman, Lars Kynde & Anne Nigten
2686	Neurobodygame: The Design Of A Wearable Computer For Playing Games Through Brain Signals	Rachel Zuanon & Geraldo Lima

EXERCISES IN REMOTE COLLABORATION - HUIS CLOS / NO EXIT - (OR, "HOW CYBERFORMANCE REVEALS INTIMACY")

Annie Abrahams

In 2009 I started the artistic research project *Huis Clos / No Exit*. In this project I use a specially developed interface to unite several people remotely in a shared performance space that becomes subsequently both a laboratory and a playground. The performance experiences using this interface, suggest that today's intimacy is no longer revealed through private images but through behavior captured in real time interactions.



Angry Women, Annie Abrahams, screencapture of a performance test. bram.org/angry/women

Nowadays, people use webcams to film themselves and to express their ideas and feelings to the unknown other that will look at their videoblog. People rarely use their web- or phonecam to talk to someone else. The use of Skype is either very business like or restricted to family members. In Internet applications as Chatroulette people rarely exchange more than a glance. What they look for is their alter ego or an opportunity.

In her book *Alone Together* Sherry Turkle [1] describes how we hide more and more behind technology, how intimate communications start being something to avoid rather than to look for, how smartphones help us to flee our fear of the other, how we learn to control our relations via interfaces and how we are adapting our behavior to this new situation. Facebook teaches us how to simulate intimacy, how to make relations easy, clean, and without danger. At the same time, these relations also become superficial and makes us ask: Who are we when we don't perform? Why can't we show our vulnerable, messy sides? Why can't I be boring and cherish solitude anymore? In a society where authenticity and privacy become endangered it is important to find ways to access our vulnerabilities and doubts, to make them public, to cherish our messy side, to make place for the beast in the beauty, to go back to reality, to claim the human.

In 1998 I worked with at least eight other French artists, who I never met, on a collaborative website called *lieudit.org*. The site and the collective died in 2000, but I still have very nice memories of, for instance, our IRC rendez-vous during the launches of the virtual exhibitions we organized. Collaborating on a shared website was very stimulating, but in the end we couldn't find a common goal to make us better negotiate our differences and so we split up. It was very frustrating to learn that behind our machines we couldn't overcome these political, philosophical and emotional differences, that problems were exaggerated and stayed insurmountable.

This was the first time I noticed that collaboration using machines wasn't easier, maybe not more difficult either, but different from ordinary face to face communication. Later experiences with online collaborative creation interfaces, for instance Furtherfield's Visitors Studio, confirmed this. So, in the early 2000s when people started talking, dreaming and glorifying the advantages of Internet collaborations, I was very doubtful and somewhat vexed; and so decided to start thinking about how to use the recently developed streaming interface of *panoplie.org* for working on these problems. (1)

In telematic performances intimacy is not where you think it is. *The Big Kiss* performed with Mark River (of MTAA) in New York in 2007 [2] might have looked as an intimate performance, but in fact it was closer to a 'drawing à deux' session than to a real kiss, even if it did awake intimate feelings, as drawing a kiss on paper might also have done.

In the telematic performance *One the puppet of the other*, with Nicolas Frespech (Paris 2007), [3] we felt most intimate, most close together when we didn't exchange, when we were waiting, when nothing happened.

In 2009 I started *Huis Clos / No Exit*: a networked performance series investigating collaboration at a distance and relational dynamics in a dispersed group. [4] With an interface developed by Clément Charmet (*panoplie.org*) and Estelle Senay (Théâtre Paris-Villette / x-réseaux) I could unite the images and sounds of the webcams of up to six participating performers in a mosaic. The physically separated performers could share borders and interaction surfaces in a common virtual space and become co-responsible for the mosaic image projected in front of the public during performances. At all times they had this same mosaic image on their screen.

A first experiment took place in November 2008 in the International Laboratory of Interactive Digital Media on Stage, organized by NU2's in L'Animal a l'Esquena, in Celrà, Spain. In one of the tests, I asked three performers to execute a protocol that stated that, before leaving the performance interface they were to compliment the others after having insulted them. It was strange and beautiful to see how they couldn't stop complimenting and saying nice things to another. Later I became more and more aware of how the performance interface, besides allowing observation of behaviour in collaboration and auto-organization, can also reveal private, intimate behavior to the public. The cyberperformers are so occupied by their interactions, that they don't have time to negotiate their image as they mostly do on the Internet.

I talked about machine-mediated revelation of intimacy in an interview with Maria Chatzichristodoulou published in *Digimag* in Oct 2010. [5]

I always look for situations that make any attempt at escaping from exposure impossible. In general I do not rehearse my pieces. If this is necessary – for instance, due to technical reasons – I write new protocols for the final performance. I try to find ways to penetrate the other performer – just for a second I want them to expose themselves to me (and to our observers) in an action, or a response, that

is out of their control. I want them to unveil something they usually hide or only disclose in situations of complete trust, of complete intimacy. I want to know how they function, not by them telling me, but by me almost forcing them to reveal an instance of their 'hidden code' in public. I want us to go beyond self-representation and the control that this requires. Am I really forcing them to do this?... No I am not. What happens is that the situation in itself – that is, the telematic performance interface, the protocols, the flaws in the streaming connections – rewrites the conditions of communication in a way that makes this revelation possible, if not inevitable.

Because I think we need to counterbalance the tendencies to make our Internet-mediated relations cleaner, faster and more and more secure I started paraphrasing Rancière, “The real needs to be trapped in order to be available for thought.” [6] (2)

Notes:

(1) From 2006 - 2009 I organized the *Breaking Solitude* and later the *Double Bind* web performance series with panoplie.org. While they started out as performances around the idea of the Internet as a public space of solitude they became more and more involved with experimenting "different ways of being together." What can we share, what do we share, how are we interacting and what is this technology doing to us? <http://2008.panoplie.org/2008.panoplie.org/#//DoubleBind>

(2) Because the *Huis Clos / No Exit* interface makes people film their own image, a collaborative cyberperformance using it can also be staged as a live production of an autonomous video, available for reflection. <http://bram.org/huisclos/toutvabien/indexang.html>

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5. Maria Chatzichristodoulou, "Annie Abrahams: Allergic to Utopias," *Digimag58*, October 2010, <http://www.digicult.it/digimag/article.asp?id=1902> (accessed September 7, 2011).
6. Jacques Rancière, *Le Partage du Sensible: Esthétique et Politique* (Paris: La Fabrique, 2000).

THE DIGITAL CONTAMINATION OF DRAMATIC THEATRE: SUBJECT TECHNOLOGY IN EXCEPTION

Gorkem Acaroglu

Drawing on Derrida's analysis of the metaphysics of presence, this paper examines the centrality of presence in theatre commentary, arguing that such a privileging demonizes projected media as a form of contamination. Through a close look at a hybrid work that integrates live performers with avatars from Second Life, I seek a way to move forward between conditions of possibility and impossibility.

Dramatic theatre claims that it is a unique site of literal co-presence while asking audiences to forget their own presence and give precedence to a closed fictional world 'made present' by the auratic actor. In contemporary performance, two practices have emerged that shift these traditions: digital performance, where technology challenges the position of the actor as central; and live art or participatory performance that places the audience at the centre of the performance encounter. Although contemporary practitioners often rally against the prejudices of dramatic theatre, an understanding of its core assumptions can benefit emergent forms and prevent them from replicating those aspects deemed problematic in traditional practice. An awareness of literal, fictional and auratic presence as mediation can enable a richer theatrical encounter. I draw on Derrida's analysis of the metaphysics of presence to establish the centrality of presence in a significant amount of commentary on theatre, arguing that such a privileging of presence demonizes projected media as a form of contamination that impedes dramatic theatre's ability to represent 'truth.' While much has been theorized about presence in theatre, my position is that of a practitioner grappling with the problems that a privileging of presence brings to my work, of which I will examine a specific example.

From Greek antiquity onwards, discourses on the essential nature of the theatrical invoke some variation of what Peter Brook labels "a mystery called the present moment." [1] For example, playwright, actor and author David Cole claims, "theatre closes a great rift in our lives by enabling us to experience imaginative truth as physical presence." [2] Actor and Director Jean Louis Barrault believed that, "the final aim of mime is not the visual, but presence itself." [3] Practitioners like Eugenio Barba are concerned to define 'theatre's essence' which he claims, "consists... in radiating through the rigor of scenic technique an individual and collective *form of being*." [4]

'Being' can apparently be experienced through the actor's presence as expressed by actor and theorist Jean Pierre Ryngaert, "It is not always to be found in the individual's physical features, but in a radiant energy whose effects are felt even before the actor has acted or spoken, in the vigor of his being-there." [5] American director and teacher, Joseph Chaikin made similar claims, "It's that quality that makes you feel as though you're standing right next to the actor, no matter where you're sitting in the theatre... It's a kind of deep libidinal surrender which the performer reserves for his anonymous audience." [6]

Theatre is the place where co-presence of actor and audience apparently enables connection with the present moment. American designer Robert Edmond Jones believes that: "This is drama; this is theatre –

to be aware of the Now.” [7] Descriptions of theatre often refer to it as a unique site of presence, like Norwegian poet, writer and playwright Jon Fosse describes:

[...] these intense, clear moments, although they are hardly explainable, are moments of understanding, moments when the people who are present, the actors, the audience, together experience something which makes them understand something they never before have understood, at least not as they now understand it. [8]

I have quoted extensively here to demonstrate the privileging of presence in much twentieth century theatrical discourse.

Through these quotes, we see what Eugenio Barba describes as a search to “transcend the performance as a physical and ephemeral manifestation, and attain a metaphysical dimension...” [9] Antonin Artaud and Jerzy Grotowski both attempted to transcend performance by eradicating the text while Constantin Stanislavski and Bertold Brecht outlined ways for the actor to speak so that all traces of the text were not felt to be present. Stanislavski’s mission was designed to bring presence to the absence of the written word. It requires immense skill to achieve a sense of this, and we praise actors that give us the illusion of doing so. In his essay, *Just Be Yourself*, Philip Auslander critiques Stanislavski, Grotowski and Brecht, stating “all assume that the actor’s self precedes and grounds her performance and that it is the presence of this self in performance that provides the audience with access to human truths.” [10] It is this auratic actor that has been central to dramatic theatre, an idea which remained unchallenged until Derrida’s deconstruction of Western philosophy’s privileging of presence.

Derrida’s analysis of ‘the metaphysics of presence’ has become an important feature of recent performance studies and helps us to understand why projected media in performance has threatened dramatic theatre. The desire to attain ‘pure presence’ through theatre, to eliminate all representation and ‘access human truths,’ if one follows Derrida’s logic, is not possible or desirable since pure presence is outside time and therefore equals death. Derrida argues that every known thing is relational and the result of ‘differance,’ defined by what it is not rather than by an essential nature. The present moment itself cannot be grasped, there is never a now that can be restrained and held. The present always contains a mark of the past, at the same time as it allows itself to be invalidated by the mark of its relationship to the future. Difference is indeterminable and therefore meaning arises from something that is not present. The present moment can similarly not be apprehended. Derrida terms this non-presence ‘differance.’ He argues that full presence cannot be reached because no instant can exist outside of time; the present has disappeared before it has made an appearance. Signs are present in the absence of the things they signify. The sign represents the present in its absence.

The concept of ‘differance’ is important here as it helps us understand why traditional theatre has excluded the use of projected media. Many of the practitioners I have mentioned demonstrate a strong desire for various forms of theatrical presence. This desire is not limited to proponents of dramatic theatre and can be found in contemporary and postmodern theatrical discourse. Live art, for example, is a form of contemporary performance that, it could be argued, craves presence. I am interested to examine the assumption that any theatre or performance can ‘make present the present moment.’ More often than not, the desire for presence dismisses the use of technology because it imagines that technology contaminates the live actor: the conduit through which it is assumed full presence can be reached. Technology’s use in theatre can bring into question claims of presence. It can disturb the assumption that presence is attainable, by making evident the fictional illusion; in juxtaposition with the actor it undermines the notion that theatre is a site of literal presence; and it can intrude on the actor’s

charisma or aura. Most threatening about technology in theatre, is that it questions theatre's claims to 'a mystery called the present moment.'

A number of prominent commentators, such as Philip Auslander and Elinor Fuchs, have put forward that deconstructing theatre's illusion of presence is essential in order to demystify theatrical representation. I would argue that beyond deconstruction and demystification, theatre practitioners aware of the historical reach for presence can enable a more conscious play of both the audiences' and the actors' notions of presence. Auslander and Fuchs have been important in using Derrida's analysis to understand prejudices and assumptions in traditional theatre, but to a large extent we have gone beyond the need to make evident theatre's privileging of presence through the work. Cormac Power provides a comprehensive critique of theatrical presence. He defines theatrical presence in three distinct modes; the "fictional mode" of making present the fictional world of the play; the "auratic mode" of actors having presence as charisma; and the "literal mode" of actors being-present literally with an audience (co-presence). These modes are very useful to help us understand theatrical presence with a number of different aspects, and perhaps when we understand how these compete with one another then we will have the capacity "to explore and 'play' with notions of presence." [11] Power's main thesis is critical to this study: if theatre highlights that it is "part of a mediatic system" rather than claiming to be a privileged site of "unmediated 'nowness,'" (through literal, auratic or fictional presence), then theatre can realise its potential to show how the "(im)mediate" is itself "mediated." [12]

With emerging digital technologies, the notion of literal co-presence has had to be redefined. Until recently, most definitions of liveness referred to Auslander's binary opposition of 'live' and 'mediatized,' live only being understood since mediatization became a possibility. With the emergence of digital technologies, Auslander has had to redefine this notion of live. Speaking at the recent Transmediale 11 conference in Berlin, Auslander describes his new definition:

Liveness is no longer defined as presence of physical persons in front of each other or physical and temporal relationships. The audience's experience is now the locus of liveness. Digital liveness emerges as a specific relation between self and other. Our conscious act at grasping virtual acts as live in response to the claims they make upon us. [13]

The positioning of the audience as the test for liveness has created some controversy. In 2002, Auslander published a provocative paper about chatterbots, which prompted a number of responses. The crux of Auslander's argument was that, "The chatterbot forces the discussion of liveness to be reframed as a discussion of the ontology of the performer rather than of the performance." [14] He made this claim because the internet chatterbot performs live according to one of the Oxford English Dictionary's definitions of live, "Of a performance, heard or watched at the time of its occurrence, as distinguished from one recorded on film, tape, etc." [15] The Internet chatterbots are performers themselves, Auslander says, because they create their performance at the same time as we witness them. This proposition suggests that a live performance is no longer determined by the performer as live person, and therefore removes performance as a specifically human activity. Liveness, Auslander claims, is now determined by the audience 'being there,' rather than the performer. This notion that liveness is not dependant on the performer, but on the audience/viewer is important when we investigate further the relationship between projected media and its uses in theatre. Would we consider a work to be live if all the actors were avatars operated in real time, but not literally present, for example?

In a theatre that privileges the actors' literal and auratic presence, where the spoken words of a text are used to make present a fictional world, projected media has often been viewed as contamination. Having posed that presence is threatened by technology in theatre, I now want to look at a specific example of my own work that further problematizes this privileging.

Exception is a performance that uses the multi-user online virtual world, Second Life, as both metaphor and tool for performance. As a metaphor, Second Life functions as literal 'second life' for asylum seekers lucky enough to be offered a permanent home there; as a site for performance, one actor on stage interacts with avatars projected and operated (mostly) live from Second Life. The show is currently in its third stage of development in Melbourne, Australia. During the first stage, we proposed three possible interactions between actor and avatars; (1) Avatars (including an avatar of the actor), operated live by on-stage actors who manipulate the avatar movements visibly at workstations, voicing them from on-stage; (2) Actor interacting with pre recorded avatars including pre-recorded voice; (3) The capacity for live and remote audiences to interact as avatars in Second Life, projected into the theatrical space.

The desire to bring Second Life into theatrical space is a desire to 'make present' what is not present: a virtual world. Avatars are 'given life' by their scale of projection, method of voicing and dimensionality. Theatre however, has arguably always attempted to 'make present' that which has not been before it. Making Second Life avatars present in a three dimensional space is therefore not structurally different to any of theatre's other endeavors. My bias for theatre over virtual worlds demonstrates a privileging of presence on my part.

The actor onstage in *Exception* is immersed in an entirely animated projection world. All settings and characters are created from the crude two-dimensional animation that is the Second Life aesthetic. The argument that projections overwhelm live bodies is challenged when the actor is immersed inside the projections in this way. It is a common perception that projections overwhelm the live actor because of the dominance of the screened image. While this view may be true in specific performances, it is not a given that projections overwhelm live bodies. In the case of *Exception*, the immersion of one actor amidst an entirely animated world framed his liveness. It was impossible not to see him first. Rather than overwhelm the body, projection integrated with the actor and blurred the distinction between organic and mediated. In this way, the juxtaposition of actor and animation can make liveness more prevalent. The animations in *Exception* made no claim to being real. One actor immersed in an animation world enhanced the actor's auratic presence while at the same time challenging its power.

Another trope of dramatic theatre: an emphasis on empathy and identification, is challenged when most of the characters on stage are digital. Empathy has been well critiqued by Brecht in the last century who defined his epic theatre as the elimination of empathy and imitation. Brecht felt that film lends itself to "a type of drama not depending on empathy," and for the audience, he claimed that the use of projections in theatre "prevent[s] his complete empathy, interrupt[s] his being automatically carried away." [16] Brecht was significant in identifying traditional theatre's reliance on empathy and imitation and attempting to dislocate this but, as Auslander noted, Brecht's conception of the role of the actor was also based in the metaphysics of presence. Andre Bazin, amongst others, have refuted Brecht's claim that audiences do not empathize with the screen, however Brecht's claim that juxtaposition of projection on stage can prevent complete empathy, is relevant to this paper. Patrice Pavis defines identification as a "process of *illusion* whereby the spectator imagines himself to be the character represented and the actor gets right 'into the skin' of the character." [17] In *Exception*, through the juxtaposition of actor with projection, a level of estrangement occurred. The audience was brought closer to the actor's aliveness because the actor was surrounded by non-living entities: the animated avatars. Their otherness signaled

the actor's aliveness. The capacity for empathy was not affected, success of a closed fictional world to engage the audience's care factor remained the same whether projections were used or not. Dependent on the success of the closed fictional world, dramatic theatre's desire to create empathy in an audience can still be achieved. However, Brecht's objective to estrange the audience can also be enabled by using the projections to interrupt our identification with the living actor/character and reflect upon the fictional illusion made present. The argument that audience cannot empathize with projected characters ignores the capacity of projection to enhance empathy with the actor/character by framing the actor's liveness. 'Cyborg theatres' like *Exception* have the capacity to enhance empathy and identification, while at the same time enabling a kind of 'verfremdungs effekt.'

From its inception, *Exception* was conceived as a project that would enable interactivity from live or remote audience members via their avatars in the Second Life world. The idea being that the auratic present actor would engage in a three-way interaction with the two-dimensional avatar objects that could be operated by either audience or on-stage operator. This would enable real time interventions into the apparently closed fictional world that the piece otherwise constructs. Prior to showing the work-in-progress to an invited audience, we staged an in-world interactive exercise, which would feed this capacity for live intervention. One of our sets was a detention centre, created in Second Life. We placed our main character's avatar, Asim, in the virtual facility and publicized the fiction that Second Life had detained him. We had anarchists and communists from all over the world attempting to break Asim out (which they achieved quite easily). After sometime, with varied reactions, we enlisted a few of our more engaged rescuers to 'perform' in a live showing. During the section where our onstage actor and his avatar were locked in Second Life detention, the anarchists were to rescue our avatar, but of course our on-stage actor remained behind bars.

The participatory capabilities of *Exception* have not been explored to their full potential, but in an effort to engage the audience's awareness of their presence, we are moving the work to function as a game, giving the audience agency in the creation of the work. Already *Exception* plays with the actor's auratic presence by immersing him in an animation world and introducing avatars as 'live' animated characters. Now we propose to interrupt the fictional world by enabling further audience interaction.

In *Exception*, 2D animations are 'made present' through live interaction, operated and voiced in real time. This unsettles the notion of theatre as the privileged site of literal presence. The actor's auratic presence is challenged by juxtaposition with life sized animated characters; and by enabling audience's participation, the fictional world made-present is challenged. At the end of the day, *Exception* is no different from any piece of theatre that attempts to make present that which did not exist before it. However, *Exception* does this in such a way that the different modes of theatrical presence – literal, auratic and fictional – are identified as mediated and their competition with one another enables an enhanced awareness of liveness.

I have not resolved the problem of the privileging of presence in digital and participatory performance but through the development of *Exception*, my thinking has changed. By making this work, I have discovered that the ancient tradition of theatre can offer a rethinking of fundamental notions of presence to contemporary forms that engage with electronic arts. Far from attacking the metaphysics of presence, I seek a way to move forward between conditions of possibility and impossibility.

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ALGORITHMS AS STRUCTURAL METAPHORS: REFLECTIONS ON THE DIGITAL-CULTURAL FEEDBACK LOOP

Romy Achituv

Through a series of illustrated examples this article purports to show how the application of digital — algorithmic — paradigms to analog media may illuminate values and perceptions inherent in the digital models themselves.



Fig 1. R.E.M. Imitation of life music video freeze-frames



Fig 2. Fan Kuan, Travelers amid Mountains and Streams, National Palace Museum, Taipei



Fig 3. History stickers (Mandarin, English, Bengal), and emotional categories stickers (English, Nepalese, Mandarin)

The following excerpt from the full-length article focuses on three examples: an R.E.M. music video and two art projects co-authored by the writer. An extended discussion of metaphor, cognitive paradigms and perception, which establishes a theoretical background to the given examples, has been omitted for lack of space, as have most of the footnotes and images. The text has been edited for continuity.

*

In 2001, the American rock band R.E.M. produced an intriguingly “economical” music video for their song Imitation of Life [1]: a four-minute clip of an elaborate and densely populated pool party, pieced together from a single, stationary, twenty-second long shot. A virtual camera wanders through the scene, zooming in and out to focus on different vignettes while the source clip loops continuously back and forth. [2]

The short duration of the single shot and its looped unfurling and recoiling divorce it from its linear cinematic substrate and transform it into a pictorial, a-temporal, medium perhaps more akin to a kinetic picture, i.e. a picture with moving parts. Were we to view the source clip alone running back and forth unedited, we would be unlikely to experience it as passively as we would do, a cinematic narrative. Rather, we would actively explore its pictorial-scape, tracing our own paths through the crowded scene, choosing the vignettes we wished to focus on and the duration of our engagement with them. We might begin with a close-up of a woman bidding a fond farewell to her older partner only to turn and run into the arms of another, zoom out and refocus our eyes on a man set ablaze by a barbecue fire, then shift our spatial orientation, perspective, and attention to a group seated around a table presided over by a woman whose monologue is cut off only as another empties a glass of water in her face, and so on.

The cinematic experience of the R.E.M. video is rendered, not through the narrative of the twenty-second shot, but rather through the (meta-) narrative imposed by the sequential stringing together of selected vignettes. The edited video offers one possible narrative path, simulating the wandering eye of a viewer exploring the a-temporal scene.

The iterative spatial and temporal reframing of segments of the video clip might be described as a perpetual resampling of the video “database,” analogous to the process of random access whereby computers retrieve arbitrary data directly, without the need to sequence through prior locations. If the random access metaphor seems apt, it is because we recognize in it a freedom that we associate not only with the nature of human perception, but also with cognition itself. The eye’s capacity to wander the visual landscape of R.E.M.’s pool party is intimately connected with our sense of agency and freedom of choice.

The dynamic and multifarious nature of perception has long been embodied in traditional East Asian painting. Unhampered by the convention of single-point perspective, Asian paintings often depict scenes that combine multiple perspectives within one composition. The viewer’s eye is made to wander in, out, and across the picture plane, alternating between grasping the composition as a whole and focusing in on details. Transitioning through scenes presented from multiple vantage points, the viewer constructs a multi-dimensional mental image of the depicted world. A peasant trailing a caravan of donkeys viewed from afar and above, for example, may appear at the foot of mountains which themselves are painted at eye level, and which may, in turn, be seen in the foreground of great cliffs viewed up close and from below. Mimicking human perception itself, the multiple scenes, each assigned an idiosyncratic perspective, appear to exist in a single harmonious space.

Similarly, as it wanders through the looped visual time capsule of the R.E.M. video, the virtual camera offers reframed vignettes for our mind’s eye to assemble into a coherent whole. The video thus offers a representational model that evokes, at one and the same time, the manifold perspectives that harmoniously coalesce in the traditional Oriental painting, the mechanism of random access data retrieval, and the perpetually shifting focal points and fields of vision that characterize the free dynamics of human perception.

*

French phenomenologist Maurice Merleau-Ponty died in 1961, almost thirty years before the dawn of Photoshop. “When the data of the world is subjected to coherent deformation,” earlier that same year he wrote, “meaning is always present.” [3]

Merleau-Ponty’s characterization of experience as malleable data to be acted upon rings surprisingly contemporary, as it conjures up a world that can be accessed by means of algorithmic computation. Merleau-Ponty’s view corresponds to western ideals of artistic expression that have, since the early Renaissance, exalted the creative vision of the individual artist. Indeed, Modernism strongly endorses the notion that what constitutes the particular creative vision of an artist or artistic movement is expressed through their idiosyncratic, yet coherent, representations of reality. In other words, it is the coherent de- and re-formation of reality that we commonly refer to as the expressive quality of a given work identifying in it the artist’s conceptions, emotions, and ways of seeing, or in short, its meaning.

Present day technology forces us to reexamine Merleau-Ponty’s analysis of the provenance of “meaning.” We need only consider the multitude of preset filters packaged with standard media editing tools, such as Photoshop and After Effects, to realize that these programs provide their users with a host of automated procedures for fabricating “coherent deformations.” However, does the rote application of a graphic filter necessarily produce meaningful expression in the altered image?

It might be argued that the meaning inherent in the application of a standard filter is the effect of the distortion itself. Thus, the meaning of a Gaussian Blur filter, for example, would be the blurriness of the affected image. However, we are only able to attribute meaning to the Blur filter due to a shared convention about what “blurriness” denotes. It is not the automated distortion; that imbues the image with meaning, but rather our perception of it.

Whether our perceptions are cognitive models grounded in convention (such as when we interpret the meaning of standard image filters), or formed in response to an artist’s singular idiosyncratic vision, they acquire meaning by virtue of their relationship to their object of contemplation—that is, by virtue of intentionality without, intentionality meaning would remain indeterminate.

According to the Sapir-Whorf hypothesis, the cognitive structures fashioning the meanings we assign to a given image or utterance in everyday discourse are generally indiscernible as they constitute a seamless part of our perception. We become cognizant of these structures when ruptures occur in our cognitive “fields of view.” These ruptures may be caused by internal sources, such as a sense of dissonance that rises to the level of awareness, or by external sources, such as an alternative paradigm that challenges our perceptions.

Art practice is a distinct arena where such challenges take place by design. “Dissonances” are introduced into artworks through “intentional coherent deformations” that are meant to draw attention to the structures of expression as much as to the content. In the words of Lev Manovich: “In art, the connection between content and [form] is motivated,” [4] and “just as modern thinkers, from Wharf to Derrida, insisted on the [opacity] of code idea, modern artists assumed that content and form cannot be separated.” [5] Consequently, the critical focus of modernism has been no less about the forms of expression than about the subject matter itself, often collapsing one into the other.

If the formal characteristics of an artwork shape its content, it can be said to render visible its structural code. While some elements of the code may be idiosyncratic, reflecting the singular vision of the creator, others are necessarily normative, relying on established convention. In either case, the code is made visible through the intentional analysis of its semantic value. Modern art is, therefore, a unique investigative space for exploring the structural determinants that underlie our conventions of representation and the semantic readings they dictate.

Viewed from this perspective, R.E.M.’s *Imitation of Life* video can be said to assign meaning to the navigational structure of the piece, i.e., to its non-linear “coherent deformation” of time and space—a reading which reveals characteristics of the code that otherwise might have remained opaque. Below are two examples of art projects that introduce digitally-inspired structural paradigms into physical interfaces, thereby capitalizing on the metaphoric potential of intentional coherent deformation.

The Garden Library

<http://www.thegardenlibrary.org> [6]

The Garden Library is an open-air structure situated in the heart of a public park in the center of Tel Aviv. Established in 2009 to serve the community of refugees and migrant workers who congregate in the park on weekends, the library has no walls or door and is comprised solely of two bookcases supported by the walls of a public shelter. It contains approximately 3,500 books in 16 languages.

ARTEAM, the artists' collective that initiated and produced the library sought to break away from traditional categories of classification and to realize a sorting and indexing system that would playfully manifest the values of an open society. Accordingly, the books are not catalogued according to genre or author name, but dynamically, according to reader input.

On the inside back cover of each book is a sticker that asks, "How would you describe the book?" and offers seven emotional responses the book may evoke: amusing, boring, bizarre, depressing, exciting, inspiring, sentimental.

When returning a book, the reader is asked to choose the fitting emotional descriptor, and the color-coded judgment is added to the history of responses on the spine of the book. The book is then placed on the shelves according to its latest emotional classification. In other words, the placement of the book is not decided by popular vote, but by the last reader, using a dynamic system that everyone can impact and in which every participant's input counts. The cataloguing system constantly restructures the layout of the book collection, creating at any given point in time a transient "wandering map" that reflects the readers' opinions and preferences.

ARTEAM thus sought to apply the non-linear algorithmic logic of digital technologies to the physical holdings of the library, transforming the book collection itself into a database that is continuously restructured on the basis of user input. The cross-disciplinary application of the algorithmic procedure to the library's physical collection directs attention to the structure of the cataloguing system itself. The system transforms the library into a small, parallel world where the books wander between the shelves as their readers wander the world, carrying with them their emotional history.

Hall of Memory – Ghetto Fighters' House, Israel

<http://m--a--p.net/yizkor/Yizkor.htm> [7]

The Ghetto Fighters' House Museum commemorates Jewish resistance during World War II. Founded in 1949 by a community of Holocaust survivors and former members of the Jewish underground and partisan units, it was the world's first Holocaust museum.

In 2007, the museum inaugurated a new Hall of Memory, designed to allow visitors direct access to archival material. Glass walls form the rear panel of the archive drawers, and visitors are invited to choose the drawers they wish to illuminate by touching blue light indicators on the glass panes. Touch-activated interfaces located behind the glass panes provide access to information about each item.

The designers sought to make available to the public the memories contained within the artifacts, enabling free access to the physical legacy of the country, its people, and its history. As in many traditional archives, these "semantic building blocks" of the historical narrative had previously been guarded as national treasures, open only to researchers and curators.

The multiple paths, which visitors can trace through the archives, echo the multi-thread non-linear structure of parallel computing. Indeed, the digital model was not only the initial inspiration for the design of the archive experience but is also integral to its symbolic reading. By transferring responsibility from the institution to the individual, the open archive democratizes the historical narrative. Each visitor

becomes as it were a curator, entrusted with the task of determining their own path through the physical “database” of historical memorabilia.

The archive occupies two adjoining sides of the hall, with a large-scale generative installation on a third wall. The installation cycles through over 4500 names of Jewish communities that existed before the war. The names are formed from letters that float up from a rubble-like base, pausing momentarily to assemble into a name, and then immediately breaking apart again.

The fragmentary and individual sampling of the database of names formally echoes the visitors’ experience of navigating the museum archive. At the same time, the installation symbolically complements the archive by reflecting the notion that the viewer is responsible for sustaining historical memory. As each name falls apart, its memory lingers on only in the mind of the beholder.

Conclusion

George Lakoff and Mark Johnson’s Cognitive Theory of Metaphor has had a seminal impact on the perception of metaphor in contemporary semantics. Once looked upon simply as a linguistic or literary device, metaphor is now regarded as a conceptual mechanism. Lakoff conceptualizes metaphor as a cross-domain mapping, [8] namely, “a cognitive mechanism whereby one experiential domain is partially ‘mapped’, i.e., projected, onto a different experiential domain so that the second domain is partially understood in terms of the first one.” [9,10] Any yet, while the projected domain is intended to elucidate the target domain, metaphor is self-reflexive: it cannot help but draw attention to those characteristics of the original domain we “intuitively” perceive to be relevant.

In this sense, the R.E.M. video, which metaphorically applies the logic of a random access database, employs a representational paradigm that structures our interpretation of the video while simultaneously providing a context for a semantic reading of random access itself. Similarly, the cataloguing system of the Garden Library and the open archive of the Ghetto Fighters’ Museum are symbolic systems that imbue the projects with meaning while acting as interpretive models, which they borrow, from the digital algorithmic structures.

Such cross-disciplinary mapping from the digital to the physical sheds an intriguing light on aspects of the feedback loop between culture and the technologies it engenders. When they appear in a work of art, these metaphorical structures illuminate the cognitive constructs and values that digital technologies are introducing into our lives, perhaps representing a means by which the non-transparency of the digital code may become a little less opaque.

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This paper was supported by the World Class University program funded by the Korean Ministry of Education, Science and Technology through the National Research Foundation of Korea (R32-20067).

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CORPOREAL_EXPRESSIONS: TRACING BOTH BIOMEDICAL AND EMOTIONAL LINKS FROM AN ARTISTIC PERSPECTIVE

PATRICIA ADAMS

What issues are involved in 21st century representations of corporeality from an artistic perspective? What parameters and methodologies are required when contemporary biotechnology and neuroscience are rapidly changing the ways we see ourselves and actively remodeling the human body? These questions drive my research and have formed the basis of my art/science practice and my investigations into both the biotechnical and virtual domains

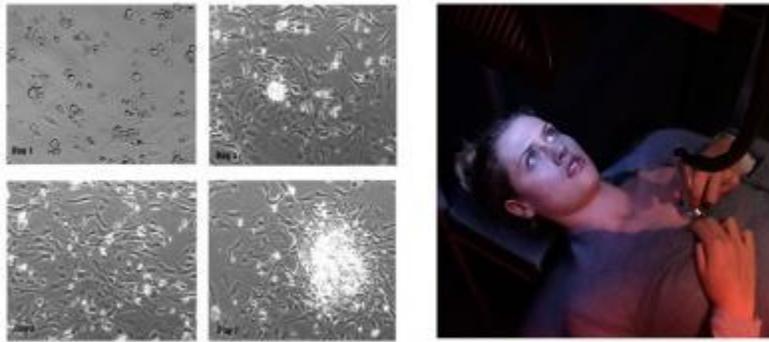


Fig 1 machina carnis, 2005, composite digital image showing adult stem cells changing into cardiac cells & an installation participant using the modified stoscope. © Trish Adams



Fig 2 Changing Fates matrilineal, 2009, digital video still. © Trish Adams



Fig 3 mellifera, 2009, in-world shot of Neurone Schism, a.k.a. Trish Adams, Essential Beeswing & Nonnatus Korhonen, a.k.a. Andrew Burrell. © Trish Adams

INTRODUCTION

This survey of my art/science research practice traces my experimental methodologies and considers my hybrid, interdisciplinary explorations into the nature of corporeality. It illustrates how my artistic reinterpretations of scientific experimental data led to the creation of artworks that implicate the viewer as a participant who can evaluate the socio-cultural issues raised by contemporary biotech research. Recontextualising scientific data in interactive artworks and placing installation viewers in a participatory role offers an alternative experience to that of direct laboratory engagement.

Whilst escalating levels of scientific disciplinary constraints impacted upon my art/science research processes, my observations and data interpretations deliberately maintained an acknowledged artistic focus. My artworks: “machina carnis”, “Changing Fates_matrilineal” and “mellifera” are introduced here to illustrate how I reinterpreted what is commonly termed ‘hard’ scientific research from the perspective of a visual artist. I introduced a sensual reading of the scientific experience, which resonated with the reintroduction of the Baroque aesthetic, so long rejected in favor of literate understanding and reason:

“(i)t is precisely the baroque’s subversion of the dominant visual order of scientific reason that makes it so attractive in our postmodern age...in its disparagement of lucid clarity and essential form, baroque vision celebrated instead the confusing interplay of form and chaos, surface and depth, transparency and obscurity.” [1]

My personal interpretations and responses have been paramount when developing hybrid spaces, and open-ended methodologies and during my innovative art/science research four fundamental questions arose:

1. What will occur if a visual artist engages with biomedical engineering as a first-person researcher?
2. Can two customarily divergent disciplines create hybrid spaces where artists can interrogate science?

3. How might an artist represent 'corporeality' at the beginning of the twenty first century?
4. What constitutes 'humanness' when both contemporary biotechnology and digital systems are rapidly changing the ways we see ourselves and actively remodeling the human body?

MACHINA CARNIS

The “machina carnis” project involved working in collaboration with a biomedical scientist, Dr. Victor Nurcombe. I was arguably the first artist to experiment on her own adult stem cells and change them into beating cardiac cells in the laboratory. [2] In these experiments, I contravened accepted scientific protocols by assuming the role of a ‘human guinea pig’ and carrying out my research in the first person on my own cells. The University ethics committee considered this a problematic methodology. They were concerned that, from a hygiene perspective, there could be a danger of transmitting life-threatening diseases when unscreened human material is put into equipment and cultured in the laboratory. Also, following the repercussions of the landmark He La case, [3] they had to take into account complex moral and ethical issues in the areas of social values and ownership. A first-person methodology was crucial to my research focus in spite of these problems. My commitment to a first person approach was based on the belief that it would increase empathy between the viewer/participants and the artworks and enable me to be more deeply immersed in the project. In the words of my scientific collaborator, Dr. Nurcombe:

“(y)ou have entered into the heart of a research project as a core participant. You were at once subject and object, (experimenting on) your very “ground-state” – your own material.” [4]

Eventually the University ethics committee granted clearance to the “machina carnis” adult stem cell experiments, and we could begin. The ensuing “machina carnis” artwork encouraged individual emotional responses from gallery goers that in some ways mirrored the intensity of my own reactions during the scientific experimental processes. The installation was interactive and placed the viewer in the position of a participant who brought the work to life through their individual engagement whilst evaluating the contemporary biomedical and socio-cultural issues it raised.

Creating art/science collaborations that interrogate scientific research and open channels of inquiry in the public domain lead to my second question: what meaningful criteria facilitate the establishment of art/science collaborations in the first place? Cross – disciplinarity is complicated by the fact that art and science have become increasingly polarized by the specialist techniques now inherent in cutting edge science. This division began after the age of natural philosophy when the disciplines of art and science diverged in the early modern era. [5] This separation means that, for an artist who intends to collaborate with a scientist, doubts about the possibilities of a significant engagement between a scientific specialist and a visual artist are bound to arise. However various collaborative models are developing. For example, Professor of Digital Media Art, Joel Slayton suggests that constructive links occur when artistic collaborations expand upon aspects of research in unexpected ways: “...although art and science share many characteristics, a special role for the arts exists in the evolution and deployment of technology – the implication being that by operating outside the conventions of traditional practice, unique and significant research enterprises can and will unfold.” [6] In cases such as my own, spaces for an artist arise when the exploratory collaborative methodologies are adaptable and malleable enough to be opened up and create a different type of research dynamic. Once again I cite Dr. Nurcombe:

“(our collaboration) could only really be considered as “research” as I understand it, at a much more esoteric level; I would have thought we set out to do something quite “other”, something more open-ended. Research with other scientists is usually extremely focused and conducted within tight parameters; it’s not about possibilities so much as progressively excluding as many possibilities as possible. Our work was conducted much more in the spirit of “what if?” [7]

In other words, our art/science research methodology produced a hybrid entity which did not aim to mimic hard scientific research; rather it harked back to the cross disciplinary fluidity typified by the natural philosophers and, in doing so, allowed for the merging of different perspectives and the creation of organic outcomes.

The third question raised in this paper refers to twenty-first century representations of corporeality. In the "machina carnis" project, I explored scientific data from the perspective of a visual artist and acknowledged its corporeal origins. From the start of the laboratory experiments, I declared my partiality, and I clearly stated that I was making no attempt to emulate customary scientific claims to objective data readings. When I held my own cells in a Petri dish I did not document their behavior outside my body in a clinical way, I responded personally to the impact of this experience. Likewise, I regarded the time-lapse videomicrograph cellular image data, from my experiments, as more than a form of scientific documentary photography. With its intimate human origins and corporeal associations, this cellular image data was emotionally evocative and tactile. Professor Geoffrey Batchen refers to the semiotician, Charles Peirce’s definition of “contiguity.” Peirce states that contiguity was the indefinable dimension that was a focus of enquiry for the philosopher and theorist, Roland Barthes:

“Photography has never provided us with the truthful appearance of things, but it has guaranteed, through the magic of contiguity, the possibility of an emotional empathy across an otherwise insurmountable abyss...” [8]

I propose that closeness and emotional empathy was generated between my cellular image data and installation viewers. This cellular image data still carried a symbolic residue of my bodily presence, which in turn created an affinity with the viewers since it bore a metonymic relationship to their own cells.

CHANGING FATES

‘Changing fates’ is the term used by scientists to describe the ground-breaking process of chemically redirecting the growth of adult stem cells into a different type of cell. The artwork: “Changing Fates_matriilineal” expanded upon this research. It explored aspects of corporeality at the interstices between personal experiences and the symbolic traces embedded in the remediated cellular digital videomicrograph image data. The work included my adult stem cell digital videomicrograph image data and introduced the discourse surrounding mitochondrial DNA (mtDNA) and the female role played in genetic inheritance. My interest in mtDNA began when I read geneticist Brian Sykes’ description of new, more accurate sequencing techniques that have enabled him to take DNA directly from bone rather than inferring its structure from amino-acids in collagen. These increasingly advanced sequencing processes have led to the formulation of Sykes’ controversial theories that trace heredity via mtDNA. [9] Everyone gets their mitochondria from only 1 parent: their mother. For Sykes, MtDNA thus becomes a matrilineal indexical marker which, if the line of related women is unbroken, can survive through the female side from generation to generation. This mtDNA theory stimulated my curiosity about the underlying configuration of my biological relationship to my grandmother

Fig. 2 shows a photograph of my grandmother as a young woman. This is juxtaposed with a contemporary scientific digital videomicrograph still image of cellular data from my “machina carnis” laboratory experiments. I suggest that both these images carry residues of physical presence and form different types of portraits. However, this proposition is complicated by the fact that my adult stem cells have been changed in the laboratory into a different type of cell – the cardiac cells pictured – rendering their relationship to me physically ambiguous. Contemporary biotechnology has introduced layers of speculation and uncertainty into other corporeal connections.

CORPOREALITY

The final question presented in this paper considers our changing understanding of ‘humanness’ at a time when biotechnology is remodeling the human body and digital technologies offer us avatar selves in virtual domains. I was interested in the way a virtual environment might impact on my sense of self and my understanding of corporeality. With artist/researcher, Dr. Andrew Burrell I created the “mellifera” project that explored corporeality and identity in virtual worlds. “Mellifera” was a mixed reality project which included both real-time and virtual sites and a variety of participatory tropes in gallery spaces and on line. It drew poetic inspiration from direct research and observations of honey bee behaviors with Professor Mandyam Srinivasan’s Visual and Sensory Neuroscience Group, Queensland Brain Institute, The University of Queensland (UQ). The “terra.mellifera” virtual environment was constructed in Second Life® (SL) and was home to self generating life forms and an imaginary species of virtual bee, known as ‘mellifera.’ This was my first experience of SL, and I found that whilst my avatar was, as far as I know, a digital representation of myself inworld; I invested her with the emotional and physical characteristics of my real world corporeal self. Consequently, when anthropologist and SL researcher, Tom Boellstorff suggests “virtual embodiment is predicated on a discontinuity, the gap between virtual and actual,” [10] I take this as implying that an opening out of our scientific and philosophical frameworks is required to incorporate expanded constructs of ‘humanness’, the nature of living organisms and the impact of recent digital technologies on these reconfigured categories.

OTHER BEINGS

The extensive body of research on posthuman entities and actors that are not human paves the way for expanded notions of ‘self’ and ‘other’. Consciousness Professor, Donna Haraway pursues her ongoing entanglements of species and states:

“(f)or many years I have written from the belly of powerful figures such as cyborgs, monkeys and apes, oncomice, and, more recently, dogs. In every case, the figures are at the same time creatures of imagined possibility and creatures of fierce and ordinary reality.” [11]

Media theorist, Jussi Parikka discusses the history of etymological studies and highlights the contemporary relevance of pioneering ethological research. Parikka outlines the possibilities that insects and other nonhuman animals offer for rethinking media and for challenging our views of the natural and the artificial. [12] This research resonates with the corporeal complexities evoked by developments in biotechnology and opens the door to an ongoing expansion of what Haraway terms the “Principal Others to Man.” [13] My recent residencies with the Visual and Sensory Neuroscience Group echo this research into inter-species links. At UQ, I experienced being in close proximity with honey bees in the largest indoor bee facility in Australia. I was initially surprised that, for most experiments in the bee facility, we did not wear protective clothing. In this space, honey bees and humans went about their business,

sometimes in contact each other and sometimes not. This unusual interspecies juxtaposition gave rise to my video: HOST (<http://vimeo.com/channels/115324#12708853>) for which bees were trained to come and eat from the palm of my hand. During my residency, I developed not only knowledge of the skills manifested by these amazing insects, but also an unexpected proximity to these 'non human others.'

SUMMARY

The art/science projects described here have all created layered networks of physical, emotional and sensory encounters. The research has involved cutting edge scientific technologies and the artworks have discretely featured the affective qualities of media technology. My innovative methodologies have traced both biomedical and emotional links from the perspective of a visual artist. Inserting a personal response into the reinterpretation and recontextualisation of the scientific data has enabled me to embrace contemporary theories about non-human 'others' and explore self and corporeality. Burgeoning virtual worlds and the newly discovered pluripotent characteristics of many adult stem cells have opened the door for potentially wide ranging changes to our physical structure. What once appeared immutably 'human' may no longer be so. In the artworks described here reflections on memory, emotion, materiality and ephemerality have been creatively interwoven with recontextualised and reinterpreted biomedical research. This has given rise to works that stimulate further debate as we strive to quantify our 'humanness' at the beginning of the twenty-first century.

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SHIVERING BOUNDARIES

PATRICIA ADAMS

My research explores the nature of corporeality in the biomedical sciences and queries the status of our “humanness” in the early the 21st century. I will discuss the intersections between art, biomedical science and honey bee research at the Queensland Brain Institute.



HOST, 2008, digital video still. © Trish Adams

INTRODUCTION

During laboratory experiments on my adult stem cells I felt that looking at my cells through the microscope was like looking into another world where I was able to make first-hand observations in a domain of non-human ‘others’. The characteristics of the cells, observed at a microscopic level, highlighted issues relating to corporeality, sentience and cellular ‘consciousness.’ With the aim of finding out more in this field, I became an artist in residence with Professor Mandyam Srinivasan at the Queensland Brain Institute (QBI.) [1] I observed experiments being carried out on the ‘cognitive’ capacities of the European honeybee’s small brain. In this paper I will discuss how the artworks: *machina carnis* and *HOST*, that developed out of my art/science collaborations, illustrate my research into the nature of ‘humanness’ and examine the ‘shivering boundaries’ between mind – body – self at first hand. [2] I will describe how the methodologies I employed created alternative ‘habitats’ by transferring cells from my body to other sites and then by entering into a different domain to carry out research amongst honeybees.

ORIGINS

When I discovered an abandoned kymograph, I traced the historical origins of this archaic machine for measuring physical and nervous impulses. [3] It inspired me to create art/science projects that referenced galvanics and nineteenth century experiments into electrical stimulation of tissue. I parodied early scientific attempts to quantify the human body that used the ‘new technologies’ of the day by such pioneers as Carlos Matteucci. [4] During this period, I read an article from a 1999 issue of the journal: *Science*, which declared that pluripotent adult stem cell research was the scientific ‘breakthrough’ of the year. [5] This article described how recent biomedical research into adult stem cells indicated that

some adult stem cells had the ability to become different kinds of cells. This ground breaking research resonated with my own explorations since it suggested potentials to fundamentally change the very structure of our bodies at a cellular level. In order to investigate this exciting theory I began my *machina carnis* project by collaborating with an adult stem cell research scientist: Dr. Victor Nurcombe.

MACHINA CARNIS

The *machina carnis* scientific process began when a doctor took a sample of my blood from which we could separate and culture the stem cells under laboratory conditions. After three days in culture, the drug 5'AZT was added to induce the adult stem cells to become distinctive, muscle-forming cells. At the same time a mixture of cardiac differentiating factors, with a proprietary molecule, were also added in order to change the undifferentiated stem cells into cardiac cells. In response to Dr. Nurcombe's unique chemical mix, the cells reproduced, matured and began to develop characteristics of heart cells. After the laboratory experiments were completed I reviewed the scientific image data and decontextualized it in the form of an interactive installation. My aim was to create a sensual reading of the scientific experience and draw each participant into an individual relationship with the *machina carnis* artwork. The installation employed open-ended methodologies, which encapsulated manipulable systems where the boundaries between the body and its environment were in a constant state of interplay and flux. Creating this type of permeable membrane between the artwork content and the individual participants reflected my own engagement with the scientific processes. My first-person research in the role of a human guinea pig had contravened accepted scientific protocols and exploded the customary tropes of scientific objectivity. By personalizing my engagement with both the experimental techniques and data, I aroused emotional links and raised questions about contemporary stem cell research and the status of our 'humanness' at the beginning of the twenty-first century.

CONSCIOUSNESS

I was motivated to find out more about cellular consciousness. I wanted to learn how the stem cells I had observed under the microscope might 'know' how to behave and interact with each other, so I moved from my collaborative project in the biomedical sciences to participate in research on the European honey bee. I became a visiting artist with Professor Srinivasan and the Visual and Sensory Neuroscience group at QBI. By studying the behavior and nervous systems of small insects, such as bees, Professor Srinivasan and his group are able to shed light on the cellular processes and functioning of larger brains such as our own. At QBI, I participated in experiments in the largest indoor bee facility in Australia. I had not realized that, in this unique space, we would walk amongst the bees without any protective clothing. From my perspective, after being conditioned to avoid contact with bees, this experience was a revelation. At first I was intimidated, and I felt vulnerable, but after a while I became entranced by the opportunity to engage in close proximity with these 'other beings;' to enter into aspects of their world.

NON-HUMAN OTHERS

In his recent book media theorist, Jussi Parikka gives examples of late nineteenth century ethnographers and twentieth century media theorists and ethologists who have described the spatial conditions of variation found in all sentient animals and entities. [6] I felt that, during my first hand research at the bee house, I was experiencing much of what Parikka discusses. In the bee house, the honeybees and human

beings went about their business side by side in their parallel operational spheres. Honeybees and humans were functioning independently but juxtaposed within the same habitat. I found this experience of intersecting domains a very powerful one. It became the underlying premise for my video: *HOST* where the honeybees were trained to fly down, land and eat honey from the palm of my hand. When the bees landed on my hand to eat, they entered into an unusual symbiosis with a human being – a poignant example of interspecies contiguity. In the video, my hand appears immense and, whilst the possibility of being stung renders me vulnerable, the bees also seem vulnerable as they stumble over this alien, fleshy terrain in search of food.

SUMMARY

During my research, considerations of inter-relational pathways and connections have encouraged me to move beyond customary categorizations and environments. I use the term: ‘shivering boundaries’ to describe the developing relational systems that evolved as I explored permeable membranes in both cellular and inter-species domains. The *machina carnis* and *HOST* projects demonstrate slippage between contemporary biomedical cellular research and current enquiries into non-human ‘others’ such as honeybees. In the light of my research, expressions and representations of corporeality embrace open-ended and interwoven territories that accommodate malleable, hybrid identities.

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URBAN ECOLOGIES: “IN THE CITY OF THE APIS QUEEN”

PATRICIA ADAMS & ANDREW BURRELL

This locative media project combines digital technologies, scientific research, artistic innovation and real-time interactivity. We discuss the urban migration of the European honeybee and networked activities in city environments. It develops a futuristic socio-cultural narrative and combines such diverse disciplines as visual arts, new media practice, literature, computer science and the biological sciences.



Through an expanded description of the media project, *mellifera* [1][2] the artists will explain their interdisciplinary concerns, research methodologies and the ways in which their approach lends itself to flexible, hybrid practices. They will outline potential strategies for moving on from *mellifera* to develop a locative media project: “In the City of the Apis Queen,” which will fall within the framework of contemporary urban ecologies.

The *mellifera* project consisted of an on-line interactive environment in Second Life (SL), which was linked to a complimentary series of real-time exhibitions in gallery and museum spaces. Central to this innovative, ecologically sensitive artwork was the artist's direct engagement with various aspects of bee behavior at Queensland Brain Institute, The University of Queensland (UQ); [3] where researchers investigate cognition, navigation and communications in the honey bee. The artist's poetic and scientific interactions with the bees inspired *mellifera*'s experimental series of human/computer interfaces. These provided modes of sensory delivery for both virtual and real-world participant interactivity. A primary rationale behind this project was the artist's desire to find interactive tropes and strategies that would provide artwork participants with an interface, which enabled them to seamlessly interact with the virtual environment. Adams and Burrell were conscious of the limitations presented by software systems such as SL, in particular the constraints inherent in its closed structure. Furthermore, they viewed it as one of the many tools at their disposal for creating a contemporary artwork that pushed boundaries. At that time it successfully enabled them to explore the issues raised in *mellifera* but it is no longer suited to their creative needs for subsequent projects such as “In the City of the Apis Queen.”

Adams and Burrell chose to collaborate on *mellifera* as a result of their shared interest in the self and its construction in physical and virtual environments. Consequently, through both metaphor and subjective

focus, their collaborative projects have shed light upon a wide range of themes relating to identity, narrative and corporeality. These works have both breached and bridged the spatial, physical and systemic aspects associated with virtual platforms and embodiment. *Terra.mellifera*, the *mellifera* SL virtual environment, consisted of a generated, balanced ecosystem that accommodated remote participation via avatars and responded to the interactive engagements of physically present participants. Following in the footsteps of the grand tourist and explorer – whose reports evoked new virtual worlds within the minds of their listeners – an exciting aspect of Adams and Burrell’s collaborative practice, for both themselves and their audience, has been the creation and exploration of parallel universes that evolve – generating realms within which to discover new frontiers. Through narrative and real time interactive technologies Adams and Burrell have created a hybrid physical/virtual space via technical & ecological interconnectivities, making analogies between the behaviors of humans and communities of honeybees that emphasize observations of interspecies links. [4]

The underlying code of the *terra.mellifera* environment investigated the complexity that can be obtained through the combination of less complex elements. Ultimately, the whole process was about the system, from which emerge the individual creatures and life forms. Rather than setting about creating an environment with fixed goals and outcomes, the artists proceed to create a spectrum of behaviors and processes that became inextricably linked with one another and which imparted their own identities and parameters upon each other from the ground up. A question that the artists consistently asked themselves throughout their creative collaboration was, what makes any new addition to the system an integral and logical part of the system, continually adding complexity to the whole? The artists did not want to recreate a bee in the virtual world. They were investigating creating a creature with aspects of ‘beeness’ that was very much a native of its virtual ecology.

Interest has been developing since the nineteenth century in insect communities, behaviors and social structures. [5] This has led to a recent focus on the relationship between etymology and networked media technologies, which has informed Adams and Burrell’s recent research. For the project – “In the City of the Apis Queen” – the artists will compare the relationships between urban ecologies and the behaviors of a community of European honeybees. The project combines such diverse disciplines as visual arts, new media practice, literature, computer and biological sciences to develop a futuristic socio-cultural narrative within a citywide networked space. The artists aim to generate a networked project consciousness that grows out of the recorded ‘energies’ of participant engagement and evolves to resemble a ‘hive-mind-whole’ artwork system. In the “Apis Queen” project other key areas of honeybee behavior, such as the building of a productive community, the need for aggressive responses and the role of the queen bee will inform the programming and construction of the artwork networked system. The whole work seeks to transcend conventional spatial boundaries; materially immersing participants in a very physical way .

Through the use of custom-made wearable devices that self organize into a local network and communicate with each other in real time, and a digitally programmed system of web portals aimed at mobile browsers, the artists will immerse participants in what is an essentially an open-ended system. These systems will both create, and highlight existing urban ecologies as networks. As part of this system, through a quasi-gaming structure, “Apis Queen” participants are provided with hand crafted network devices and invited to collaborate with one another. They become immersed within a network that forms as a result of this process; which then becomes part of the overall pre-existing network to create narrative data, which is native to it. This process leads to the local becoming global and the private, public. These networks will be temporary and exist only while participants are active. However, the data

that is created will be allowed to continue its evolution within a perpetual virtual environment accessible through a web portal. Reminiscent of the *mellifera* ethos, one might ask whether the artists are trying to uncover a networked mind or life form arising within this expanded ecology? Ultimately the “Apis Queen” project creates a space for the investigation of future narratives at the nexus of science fiction and everyday urban reality. This unique intervention into networked environments represents new explorations into uncharted territories of urban and data ecologies. The artists’ role as tourist and explorer of these new frontiers is an ongoing one, and as the interface between the physical and the virtual continually shifts, they will encounter many unknowns.

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NEW MEDIA ART INSTALLATIONS AS COGNITIVE SPACES: AN APPROACH FROM THE PERSPECTIVE OF DISTRIBUTED COGNITION

Josefina Lopez Aguayo

Do all artefacts hold the same cognitive load?

Are art installations, using new technologies, cognitive to the same extent as other spaces or technological artefacts?

New media art installations are not aimed at usability. They turn into artefacts that generate spaces where what has been produced is a result of the worldview of the artist

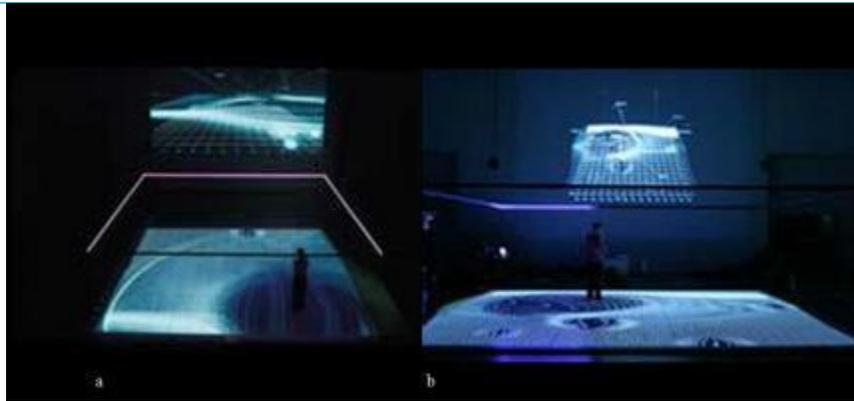


Fig 1. Gravicells - gravity and resistance. (2004) by Seiko Mikami & Sota Ichikawa realtime-interactive installation GPS system 6m x6m floor composed with sensors, transparent screens, projectors, speakers, computers © Seiko Mikami + Sota Ichikawa



De-Viewer (1992), Linz, Austria, by ART+COM. Rear projection display with infrared eye-tracking system, 100x60 cm. © ART+COM; Photos ART+COM

The theory of distributed cognition, developed formally by Hutchins and his colleagues, is a view of cognitive science which shares the idea that cognition is not situated in the thinking agent. By contrast, knowledge is regarded as a construction that emerges through contact with the artefacts to which people are related. According to this theory the person is an active not a passive agent, and it is also argued that spaces are spaces of distributed memory. On this basis one can infer a cognitive relationship between people and technology, where the latter refers to what human beings have produced as an extension of themselves. Consequently, cognitive artefacts can be understood as “physical objects made by humans for the purpose of aiding, enhancing, or improving cognition.” [1]

The present analysis seeks to distinguish between technological cognitive artefacts and cognitive technological art artefacts. We discuss whether all cognitive artefacts have the same properties in relation to the creation of cognition.

1. TOWARDS NEW MEDIA ART INSTALLATIONS AS A COGNITIVE WORLDVIEW

Over a decade ago Jan Greenberg and Gary Dickelman (2000) [2] argued that it was important to ask where and how knowledge is produced, rather than assuming that it is simply located in the head of the thinking agent. Since then the knowledge paradigm has shifted from a focus on the agent to a theory of distributed cognition, developed by authors such as Hutchins from the University of California, San Diego.

Hutchins’ [3] theory, which he terms ‘distributed cognition’, aims to explain the acquisition of knowledge by using a concept of extended cognition, one that goes beyond the corporal framework of an isolated agent, locating it instead in the environment that involves the agent. This environment, according to Hutchins, is organized by elements such as technological artefacts.

Because the theory of distributed cognition represents knowledge as being located between agents and the world, such knowledge is no longer in a certain place. Rather, it is distributed in a mediating space between agents and artefacts, producing interactions which are able to produce transformations in the agent’s state of knowledge. Hence, it can be argued that cognition takes place in the system, not in the head of the agent or in a precise spatial location.

In line with these ideas authors such as Marshall McLuhan [4] suggest that cultural instruments are “extensions of man,” which alludes to their power to extend human capacity. Similarly, David Kirsh [5] theorizes about “the intelligent use of space,” in which objects and the environment are cognitively structured in order to improve the agent’s capacity, conferring functions of cognitive and physical simplification to space. From this perspective, cognition does not depend on an isolated act of the agent, but rather is produced through interaction with the social and cultural environment. This is especially relevant in contexts that involve technological tools which imply cognitive capacity and can modify the agent’s environment.

However, not all environments or technological artefacts seem to have been designed to be used in the way that people tend to use them. [6] For example, imagine a house that was purchased for its particular orientation and large windows. This might lead us to think that the orientation and the windows serve to provide more hours of daylight or shade, which in turn are associated with financial savings and

personal comfort. However, the occupier could just as well use his home and its orientation to determine the time of the day by considering its relationship to the movement of the sun. In this sense, the functional aspect focused on this local use is more powerful, and illustrates how the functional value of artefacts is mobile and has different levels. [7]

At all events there are artistic spaces and artefacts whose cognitive nature diverges from this functional perspective. Rather than being determined by practical usability they are developed as socio-cultural spaces of knowledge whose ultimate 'function' lies in the possibility of extending somehow the mind of the interacting agent. Thus, the purpose of mental processes in this case is not the local use of the space or artefact but rather to expand the agent's experience.

Installations of this kind enable mental processes to be implicated in multiple ways when it comes to the development of knowledge. To put it another way, an installation using new technologies can lead to a cognitive state which has not been intended by its programmers, just as we have seen in the case of functional artefacts or spaces. Therefore, while they may show certain variability their application is not limited to a localized usability as a cognitive tool. For instance, a new media art installation might have been created for its aesthetic or entertainment value, but could become a place of associations and conceptual fusions which provides the inter-actor with experiences that are difficult to achieve.

Let us consider two examples in order to illustrate what is being proposed.

TWO EXAMPLES

A. GRAVICELLS - GRAVITY AND RESISTANCE

The first example concerns the Japanese research project *Gravicells - gravity and resistance*, by the artists Seiko Mikami and Sota Ichikawa (Yamaguchi Centre for Arts and Media (YCAM), 2004).

This is an installation in which the agents interact in a GPS space through body movements in real time. The installation consists of projected images and geometric information in the same space, one in which the inter-actors can experiment with their bodies. Their movements through the installation produce changes in the space [Figure 1: Gravity and other external forces are simulated in order to generate new ways of understanding gravity, starting from the experience of sensorimotor processes, aesthetics and the interaction of the body with the simulated environment.]

The installation becomes essentially cognitive on different levels, principally due to its capacity to generate a conceptual fusion which would be difficult to experience in the inter-actor's life. It comprises two 'inputs,' two spaces, with which a third space is created, integrating the first two spaces, thereby leading to a conceptual integration that enables the emergence of a new 'mental space.' [8]

1. The first 'input' is determined by an artistically developed technological space, which simulates time-space.
2. The second 'input' is generated by the static or moving images of the universe, which we are all familiar with.

This enables us:

1. To consciously experience, through sensorimotor processes and first hand, the simulation of a barely accessible aspect of space: zero gravity.
2. To become aware of the physical laws that establish the representation of space, based on a curved — not a flat — time-space continuum.

As stated above, this experience is produced by a conceptual fusion of two spaces or ‘inputs’ from which a third space arises. This allows the inter-actors to feel their movement as if they were each a celestial body, perceiving the geometric deformation as a consequence of their own displacements and body mass in the created space.

The author of this installation states the following:

“This work presents the dynamic processes of interaction between gravity and resistance. It was created after reflecting upon the overwhelming difference between everyday life space and the mass of the earth. It seeks to recompose gravity by reconsidering the dialogue between the body and space.”

However, the experience of this project cannot be reduced to this alone, to the instrumentalization or usability of the generated cognitive space. On the contrary, knowledge is integrated in the cognitive processes (mental and sensorimotor) of the agent. This is a consequence of the worldview of the programming artist or the research group, and not of any type of localized functionality.

B. DE-VIEWER

The second example is De-Viewer (1992), a project developed under commission by the company ART+COM. This shows a projection of a painting by Giovanni Francesco Caroto, the image of which is altered by the presence of the inter-actor and his/her viewing of the display [Figure 2, images a, b, c. (a) Installation of the system on the projected display; (b) Initial alteration of the process according to the visual action of the inter-actor; (c) Advanced alteration of the image due to the visual action of the inter-actor.]

The underlying technology is based on a system of eye-movement recognition. A computer is used to analyse the view of the inter-actor, calculating the coordinates of the viewpoint on the display. These coordinates are then sent to the graphics system, which alters the image as the viewpoint moves over the image. There can be no identical movement and, as a consequence, no identical alteration of the image. Once the inter-actor stops looking at the image, the alteration disappears and the image returns to its original state.

The artwork is presented in an open space where the agent/artefact relationship creates a hermeneutic environment. The experience of the artwork leads us to question the concept of reality without the presence of the perceiving agent and the very act of knowing. These aspects become evident when we perceive the effect of the visual action upon the perceived ‘object’. The view, seen as the action of the inter-actor, questions the notion of reality as something existing without the presence of the inter-actor. Furthermore, what is emphasized is knowledge based on inter-relationship within an organized system. This holistic emergence of knowledge comprises the relationship between the agent and his/her environment.

What this space does, therefore, is enable the agent to activate cognitive mechanisms with which to experience an abstract theory about reality, which was perhaps not the original idea behind this artwork.

According to its creators this art project was designed:

“... as a reaction to the general attitude to computers as tools rather than a medium, still prevalent at the end of the 1980s. (...) This installation was designed to promote one of the most crucial qualities of computers as a medium, their interactivity or mutual dialogue.”

By contrast, the experience of the work brings to the fore the following aspects:

1. The possibility to experience consciously the effect of our presence as a constructive element of reality, in this case through eye movement.
2. The awareness of the interdependence between the object of perception and the perceiver. Space emerges through the experience of enactive cognition [9] in relation to the phenomenon. The agent and the object/artefact are inseparable parts of the same given reality. Hermeneutic and semantic knowledge arises between the ‘other’ and the agent.
3. The modulation of consciousness in the course of evidencing the worldview — and artistic and cultural point of view — of the programming artist or research group. This aspect is related to the theory of constructing reality through the exhibition of artistic practice.

Thus, we are not dealing here with a functional artefact of mobile instrumental usability, but rather the worldview of the programming artist or research group as an extension of their mind. This is a worldview based on distributed cognition, one in which cognitive mechanisms — such as memory, metaphorical associations or conceptual fusions, sensory, cerebral or sensorimotor processes — produce a holistic mixture that enables the generation of extended and integrated cognitive spaces that endure in the mental structure of the agent.

2. TWO POSSIBLE CATEGORIZATIONS OF COGNITIVE SPACES OR ARTEFACTS

In light of what has been argued above it would seem important to clarify the concept of cognitive spaces or artefacts as used by Hutchins. [10] Our proposed way of doing this involves two categorizations. The first, or strong category, relates to the increased and permanent integration of new knowledge (of ideas) within the agent’s mental structures. This implies a different modulation of consciousness due to a worldview of cognitive artefacts or space that is neither functionalist nor instrumental.

The second or weak category is related to the priority given to the functional aspect of the artefact or space, which is situated and instrumental. Hence, this category is determined by the abilities which can be generated through the interaction with these artefacts or spaces and, as a consequence, in relation to their local usability and functionality.

In the earlier example of the home, knowledge could be defined as localized, as specific in regard to its usability. Therefore, once the possibility of interaction with the agent has disappeared, the tool that is able to optimize functionality also vanishes. This is not the case, however, of the two examples of art installations. This is because even after they have disappeared or the agent finds him or herself beyond their reach, the knowledge that was generated by the sensorimotor or mental action persists in time by

being embedded in memories as an abstract idea. The consciousness that is generated by the worldview, expressed through the cognitive space or artefact, endures within the mental organization of the interacting agent's knowledge.

Obviously, the worldview that regulates the new media art installations in relation to the inter-actor can show different levels of permeability depending on the theoretical load, the experience and the state of the inter-actor's attention. This is a state that enables an increment, with different level of inscriptions, of the cognitive experience of the enactive phenomenon. [11] However, in all these cases the incorporation of the phenomenon into the agent's consciousness tends to last over time.

CONCLUSION

In conclusion, we propose the need to differentiate between cognitive artefacts or spaces by focusing on two aspects: the modification of cognitive structures and the immediate functional usability of the object. This is related to two possible categorizations, which are termed strong and weak. The criterion of organization for the strong category would be the persistent incorporation of knowledge into cognitive structures, which results from a global worldview in the production of the cognitive artefact or space. This worldview derives from the particular view of the programming artist or research group responsible for developing the cognitive artefact or space.

The weak category is defined in relation to local and instrumental cognitive processes. In this case, functional social, cultural, economic and other local abilities can be acquired provided that the given cognitive artefact or space remains active. This implies a process that takes place in the context of immediate cognition and, therefore, neither modifies cognitive structures nor leads to their integration.

The categorization of cognitive artefacts or spaces as either weak or strong thus depends on the form of cognition with which they are associated, i.e. one that is locally contextualized and immediate (weak) or, in the case of the strong category, one derived from a global worldview which becomes integrated within the agent's cognitive structures and, therefore, is able to endure beyond its locally contextualized use.

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CYBERNETIC SERENDIPITY REVISITED: INTERACTION, PLAY & FUN FROM THE UNIVERSE OF ELECTRONIC ART TO METAVERSE

ALMILA AKDAĞ & BEN SCHOUTEN

Since its first introduction, the concept of cybernetics spread widely through many branches of academy and percolated into the everyday life soon after. Even now, it continues to affect our social and cultural life greatly. Here, we will trace the impact of cybernetics on electronic art, and how this impact resonates with 21st centuries' social online networks and metaverses in the idea of participation, co-creation, and constant flux.

Introduction

In 1968, the time was finally ripe for an exhibition where robots chased the audience and changed the lightning according to environmental sounds like clapping hands, where one had the chance to encounter computers writing poems, and machines drawing interesting geometric figures that played magical tricks with your visual system. Today, after 60 years, it has acquired the status of a myth among the cognoscenti of computer arts. In this paper, we will trace the links between the metaverse and electronic art to those first years, and to the impact of cybernetics.

From cybernetics to the fundamentals of electronic art

The term 'cybernetics' was first used by Norbert Wiener in the title of his famous book "Cybernetics or Control and Communication in the Animal and the Machine". Cybernetics grew partly out of Shannon's information theory, and its etymology goes back to the ancient Greek word *kybernetes*, meaning steersman or governor. The title of Wiener's book includes an appropriate definition of the concept, which is effectively a theory of control, i.e. of the principles that govern the behavior of adaptive systems (e.g. animals and machines) in dynamic environments.

Two concepts were particularly important to cybernetics. The first one is teleology, by which Wiener denoted the 'purpose' that guided the behavior of an adaptive system. This concept relates to planning and autonomy, issues that are still important aspects of robotics. The second important concept was self-replication, which is a natural property of living systems. In short, cybernetics sought the principles behind mechanisms of replication and reproduction that were equally applicable to artificial and conceptual systems. Katherine Hayles charts the transformations of the concept as it diffuses into the cultural space, by examining the equally influential information theory in broadest sense, and taking into consideration a bidirectional flow between the cultural/social circumstances of the times and the scientific agenda. [1] Here we would like to focus on the initial activities that transferred ideas from cybernetics into arts.

Abraham Moles and Max Bense were the first to apply information theory to arts at a theoretical level, when they tried to capture the essentials of aesthetics with the use of cybernetic thinking. [2] [3] However, on the level of applications, we should name the British artist Roy Ascott as the pioneer. Already in 1961, Ascott was teaching at Ealing School of Art a curriculum that fused cybernetic thinking with art education. In 1964, he displayed pieces based on these ideas in an exhibition entitled *Diagram Boxes and Analogue Structures*. Later on, he published the philosophical aspects of his work in the journal *Cyber-*

netica in a two-part article, "Behaviorist Art and the Cybernetic Vision." [4] In this paper, Ascott describes a cybernetically driven art theory called Cybernetic Art Matrix, CAM for short. CAM's prerequisite is an environment that calls for user participation in creating an art object. This environment is set up in a way to force the audience, or in Ascott's terminology, the participant, to give feedback, through which the participant engages in a decision making activity concerning the art object. The end result is the joint creation of the object by the artist and the participant. Ideally, this object would be an open project, in constant flow and never ceasing to take on new aspects. With every new participant, the creation process would re-start or expand, and this circulation would continue until some physical limit (e.g. end of the exhibition) brings the process to a halt.

Apter notes that Ascott's idea of 'art as a process' had a great appeal for artists, as it formulated art as a dynamic system that comes into existence only through the feedback loop between the artist and the audience. [5] As Ascott details in his papers, this line of thinking is in continuity with the modern art's "behaviorist" tendencies. In contrast to the traditional understanding of an art object with a well-defined body, ways of construction (such as painting and sculpture), and a specific space for dissemination (i.e. museums, galleries, fairs), cybernetic art opened the doors to a new way of making, experiencing, sharing and displaying art. Franke sums up the aesthetics of this new type of art object as: "The conditions of optimum aesthetic communication can be obtained from a determination of the reactivity of viewers of works of art. Art then is a part of a process of regulation (in a cybernetic sense) in which an artist seeks to achieve the maximum of receptivity." [6] The actual impact of cybernetics on arts clearly manifested itself in the form new meanings attached to arts and in the understanding of what makes an art object, as well as in the ways of how art production has changed. The concepts of feedback, interaction, information sharing and 'art as a process' led first to Telematic Art, then to Telepresence Art, both of which eventually falling under the heading of New Media Art, as Electronic Art is called today. [7]

From interaction to open-ended play

In their "Book for the Electronic Arts," Mulder and Post subdivide the modern art practice in stable and unstable art. [8] With stable art they denote the culture of "high art", driven by the materiality and of secularity of art objects. Unstable Art, in contrast, is more volatile, as it is participatory, performative and in constant flux, and is based on (shared) experience. Stable art is serious, unstable art is playful. In modern games and playful interaction the principles of unstable art are more alive than ever.

In the last decade digital games introduced new concepts in the context of playing: a virtual game space containing interaction space allows gamers to communicate, decide and create. These actions are all in line with the ideas expressed in the previous section, namely that the idea of being a part of the process inherently follows the principles of cybernetics, and opens up a performative space. In this sense, some artworks resemble games, and vice versa. A famous example of this is the computer artwork *Daisies*, by Theodore Watson. In this interactive installation, daisies are projected on a floor, creating an immersive game experience, in which the user is central. You walk over the daisies and the daisies die under your feet, only to quickly grow back a few seconds later.

In the 90's, based on these concepts, designers and artists created interactive environments, mainly supported by video images and interactive sound. In this context, Marinka Copier's definition of play becomes crucial. She describes games as a system of communication and continuous negotiation of (role) players with socio-cultural network of human and inhuman actors. [9] Copier formulates a comprehensive description of (role) play that does not focus on actors like rules, goals, objects, or environments, but instead investigates the relations between all actors. Role-players actively negotiate with the game mechanics, socio-cultural mechanics, as well as individual-personal ones. From these negotiations a play experience emerges. The play experience and the activities related to these experiences are in a constant state of flux. It is in this continuous change that the characteristic of play can be found, and is

often defined as open-ended play.

Instead of designing for goal-directed behavior, as is assumed by, for example, Norman's action cycle the definition of open-ended play assumes that players do not structure their activity beforehand, but that activity grows as the interaction in the context of use occurs. People are opportunistic as they interact with the world. These ideas are inspired by theories about situated action [10] [11] [12] and above all on emergent behavior in decentralized systems, [13] which relates to the aspect of cybernetics as regulatory systems. According to Resnick, nature provides us with various examples where local behavior leads to global patterns. For example, individual birds in a flock use only simple local rules related to nearby birds, which lead to organized flock patterns. Programs in his parallel programming environment StarLogo have shown that by giving objects or agents local rules overall patterns can occur in simulated environments (or micro-worlds). But most importantly, local rules are shaped by players' participations and actions, and the patterns of the overall game emerges through these interactions, or in other words, through the wisdom of the crowd.

Play & Fun in Metaverse & Social Networks

Games in social networks like Facebook become more and more popular as they can be played everywhere and anytime. They enable expression through role-play, interactive attributes, measures and other (nonverbal) communications. In modern identity construction, (instant) meaningfulness is of increased significance. [14] This (instant) meaningfulness can, for example, be established in playing the same games in social networks (MafiaWars (Zynga 2008), PetSociety (Playfish 2009), or RestaurantCity (Electronic Arts 2009)) other activities like chat, msn (Microsoft 1999), Skype (Heinla, Kasesalu, en Tallinn 2003) etc., or belonging to the same interest groups. In Social Games like Farmville (Zynga 2009), identities are reshaped through collaborations around certain thematic activities. Within these online games a friend's value corresponds to his or her instant meaningfulness in the game. To be a friend in FarmVille, means to be of value. A friend transforms in a sort of commodity since friends are assets to play the game. This directly ties-in with the social rules on social networks, in which someone's popularity, and 'value' is qualified by his/her number of friends.

Here for us the most important thing is that the boundaries between 'play time' and other activities cease to exist: accessing the social sphere of the virtual games can be done via handheld devices, mobile phones and computers while working, eating, and even playing other games. The second factor we would like to emphasize is the erasure of the roles/identities: a dear friend becomes a commodity during the play experience, but with a switch for example from the play window of FarmVille back to Facebook home window, the everyday 'identity/role' of the friend is restored.

In modern play-design games and playful interaction are situated in real life as part of everyday activity; a playful approach in which games can be called upon when necessary as part of existing applications in learning, social networks, etc. [15] This requires a social intelligence in game design and will lead to games that are embedded in systems of social meaning, fluid and negotiated between us and other people around us. In this way game design focuses on interactive products as creators, facilitators and mediators of experiences as well as the creation of opportunities.

Damer makes a distinction about the 'game-play virtual worlds' and 'social virtual worlds', emphasizing that the latter differs from the former primarily because it is based on the freedom given to the players for building both the virtual world, as well as the social atmosphere and the game space in it. [16] In contrast the game-play worlds come with predefined rules, and scenarios. We can state that social virtual worlds resemble the idea of open-ended play.

An interesting thing to note here is about the artistic dimension of these worlds, and the question of creativity & artistic expressions experienced by its users. The general impression is that most of the artistic practices in these spaces are still confined to the existing forms of art creation and dissemination (Lester et. al. 2009). It is expected that with time, when virtual reality loses its novelty of offering a new

experience, the potential it generates will be explored thoroughly, and new forms of arts will be born out of these explorations. There are already many fruitful virtual exhibitions hinting for this next step. However, we believe that these virtual worlds and social networks will have a much bigger impact on the understanding of art. A simple google search for the most popular virtual worlds like World of War Craft and Second Life shows that their popularity extends to the social network sites as well. Here, for us, the most interesting social sites are the ones devoted to art (deviantArt, Flickr), and media (Youtube, MySpace). For instance, in deviantArt, there are ample groups around these cult-spaces, and many users not only uploads screenshot of their experiences, or their avatars, but also share tutorials and textures to help other members in educating how to create in virtual worlds. In other words, some players, first experiment themselves how to create 'art', and then share their knowledge with other members for them to join the experience.

Conclusion

The ubiquity of virtual social platforms, and the effects of overabundance of media lead some critics to question the role of the artists in current society. For some, spaces like metaverse offers, and forces the artist to go beyond the traditional artistic goals like catching/questioning the reality, and to become a scientist/technician redefining/creating the reality. For others, art as such does not even have a role to play anymore. In this paper, we tried to contradict these extreme postulations about art in metaverse by pointing out the potential of social spheres of networks and metaverse have on the dissemination and (hence) the definition of art.

Mulder and Post trace the transition of electronic art from machine to media, from there to interface, and lastly to networks. [8] We would like to conclude our paper by asking the question: What is next? We hope that the next step in the evaluation of electronic art will be the realization that expertise has lost its importance. Only then, art will be detached from its high pedestal and materiality by becoming the toy of the layman. Everyone who uploads a picture, designs an avatar, creates a space in Second Life, comments at someone else's pictures in Flickr or deviantArt will be entitled an 'artist' if they care to take on this title.

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MUTATE OR DIE: A WILLIAM S. BURROUGHS BIO-TECHNOLOGICAL BESTIARY

TONY ALLARD

This afternoon I will discuss my current collaborative bioart project, "Mutate or Die," and along the way I will touch on some key aesthetic, ethical, and philosophical issues that are inherent in the creation of bioart works. My collaborative partner, Adam Zaretsky, and I have gained support for our project from Grand Arts, an experimental presentation space and artistic production facility in Kansas City, Missouri.

Mutate or Die: a William S. Burroughs Bio-technological Bestiary

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This afternoon I will discuss my current collaborative bioart project, *Mutate or Die*, [1] and along the way I will touch on some key aesthetic, ethical, and philosophical issues that are inherent in the creation of bioart works. My collaborative partner, Adam Zaretsky, and I have gained support for the project from Grand Arts, an experimental presentation space and artistic production facility in Kansas City, Missouri. We launched the project in July of 2010, and its development will span three years, culminating in an installation and performances at Grand Arts in September of 2013.

Introduction

"Rational thought is a failed experiment and should be phased out."
-- William S. Burroughs

In 1996, attempted to get the writer William S. Burroughs' DNA sequenced at the University of Missouri in Kansas City. For various and interesting reasons, Burroughs' DNA never made it into the sequencer, and I put my attempt back in my subconscious for a very long time. Now, some fourteen years later, in retrospect, I have started to realize that in my attempt to get Burroughs' DNA sequenced in 1996, I was unwittingly tapping into a Burroughs' multi-temporal, nonlinear reality. That reality is summed up in this quote from the Brion Gysin/W.S. Burroughs third mind, "When you cut into the present, the future leaks out." [2] Fourteen years later, the future is leaking out in the form of my current collaboration with bioartist Adam Zaretsky.

At the core of our project will be a gene gun blast performance, which will involve shooting a random segment of raw DNA extracted from the 'beat scat' of William S. Burroughs into another organism's genetic code. This biolistic cutup will produce the potential for a transgenic mutation to occur in the future. After the gene gun blast, we are anticipating that the resulting mutations will give us a code, a sign, a transgenic hieroglyph left upon us. In this wet, oatmeal like substance, there may be a new text that will tell us how to make a highly bent immortality blueprint, there may be an edifying nightmare of 'homo sap's' [3] future, there may be a tasty recipe for Gonad Jam, or there may be proof that indeed, language is a 'virus from outer space.'

Over a span of three years, Adam and I will be going into the lab and getting scientifically funky with mutagenic protocols, and exploring the role that mutation will no doubt play in the future survival of the human genome and species diversity on this planet. We will also be challenging some of the mystified bio-technological protocols of directed evolution and privatized knowledge bases being generated by the life sciences, and the biotech industry in particular. Specifically, we are challenging the biotech industry's corporate approach to genetic research and development, and its enormous investment in the illusion of objective, rational control over the organic and inorganic world. We are challenging the biotech industry's patenting of life forms, which basically amounts to stealing the human genome and others from what the writer Lewis Hyde has identified as 'the commons.' [4] Historically and contemporarily, the commons have been and are the collectively owned natural and cultural resources that we all can legitimately lay claim to using. We are, in fact, modeling our project after the commons, Do It Yourself (DIY), and open source movements.

We are taking the commons, DIY, and open source approach to making bioart and doing science for the purpose of demystify biotechnology, and getting the public proactively involved in a debate about the role that random mutation plays in generating diversity within a species. *Mutate or Die* also confronts the almost total media blackout of any critical discussion about what could be described as the biotech industry's thinly veiled programs of eugenics. This new and highly profitable cottage industry that has sprung up in the exact sciences is clearly in the business of eliminating biologic impurities and mutations in its short-sighted effort to sell genomic purity to an uninformed, and bio-technologically illiterate public. The industry's genomic cleansing products are sold under the various brand names of human betterment, enhancement, miracle cures, and progress.

For obvious financial reasons, and I will venture to say political reasons, the biotech industry is quietly keeping biotechnology cloistered in high tech research facilities and out of the hands out of the general public. Adam and I, on the other hand, will be creating a DIY lab that is accessible, interactive, and open to the public within the installation at Grand Arts. We will stand shoulder to shoulder with the public, working in a not-for-profit lab of our own design, and creatively use biotechnology and poetic protocols together. The transgenic protocols we are developing for the lab are intended to set in motion processes of uncontrolled, random mutations which will have the potential to re-introduce novel mutagenic influences into the still relatively free genomic playing field on this planet. Unlike the biotech industry and a lot of trans humanists who are primarily focused on eliminating entropic, mutagenic processes, we are interested in introducing more mutagenic processes, which are at the core of species diversity and survival.

Mutate or Die, a bioart project in progress

"When you cut into the present, the future leaks out."
 -- Brion Gysin/W.S. Burroughs, *The Third Mind*

In 1996, when I attempted to get William S. Burroughs' DNA sequenced, I was also experimenting with some of the literary and cinematic cutup techniques that Burroughs and the painter and poet, Brion Gysin developed in the 1960s. Burroughs would go on to use the cutup technique to engage randomness and chance in the writing of his aggressively nonlinear trilogy of novels, which include: *The Soft Machine* (1961), *The Ticket that Exploded* (1962), and *Nova Express* (1964). With this trilogy, Burroughs shattered the centuries-old linear narrative form, and put in its place a text-based form of traveling back

and forth in time, which is similar to flashing forward and backward in time in cinema. The cutup technique also provided Burroughs, and by extension the reader, with a means to get at the content of a text that is not accessible through linear and rational thought processes. With our current bioart project, Adam and I are re-engaging Burroughs' cutup technique and nonlinear processes at the genetic level in living organisms. Through the medium of a gene gun, we will set in motion a genetic cutup by randomly combining Burroughs' genetic code with those of other organisms. These biolistic cutup techniques and the results we are anticipating have affinities with the literary conceits of mutagenic forces and mutants that run throughout many of Burroughs' novels.

With this project, Adam and I are literally taking up the challenge from Burroughs to 'mutate or die'. Burroughs thought that if 'homo saps' are to survive in the toxic political and biological environments of the earth while we are preparing ourselves to leave the planet, then we need to unsentimentally mutate into biological forms that are adapted to these harsh environments. Burroughs puts this mutational survival strategy in perspective when he stated "It would involve a biologic mutation quite as drastic as was involved in the shift from water to land." [5]

This radical biologic mutation will be a truly tall order for humans to fill because we are becoming quite comfortable with and bio-technologically capable of taking the human genome out of the mutagenic, diversity-generating mechanism of our species hereditary and evolutionary trajectory. The biotech industry is only too eager to kick its bioinformatics machines into high gear and stop the mutagenic forces of evolution, and put the human genome in a kind of eugenic holding pattern indefinitely while their short term goals and market shares 'vampirically' increase.

We humans, who are now bio-technologically and rationally poised to reconfigure our genetic code and what it means to be human, would do well to give Burroughs' literary conceits of mutation and mutants due consideration and room to roam in the real world. We humans, who are now beyond the flirtatious stage of putting the prefix, trans(genic), in front of human, would do well to study Burroughs' dismantling of the exact sciences' taxonomy of the natural world in order to make room for mutants that stand outside the natural order, or as he tagged them, 'natural outlaws.' [6]

The Art of Risk: Bioethics Tour, San Francisco, October 2010, San Diego, July 2011

Before we began the actual wet work of extracting the DNA from the preserved sample of 'beat scat' in June of this year, we went to San Francisco in October of 2010 on the first leg of what we dubbed our bioethics tour. After the wet work had been undertaken in Kansas City, we returned to the West Coast and did the second leg of the tour in the biotech capital of the world, San Diego.

After we came back from the San Francisco leg of the tour, R.U. Sirius, the then editor of the online trans-humanist magazine, H+ (and one of our interview subjects), published our questions and the primer on the project in H+, in February of 2011 (<http://hplusmagazine.com/2011/02/06/mutate-or-die-a-w-s-burroughs-biotechnological-bestiary/>). As a result of the H+ publication, our efforts to bring the discussion to the public went viral within days after the article went online. The H+ publication began almost immediately to be linked and aggregated on such sites as Dangerousminds, Boing Boing, Flavorwire, and Lifeslittlemysteries. Much like Burroughs' conception of how language works as a virus, the hyperlinks, comments, memes, and bad puns that appeared on sites early on in the week began to replicate and mutate, and in some cases were transformed into misinformation about the project. Nevertheless, there are some telling comments about the power of peoples' imagination and mutaphobic fears that emerged after they put aside traditional taxonomies and began to entertain the idea of a transgenic

mutant living among us. In fact, one mutaphobic fear that got a lot of airtime was the possibility of a mutant Burroughs clone being set loose from our lab and reeking biological and psychological havoc on planet earth. It is exactly these kinds of responses posted by the public online that we will be including in the installation and on the project website (<http://mutateordie.net>). Allowing the public to weigh in on the ethical and philosophical aspects of the project is a significant part of our efforts to open up a dialogic space that is critical to the survival of our contemporary biological and cultural commons.

Bioethics Tour Questions

What follows are questions we asked interview subjects on the San Francisco and San Diego legs of our Bioethics tour. To date we have interviewed, among others, Hank Greeley, a Stanford law professor, and consultant to the U.S. government on bioethical issues, filmmakers Lynn Hershman and Craig Baldwin, Ricardo Domínguez, a University of California, San Diego Professor and co-founder of The Electronic Disturbance Theater (EDT). We also interviewed a senior researcher on the Human Microbiome Project (HMP) at the J. Craig Venter Institute in San Diego.

Question 1: Queer Anatomy: Beyond Enlargement

There seems to be a lot of publicity around transgenic transhumanism these days. Promoting human use of biotechnology to redesign ourselves is not the worst idea. Unfortunately, most human genetic modification advocates forget to think creatively about the full range of forms and beings into which we could force evolve ourselves. They tend towards a naïve optimism based on futurist potentials, emphasizing: longer lifespan, more beauty and bigger brains. Where can fringe anatomical and metabolic goals take us, beyond enhancement, general enlargement and ‘goody two shoes’ betterment? While redesigning ourselves what other directions might we investigate? What resulting forms of genome bending would exemplify the politics and aesthetics of W. S. Burroughs fiction and theory? (See related concepts from his writings: i.e. cut-up, junkie life, control and language as a virus, Dr Benway.) What queer advice can we give to artists and engineers who would intentionally alter future peoples’ minds, senses, body differences and living décor?

Question 2: Mutation

This project involves random segments of DNA being incorporated into the genomes of sperm, blood cells and microflora. Most random mutation causes instability and harm to organisms. Only very occasionally does a mutant worm grow elbows as humans did. Fitness may just be a lucky oddity; most of the poetry of random DNA upsets the stability of life’s repetitive anatomy. We believe that directed evolution is just as fallible in the long run, we want to ask you what the difference is between letting the production of life differences be spontaneous collage versus an aesthetic based on maximizing short term market shares, ‘enhancing’ traits based on human goals and using organisms as production factories for pharmaceuticals, industrial products and food? When it comes to transgenic art, is it preferable to gamble in the dark with another’s heredity or try to tailor someone and their kindred?

The title of our project, *Mutate or Die*, comes from William Burroughs’ frank admonition of homo saps to mutate or die. In essence, this project will literally take up Burroughs’ challenge to mutate or die, and will function in a similar fashion that basic research does in that it will, through direct manipulation of genetic material, proactively speculate on the role that mutation can play in the survival and future of

the human genome. What are your thoughts on the actual, wet work of mutation-based bioart, versus strictly representational, mimetic art? What science fiction premonitions do you think can be applied through creative biotechnology to alter the future of, not just humans, but also all organic beings?

Question 3: Sex

Inserting genes into a hereditary cascade is a great responsibility but it is also a powerful sex act. In biology, sex is defined as the passing of genetic information into the lineage of progeny; meaning and transgenic protocol is sex. This question is about the desires and satisfactions of the experimenter during the techno sexual process of getting the genes into the being to be fucked. Many tinker with the gonads of yeast, worms, rats and in the case of humans, gene therapy. There is a question as to what kind of erotic, pornographic and even deadly economies drive this work? What is the flavor of the compulsive urge to control reproduction? What is the quality of the scientist's satisfaction when shooting a signature or a graffiti tag into an unsuspecting life's form? How is the humping joy of defect sex ameliorated or amped up through technology?

This is not an easy question as the economies of techno-sex and sadism as an energy are not simply negative in the world. We cannot pretend that technology is without certain connectivity, or that life is not driven by libido. What kind of sex is interspecies gene gunning? How is the perverted act of shooting nuclei with genetic choices made to seem formally neutered of hotness? Can one imagine the moment of pulling the trigger of a loaded gene gun as a pornographic, erotic and dangerous yet orgasmic pulse as a sex-positive relation? What types of connections can be made between our biolistic aesthetic of shooting genetic information into a target that will result in a cellular based mutation, and Burroughs' ballistic aesthetic of shooting a target tacked to a piece of plywood in order to generate a psycho-symbolic mutation? What can be said about the frank fact of the destruction that results from shooting any type of gun, regardless of what/who the gun is aimed at?

Question 4: Scatological Biopolitics

The Human Microbiome Project (HMP) is based on studying the life that lives within us. This is our second genome, our internal ancestors and possibly the source of our third mind. What kind of beings might result after insertion of scrambled shit gene in their family tree? What kinds of identity splay can we expect from becoming bacterial? What is the social and political definition of excrementality, when scientists play with shit, is it kinkier or are the kinks ironed out somehow? In which ways will this project change the cultural reception of scatological action? By way of literally getting into W.S. Burroughs' shit, can we transcend its waste status and legitimately ascribe use value to it? Can we actually time travel back to Bill's gut/intestines at that time (1995 when the sample was acquired by Burroughs' plumber) and biolistically liberate any information that may add to mutant-divergence for the future survival of trans homo saps.

Question 5: Art of Risk

What is your personal risk/benefit assessment on the artistic use of a gene gun to make living animal/human/non-human/cultures of mutagenic difference? Feel free to comment as a bioethicist, ecologist and art critic. There are some laws of course, but we are asking your opinion. Is art allowed to play with as much risk as science? In the name of art or science, where do you draw the line? What should

not be allowed to be done to the ecosphere, to dignified living beings and/or informed, human volunteers?

Interviewee Responses to our questions (Video online)

<http://mutateordie.net/content/bioethics-tour-short-version>

'Natural Outlaws' creating a William S. Burroughs Biotechnological Bestiary

Bioart often uses cutting edge and DIY biotechnology as an art-making medium, and it specializes in presenting living organisms as art. This past June, we worked in a multi-million dollar research lab at the Kansas University Medical Center, and extracted DNA from a preserved sample of Burroughs' shit, and put it in a deep freeze for future use. Our next step this winter will be to get trained in a genetics research lab on how to use a gene gun. However, in the spirit of the DIY movement, we are looking into the possibility of making our own gene guns and nano gold dust for the gene gun blast performances in the installation.

The following is a very condensed version of one of the poetic protocols we are developing for the DIY lab we will be creating at Grand Arts in Kansas City in September of 2013.

Take a glob of William S. Burroughs' preserved shit
 Isolate the DNA with a kit (\$300 from Quiagen Technical)
 Make, many, many copies of the DNA
 Soak the DNA in nano gold dust
 Load the DNA and gold dust into a gene gun (a modified air pistol)
 Fire the DNA and gold dust into a mix of fresh sperm, blood and shit
 Call the genetically modified mix of blood, shit, and sperm a living bioart, a new media paint, a living cut-up literary device and/or a mutant sculpture.

Putting on the Gloves, Opening 'the commons'

We are modeling the installation and performances after the commons, DIY, and open source movements, and are planning two primary types of interactivity: the DIY lab in the installation at Grand Arts and its virtual counterpart online at <http://mutateordie.net>. In our DIY lab, the public will be able to get their hands on some biotechnology and make bioart with Adam and I. The public will also be able to write and draw in the installation and online, giving their thoughts and imaginings as to what kind of mutations and mutants might emerge in the future from our biolistic cutups. Most importantly, the public will be able to leave their mark and weigh in on the ethical and philosophical implications of adding novel forms of mutation and transgenic mutants into the mix on planet earth.

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CREATIVE ECOLOGIES IN ACTION: TECHNOLOGY & THE WORKSHOP-AS-ARTWORK

Jamie Allen, Rachel Clarke, Areti Galani & Kamila Wajda

A shift is occurring, particularly evident in art-and-technology contexts, in which the artist-led workshop is transformed into an important and distinguishable artistic form. Resulting from, and contributing to, the new accesses and relationships people have to information, creative culture, materials and one another, the “workshop-as-artwork” is proposed, outlined and exemplified.



Fig 1. Participants doing a public performance at the Chiptune Marching Band event at the NK House, Berlin, in August 2009. Attribution Jamie Allen



Fig 2. A Sundroids participant at Harehope Quarry UK, presenting his solar powered kinetic work to the participant group in June, 2010. Attribution Rachel Clarke.

ON TECHNO-SOCIAL ART FORMS

Technology situates and constructs what it is to be a creative human being. Our technologies are never "just tools," nor are their effects and resonances limited to the individual practices of artists-as-producers-of-work. Contemporary cultural activity with technologies is not "production," in the classical sense. Understood as both an ecology and entanglement of people, ideas, tools, materials, systems and processes, art-and-technology grows to encompass a complex and expanding set of forms. For example, recent suggestions are of the "artwork as social interstice" would be impossible except through resonances with an ultimately techno-social tool: The Internet. [1] True to its history, art-and-technology and related practices continue to be sites of endeavours that seek to question and escalate the assumptions of art, artist, audience and form. [2]

Resulting from, and contributing to, the new access and relationships people have to information, creative culture, materials and one another, we propose the "workshop-as-artwork": The technology-based artist-led-workshop as the site of an emerging artistic form. This idea seems particularly evident in art-and-technology contexts, where an assumed importance of the transfer of practical information and technical skill often merges with interests and expertise in performance, installation, theatre and on-and off-line communications and media. Positing the workshop-as-artwork as a creative ecology in action provides a way of locating these works along with other strands of ecological thinking and acknowledges that artistic *form* as we have come to know is in many ways unlocalisable.

Such a proposition also calls forth instructive criticisms. The increased frequency with which artists are called upon to deliver workshops can cloud artistic or personal objectives, especially when done in the service of intermittently insincere institutional and political "community engagement" agendas. The workshop-as-artwork may also seem ancillary to more production-oriented, neo-romantic, individualistic notions of how an artist should be spending his or her time. That said, "doing a workshop" now forms such a large part of the average art-and-technology practitioner's activities that discussing its repositioning as a form, developed in its domain of practice, seems productive. We also seek a vehicle for developing better conditions of the co-created meaning that can take place at such encounters. Further, from the artist-interventionist point of view, positing the workshop-as-artwork serves to update notions of legacy, consequence and significance for the art-and-technology practitioner within his or her community.

Drawing on a set of select technology-based art-practice workshops with various communities, we posit the workshop-as-artwork as this collaborative, ecological artistic form and describe some of its attributes and potentials.

SIGNPOSTS TOWARDS A CREATIVE ECOLOGY

The ideas herein are indebted to topics through artistic, techno-social, and pedagogical theory. Our creative practices and thinking have been influenced by the works and writings of Allan Kaprow and his formulation of the "Happening," a social artwork which is at moments performative, relational, environmental and situational. He and others sought to create a form that would encapsulate and elaborate public performance towards an integration of "art" and "life," and further towards the complete dissolution of "art" as a separate category. [3] It is of note that a number of art-and-technology practices (net-art and other interventionist new media work) echo sentiments purporting fuse high and low brow, the aesthetic and the political, gallery and "street" culture - bringing life into art and vice versa. [4]

Joseph Beuys' ideas of Social Sculpture, the possibility of a social organism as a work of art, also outlines aspects of our project. A desired integration of purpose carried over into Beuys' great valuing of pedagogy. Much of Beuys' persona and activity during his career was developed through dialogic lectures, workshops and conversations. As Beuys himself said: "To be a teacher is my greatest work of art." [5] Beuys wanted to blur the line between civic action and artistic techniques, completely and radically transforming the "idea of sculpture... or of art in general." [6] Considering this ontology of the art-object and form, Umberto Eco's Open Work, in which art "determines the limits within which a work can accentuate its ambiguity... while keeping its existence as a work," is a helpful construction. [7] Parallels in materialist thinking have adopted terms like "assemblages," and more recently "hyperobjects," [8] to name a similarly and difficultly described "kind of relation obtaining between the parts of a volatile but somehow functioning whole." [9] Eco lays out a shift which occurred in the 20th Century from origination with concrete, authorial propositions, towards "universes" or "fields" of "possibilities," [10] that could serve to define what is intended by *creative ecology*, as a "properly ecological form of... art." [11]

The idea and importance of "conviviality" as a criteria for technologies and their use, as first outlined by Illich underpins this discussion. Illich explains conviviality as a force opposing industrialisation, as he believed the latter to have grossly distorted our sense of possibility for change in modern society. He imagined, "a society of simple tools that allow men to achieve purposes with energy fully under their own control." This would be achieved via the development of open and participatory technologies and tools, and a "deschooling" of society - an integration of pedagogy and everyday experience. [12] The workshop-as-artwork is sympathetic to these strains of thought. Constructionist approaches to epistemology and pedagogy which emphasise both learning by making and a close engagement with tangible objects form part of our practical approach to these ideas. Any learning that purports creative empowerment should not be concerned so much with the transmission of ideas, but oriented toward the construction and reconstruction of knowledge through experience. [13]

THE WORKSHOP-AS-ARTWORK

Over the past four years, the authors have designed, executed and documented a series of workshop-as-artwork events in art-and-technology festivals, conferences and as part of school-organised activities for young people. These have all emphasized concepts related to renewable energy technologies, as a means of encouraging improvised, public electronic-art making. A sensitivity to the use of electronics as enablers for creative expression in social and public spaces was key to all the events. What follows is a description of a selection of workshops, (Transmisol, Chiptune Marching Band and Sundroids) that express the theoretical goals of the workshop-as-artwork in various ways and to varying degrees.

TRANSMISOL

Transmisol is a 3-day workshop-as-artwork that first took place in Mexico City in the summer of 2008. The event was developed as a collaboration between artist Geraldine Juarez and Jamie Allen, and is inspired by the work of Transmission Artists, such as Tetsuo Kogawa (author of the "Micro Radio Manifesto"). [14] Participants at the event were a group of young people aged 18-20 who were attending the Transitio Festival, a week-long new media and electronic arts festival. The Transmisol group was invited to make a set of solar-powered MP3-player and radio transmitter devices, to be installed in public space as a distributed Transmission Art exhibition. Each attendee was encouraged to scavenge the streets of Mexico City during the evenings to find elements for physical housings to hide and contain the solar

panel and radio transmitter units they hacked and assembled; found items included an orange child's play-stove, and other household items.

Participants' responses to the question of "content" for their micro-radio experiments in many cases involved a selection of revolutionary and anarchist texts read into the provided portable MP3 recorder/players. Discussion with participants clarified their motivations to be, in part, a particular response to corrupt administrative and media-industry practices and related problems with wealth distribution in Mexico. Participants understood that they were creating a solar messaging system which (under the Mexican sun) could potentially broadcast in public, in perpetuity (or at least as long as the electronics and hardware remained functional). Transmission Art, through the workshop-as-artwork, became a subtly political gesture - a modest opening up of an otherwise hierarchical media network.

CHIPTUNE MARCHING BAND (CTMB)

CTMB is a series of workshop-performances, inviting attendees to learn, build and perform together while engaging with local energy generation and public outdoor sound performance. CTMB workshops have been hosted by Maker Faire UK, Pixelache Helsinki, Bent Festival NY, NK House Berlin and Creativity & Cognition (all in 2009), among others, all with 7-20 participants at a time. CTMB is designed as a 3-hour event, during which participants build a small sensor-driven sound making circuit (oscillator), powered by an alternative energy source (hand-crank generator). Contrasting comparable workshops, [15] and the Transmisol workshop, a kit of parts including the majority of what is required to participate is provided at each event. Cardboard tubes, colourful tapes, paint, etc., are also provided for the construction and personalisation of the instruments. With instruments in hand, the "band," parades in the streets of the host city as a public performance and spectacle. At the end of the march, participants take their instrument home, along with a self-addressed stamped postcard and web URL, to be used to report back to the Band as to what has become of their instrument in the weeks following the event itself (Fig 1.).

A second workshop-as-artwork, CTMB materials consisted of simple electronic components and cardboard tubing. This material framework was provided along with extensive online community information, a guidebook, a developed graphic identity and uniform design, as well as a gallery website featuring profile photos of everyone who's ever participated in a CTMB (chiptunemarchingband.com). These informational structures were intended to create a highly coherent aesthetic entity, a resonant structure of invitation, web-presence, event and performance. At the end of the CTMB events, everyone involved becomes part of the Band, both through membership and through performance. This is supported by a belief that an intrinsic intertwining of artwork and social structure happens best where people are "consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe." [16]

SUNDRIDS

Sundroids is a one-day workshop-as-artwork using solar robotics to create autonomous kinetic sculptural works for and within the rural environment. These have taken place at Harehope Quarry, a sustainability co-operative and outdoor creative educational facility in rural Northeast England, and invited secondary schools take part in day long sessions. The sessions explore site-specific and kinetic art through the use of found materials on-site and simple solar powered motor circuits.

Art-practice inspiration came through the work of artists like Jean Tinguely and Arthur Ganson. At each event, participants work together collecting and discussing natural resources while exploring motion concepts and movement, through physical activities and re-animating found objects and materials. Participants are encouraged to scavenge found and natural materials from the site to develop their solar/kinetic work. Once students finish their structures, they present their work to the rest of the group (Fig 2.).

The third workshop-as-artwork developed, Sundroids emphasises an improvisatory and contingent approach to materials, movement and the openness of the encounter itself. The framework for each individuals' process is much less prescribed (in terms of materials) than with CTMB, allowing for more variation amongst individuals, while still presenting a cogent enough concept for the group to feel they were working within and towards an agglomerate artistic form.

CREATIVE ECOLOGIES IN ACTION

Nardi and O'Day use an ecological metaphor to highlight aspects of informational relations, hoping to imbue them with a sense of urgency, evolution, diversity and scale. A set of useful characterisations of ecological structures emerge for the workshop-as-artwork: [17]

- *Keystone species*: Explicitly, the "skilled people whose presence is necessary to support the effective use of technology," "the natural teacher" and "mediators." (p.53) Within the workshop-as-artwork artist-practitioners and educational practitioners assisted participant, primarily helping the technology work effectively. As we have noted, this was not just facilitated through skill *transfer* but also through embodied action and playfulness with materials to encourage exploration in a relaxed and friendly way.
- *Locality*: More than just in the geographical sense, the workshop-as-artwork arises through local context. For an information ecology, *locality* is a description of the "habitation of technology." The workshop-as-artwork is an exploration of a contingent habitation of this kind, and attempts to help people make sense of creativity with technologies on their own terms.
- *System*: Creative ecologies of art-and-technology, much like their biological and informational counterparts, are marked by "strong interrelationships and dependencies among its different parts." (p. 51) Genealogies of art-and-technology practice that cite systems theories (e.g.: cybernetics) as influential are worth noting here. [2]
- *Diversity*: Creative ecologies exist for and through a diverse set of individuals and communities engaged with them. In biological ecologies, diversity manifests itself through a variety of "niches", where the strength of an individual is supported locally by the environment around it, and the diversity of the environment in turn supports this capacity in the individual. In the design and action of the workshop-as-artwork, it is hoped that diverse styles, perspectives and interests are allowed to flourish, as a dynamic and agile support structure is present.
- *Coevolution*: Along with the interplay of individual actors and their local environment - there are the dynamics of their diverse temporal development strategies, rates and scales. "The social and technical aspects of an environment co-evolve." (p. 52) In the workshop-as-artwork opportunities for coevolution exist where and when participants are able to progress and participate, dealing with new technical and social conditions at their own pace, in an environment where performance is downplayed in favour of a valuing of process.

QUESTIONS & CONCLUSION

How might the art-and-technology workshop, conceived as an ecology of technologies, learning potentials, and creative possibilities be even further restructured as a more radical improvisation, Happening, or performance? Claire Bishop develops the idea of a collaborative/relational work which is not judged solely on its moral ("bringing people together") or instrumental ("teaching people to solder") merit. Instead she suggests that "practices need to be thought of in terms other than their ameliorative consequences; they should also question the very terms of these ameliorative assumptions." [18] As objects becomes assemblages, practices ecologies, and information ubiquitous, words like "laboratory" and "workshop" comfortably replace words like "gallery" and "exhibit." [19] In such a landscape, the workshop-as-artwork posits a framework for just the kind of questioning that Bishop suggests.

ACKNOWLEDGMENTS

This work would not have been possible without the support of Culture Lab, SiDE, Harehope Quarry, K. Ladha, J. Davoll, M. Barrett, T. Schofield, W. Scrimshaw, J. Shearer and K. Chen.

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F(X) - AN AUDIOVISUAL PERFORMANCE ENVIRONMENT

Alo Allik

$f(x)$ is an audiovisual performance environment to enable exploration of 3-dimensional continuous cellular automata. The automata provide the basis for sound synthesis and computer graphics parameter mapping. During the performance the behavior of the automata world is affected in real time in an attempt to reveal the complex and organic behavioral patterns in three dimensions and modifying the mapping space in response to them.

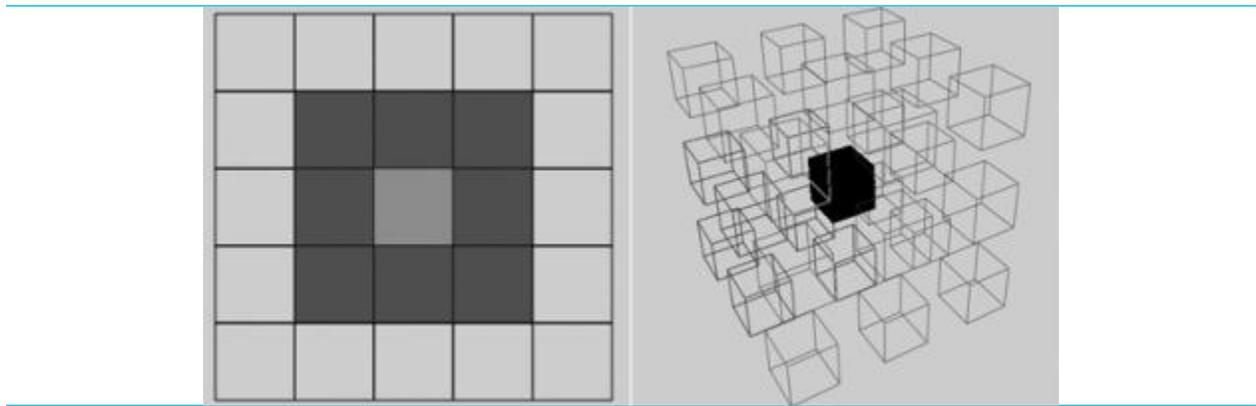


Fig 1. Moore neighborhood in 2D, with the neighborhood surrounding the center cell shaded darker, and the equivalent in 3D with the center cell represented as a black cube and the neighboring 26 cells as wireframe cubes.

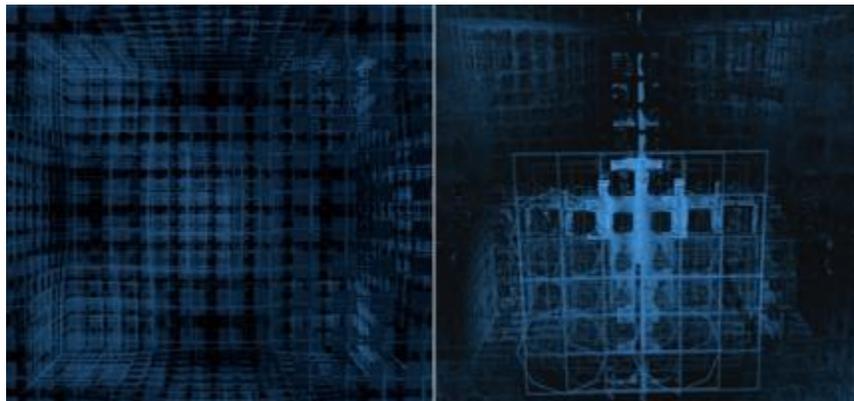


Fig 2. Snapshots from 'zone 01' of $f(x)$

Introduction.

Digital technology has provided an incredible variety of opportunities for artistic exploration and has fostered a new perspective on human culture and society. It has forced scientific methods and concepts into the working process and aesthetic framework of an artist due to its very nature. The beginnings of the digital computer are inseparably connected to research into the biology of self-replication and the possibility of artificial life. The early work of most remarkably Alan Turing and John von Neumann was essential to the way the modern world operates and the fundamental concepts based on the spectacle of biological evolution and natural selection have been integrated into every piece of digital technology with which we have surrounded ourselves. *f(x)* is a performance environment created to reveal some of the aspects and principles of digital technology. It is based on a concept that has only been made possible with the advent of computers - cellular automata – and was born out of research into artificial self-reproduction. It is designed as a live audiovisual experiment in which the performer interacts with a world of 3-dimensional spatial functions defined – analogously with the principles of cellular automata – in terms of each other. The performance is seeking to reveal complex patterns of behavior, generated by relatively simple instructions and rules that would uncover some of the elusive characteristics of digital media surrounding us now in almost every situation.

Cellular automata constitute an area of research belonging to the interdisciplinary field of complex systems science. They have been used as computer models mainly in computability theory, mathematics, theoretical biology and physics, but also have found many applications in generative art and computer music. The beginnings of the research in complexity can be considered as coinciding with the advent of the field of biology in the beginning of 19th century. In the middle of the twentieth century two independent lines of research were started that have greatly shaped our understanding of complexity. In molecular biology, it became evident from the research that led to the discovery of the chemical structure of DNA, that every living system is highly organized and this organization is coupled to a complex molecular apparatus, which functions as a stored information code for regeneration. There are two complementary modes of existence embedded in each complex living system: the internal physical-chemical workings of a cell and the informational mode where information is selected, stored, and interpreted by the physical actions. In early computer science research an investigation was launched into the nature of complexity in general in a computational or mathematical sense. John von Neumann initiated the study of self-replicating automata in 1940ies. He recognized the dual functioning of information that self-replication requires. The two modes are present in any cellular automata system as well: the dynamics of an automata system and the rules that evolve it.

Cellular automata.

Cellular automata are deterministic dynamical systems, which are discrete in space and time, operate on a uniform lattice and are characterized by simple local interactions. An automata world consists of a number of cells on a grid and evolves a number of discrete time steps according to a set of rules based on the states of neighboring cells. The behavior of every cellular automata system depends on four basic features: (1) the size along each dimension of the grid, (2) the number of distinct states, (3) neighborhood over which cells affect each other, and (4) the initial state of each cell at the outset. The most elementary family of cellular automata rules is defined as a one-dimensional row of cells in which each cell can only be either 0 or 1. The automata world evolves by iterating through each of the individual cells at each time step to determine the next state according to the established rule. The resultant patterns of

behavior can be characterized as 'emergent', meaning the local simple interactions can produce unpredictable and complex behavior on the global scale of the automata world. The main attraction of such a system is the demonstration of the dynamics of how complex structures can emerge from simple interactions without premeditated design or intention in analogy to the most basic processes in nature.

Automata in $f(x)$.

The automata principles utilized in the $f(x)$ environment are slightly modified from the standard discrete valued approach. It is also possible to contemplate systems where the values are not discrete, but continuous within a specified range. In such systems, the value of each cell can be defined by calculating the average state of the defined neighborhood. In this scenario, it becomes necessary to either multiply the average of the neighborhood of each cell by a fraction greater than 1 – e.g. $3/2$ - or add a value typically between 0 and 1 and then only use the fractional part of the result for the system to exhibit complex behavior similar to the elementary automata discussed previously. Otherwise the averaging process will quickly settle the lattice into a uniform state all across. The multiplier or the added value becomes the determining factor in the behavior of the automata on the global level, with smaller values producing an overall smoother transition effect.

The behavior of the continuous-valued world can be further affected by assigning weights to each of the cell's neighbors, making variable the amount of influence each cell has in the neighborhood. In this case, weighted mean value is calculated for each cell when updating the states. Weighted automata rules increase in significance as the automata world is extended into higher dimensions as the geometrical properties of the system become more pronounced. In the $f(x)$ environment, the automata idea is expanded into a three-dimensional world of regions, in which there are significantly more complex geometrical phenomena that emerge in the shape of patterns created. One can imagine a cube-shaped world of three-dimensional space sectioned into smaller cube-shaped regions, each of which has an associated state value and is defined in terms of surrounding space. The shape of the surrounding space depends on the neighborhood definition and is further molded by the weights assigned to each neighboring region. These spatial fluctuations can be viewed as continuous functions permeating a region of imaginary space while being defined in terms of each other. This imaginary three-dimensional world constitutes the foundation of the performance environment.

The environment enables a real-time exploration of the evolving spatial patterns by modifying a number of parameters, including the global addition value and the shape of the neighborhood by selecting different patterns of neighborhood weights and enables the user to manage predefined computer graphics algorithms and audio synthesis definitions in response to the automata behavior. The current automata world consists of 4096 regions or cells – 16 along each of the three dimensions. This choice is rather arbitrary having more to do with limitations on real time computing power than any logical or aesthetic considerations and can be easily altered. Currently, only two cell neighborhood configurations are used as the weighting provides further options for different neighborhood configurations. The three-dimensional equivalent of what is known in cellular automata literature as 'Moore neighborhood' considers 26 nearest neighbors, including those diagonal from the center cell on the lattice. Figure 1 illustrates the Moore neighborhood in 2D, with the neighborhood surrounding the center cell shaded darker, and the equivalent in 3D with the center cell represented as a black cube and the neighboring 26 cells as wire-frame cubes.

System overview.

The system has been implemented in two separate parts. The automata world and graphics functions are part of a separate custom-written application, while the control center, audio synthesis and activation routines, and user interfaces for external control have all been implemented in the SuperCollider programming environment. The communication between the applications is managed through the Open Sound Control (OSC) protocol. Cell state values are used to generate audiovisual content during the performance. Due to the large size of the world and the high standard message rate (24 cycles per second), only a selection of individual cell values is polled by the SuperCollider application for audio synthesis mappings. This selection can also be specified and modified during the performance and it usually coincides with the selective visual representation of the cells. In addition, a global mean cell state and standard deviation for the entire world as well as mean state values for 8 sub-regions are calculated and sent out through the OSC client. The sub-regions are created by splitting the cube-shaped world in half along each of the 3 axes, thus creating 8 smaller cubes of 83 or 512 cells each.

Another dynamic feature of the automata world is linear interpolation of cell state values, which allows “time-stretching” the automata behavior by delaying the update function by a desired number of cycles. This feature allows slowing down the propagation of fast patterns when the addition value is set relatively high. Drawing functions are implemented as encapsulated patches, each with a specific characteristic. These patches can be easily added and modified during development and constitute a basic unit of the graphics application. Each patch has a number of parameters for transparency, color mapping and other values that can be controlled remotely. Besides the individual patch controls, global transparency, screen background color, zoom along each of the 3 axes, speed and direction of rotation, and relative rotation angle around each of the 3 axes can be controlled in real time. The added functions are expected to contain mapping logic from state values to audio synthesis parameters and can also be used to control certain parameters of the graphics application, creating parameter feedback loops during the performance. Audio synthesis definitions and time-structuring routines can be added dynamically during the performance either from predefined functions or specified in a live-coding just-in-time programming manner.

Audiovisual composition.

The audiovisual composition relies on two elemental concepts: audiovisual macro compositional entities called zones and the separation of audio and visual content within these entities both physically and conceptually. The concept of a zone emerged in the process of developing this project as a means to have a meaningful segmentation of considerably different audiovisual material and allows introducing new approaches to audiovisual mapping without restructuring the existing organization. Each of these zones can be activated in any sequence during a performance and, for better or worse, have provided a

general form for the entire composition. Each zone is characterized by unique and specific mapping procedures resulting in a distinct audiovisual entity.

The disparate networked structure of the environment keeps the conceptual and operational schism between the auditory and the visual. However, it is intended that neither is subservient to the other medium and both have an independent and equally important role in the composition. The two worlds are explored for their inherent characteristics and there is always a hint of a connection, at times seemingly synchronized and at others not easily identified. The 3D world is represented in computer graphics by mapping selected cell state values to low-level vertex drawing functions. Most commonly the cell state or inverse of the state is mapped to the drawn object's grayscale color, transparency and size. The variation of these three parameters already yields a significant palette of mapping options, considering that what really makes an impact in terms of the visual content are the intricate patterns that emerge even from the simplest of representations.

Audio synthesis parameter mapping is driven by the messages received from the automata world and handled through 3 different types of OSC responder functions as described in the previous section. A commonly utilized technique is to activate a number of parallel synthesis processes, identifying a certain number of modifiable parameters and mapping the incoming cell state values to appropriate mapping ranges for each parameter. Each synthesis process can have its custom mapping range for every selected parameter or synthesis processes can be grouped and the same mapping ranges used for equivalent parameters. The mapping ranges and curves themselves can also be modified during the performance, which provides even more powerful expressive tools for the performer. An example of the described mapping technique from the 'zone 1' section of the environment defines first a prototype synthesis definition for time stretching existing audio buffers with 8 modifiable parameters: overall amplitude, start read position in the buffer, end read position in the buffer, amplitude of the signal sent to auxiliary effects bus, pitch-shifting ratio, sound field rotation angles around the x-, y-, and z-axes (in terms of Ambisonics spatialization).

When the 8 synthesis processes are activated in parallel, each with 8 modifiable parameters, a cell states value responder function is added to the responder function evaluation queue containing instructions to map the incoming cell values to the specified ranges. Each time the SuperCollider language application receives a message marked as 'cell states', the function is instructed to clump the 64 incoming values into groups of 8, and then map each of 8 cell state values in a group according to the 8 parameter ranges and update the running synthesis processes with the obtained parameter values. Similar technique is used throughout the different zones, however, this is not the only method of mapping employed in the environment. Synthesis processes of shorter duration are also triggered according to received messages, for instance, and there are ranges of cell state values specified within which a certain process is active and is automatically switched off if a specific cell state goes out of that range. There are an endless number of alternative mapping strategies and as the environment is developed further, hopefully new approaches will keep surfacing.

Conclusion.

f(x) is an experimental environment, continually under development, exploring possible strategies for audiovisual laptop performance, in which the generative computer art paradigm is brought into the con-

text of live performance. Every performance on the system has so far produced distinctly differing outcomes, even though the introduction of the concept of 'zones' has channelled the performances into previously explored territories and encouraged the performer to favor certain system behaviors over others. In general, the environment fosters the idea of the composer/performer as an explorer or a discoverer, rather than a spontaneous creator. The design of the system tries to balance the amount of control and gestural character of the human performer against the distinctly non-human behavior of the automata world, simultaneously exploring the conceptual differences between the auditory and visual composition.

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PAYING ONE'S RESPECT TO A MOUNTAIN

ASTRID ALMKHLAAFY

Over the last three years I've climbed and mapped sacred mountains in Asia, as well as man-made monuments that refer directly to the cosmological. As an artist I fuse archaeology, legend, history and the site specific pilgrimage together – exploring on foot – while documenting with video, photography and GPS and react to the location through performance and later participatory installations.



Up&Down Installation, Night & Day Gallery, Nov. 09, Singapore, mountain and the Todorovics

“You must ascend a mountain to learn your relation to matter, and so to your own body, for it is at home there, though you are not.”

– Henry David Thoreau

INTRODUCTION

Over the last three years I've climbed and mapped sacred mountains in Asia, as well as man-made monuments that refer directly to the cosmological Mt. Meru and Mt. Sumeru of Buddhist and Hindu tradition. As an artist I fuse archaeology, legend, history and the site specific pilgrimage together – exploring on foot – while documenting with video, photography and GPS and react to the location through performance.

The mountain pilgrimage has become my lens into deciphering aspects of my new home. To share I create participatory art that attempts to poetically embody and translate my own experience to new audiences. In this artist talk, I will introduce my mountain treks in China, Indonesia and Cambodia and also discuss the challenges and successes I encountered in translating these site specific projects and performances into installation pieces.

TALK

This work draws on the tradition of Somatics, where direct experience and the body are key ingredients in exploring the inner world through physical engagement with location. It is also inspired by Yi Fu Tuan and his thoughts in *Space and Place*, where “the human person, who is animal, fantasist, and computer combined, experiences and understands the world”. As an artist much of my understanding of place is through walking. Artists including Francis Alys and his *Paseos*, Guy Debord’s *Derives*, Janet Cardiff’s audio and video walks and *Walkbook*, and Hamish Fulton’s walk art have also drawn on the walk as a source for their making.

The mountain has been my lens, specifically magical and mystical epicenters in Asia. Walking has been my way of engaging in these spaces. To understand my new home of Singapore, I climb through mountains of religion. There is something transformative about ascending, climbing, straining towards a peak, especially a peak with a temple perched on top, ideally along a path with hundreds of other climbers, that pushes my awareness out of my own experience into a synergetic flow of humanity. I've been drawn to these places that push my endurance and awareness. It is on mountain pilgrimages that my subjective experience begins to feel integrated into a larger awareness. This is hybrid practice-based research that attempts to combine approaches from interactive art, somatic bodywork concepts and experiential Aesthetics that includes site specific performance and translations in later installations.

“The ordinary man looking at a mountain is like an illiterate person confronted with a Greek manuscript.”

– Aleister Crowley.

The mountain as a pilgrim destination is not specific to any one region; it is an archetypal metaphor that transcends location and time. Think of Olympus, Ararat, Zion, Sinai, the temple at Delphi, the Tower of Babylon, Ziggurats, Pyramids, Manchu Piccu, Temples on Mounts, Mounds, Tells and so many other upward looking locations where we are inspired to consider if not engage in intense communication. We have real mountains where real gods reside, and man-made mountains where we see the achievements of civilizations. This holds true for the Americas, Africa, Australia and of course Asia. It is the mountains in Asia where my search began. It’s the small temples perched on hilltops, the monuments of Borobudur and Angkor Wat, and the gaze of the regions religions up to Mount Meru, Mount Sumeru, and Mount Kailas as well as the 5 peaks of Taoist China that make up the body of Pangu, the first living being and the creator of all in Chinese mythology

“Mountains are cosmological symbols of the divine human meeting, as well as the point of creation of community as well as cosmos. Depending upon the era, culture, and text, the cosmological emphasis on the mountain might be one or more of the following: the assembly place of the gods, the connection between heaven and earth, the center/navel of the earth (and thus the locus of creation), the locus of revelation.”

– Donaldson, Terence L., *Jesus on the Mountain. A Study in Matthean Theology.*

In the last four years I have climbed with video, cameras and gps, Mt. Taishan and Hushan in China, as well as the nearly erupting Merapi in Java, and manmade structures that represent Mt Meru and Mt Sumeru of the Buddhist and Hindu cosmologies, at Angkor Wat and Borobodur. Most recently I joined in the annual ceremony in Bali to Mt Batur and Mt. Agung, At each site, I reacted to the location by performing site specific performance walks, circumambulating structures, interacting with the flow of pilgrims or performing within the pilgrimage space. All of the walks have been documented with GPS and photography and often video.

Nearly all have been translated into print pieces that have been published and exhibited internationally. But I am drawn to the challenge of communicating on a more experiential and participatory level.

I exhibited my work of Taishan and Hushan in a three floor installation in Singapore. Drawing inspiration from participatory art and the book, *What We Want is Free*, I tried to create an experience for my audience that physically drew them into the concept of a pilgrimage, both the subjectivity of the experience and also with a taste of my own experience. I was fortunate to collaborate with video artist Kal Almkhlaafy as well as sound artist Darren Moore , both from LaSalle College of the arts in Singapore, in creating a more immersive environment. My success was less through media art, more through traditional exhibition. I had words everywhere and messages about mountains, pilgrimages and quests. The installation used three flight of stairs leading up to the gallery, making the journey up a mirror of climbing a mini mountain. Participants walked up the flights, holding handfuls of red sand which spilled through their fingers and painted the stairs red, again mirroring my own experience at Taishan, where I walked in red and 'painted' the mountain red by my walk. At the top floor, the participants added their sand to a mountain of natural sand that was already there. This mound was then painted red by those coming into the space. The most successful element was a wall of quotations that were velcroed in a grid. This was where people could take away meaning that resonated. The GPS tracts were displayed as soldered Plexiglas wall hangings, making the ephemeral nature of the walks made of a lasting material.

"Baudelaire writes: In certain almost supernatural inner states, the depth of life is entirely revealed in the spectacle, however ordinary, that we have before our eyes, and which becomes the symbol of it." Here we have a passage that designates the phenomenological direction I myself pursue. The exterior spectacle helps intimate grandeur unfold."

– Gaston Bachelard

CONCLUSION

When we seek a mountain, or enlightenment, and the Chinese equate the two, we seek our own center. The pilgrim goes physically on a quest to a location that represents the center of a universe, the universe as a whole, but also the center of the pilgrim. By moving outward we also move inward. By seeking we see ourselves from a new perspective, and in many of the instances that have been explored, that perspective is one of centering the pilgrim at the heart of the mandala. The axis mundi within.

And then how is this communicated? It must be documented well enough for clarity shared open enough for subjective interpretation

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SWARMING ROBOTS AND POSSIBLE MEDICAL APPLICATIONS

Mohammad Majid al-Rifaie, Ahmed Aber & Remigijus Raisys

In this paper a Swarm Intelligence algorithm (SDS) is introduced and the performance of a set of autonomous robots is observed. The robots agree on a task and despite the existence of 'organic' noise accomplish the mission through communication. The potential of using SDS in identifying metastasis from bone scans is also explored and a discussion on using swarming robots using SDS resource allocation/communication mechanisms is presented.

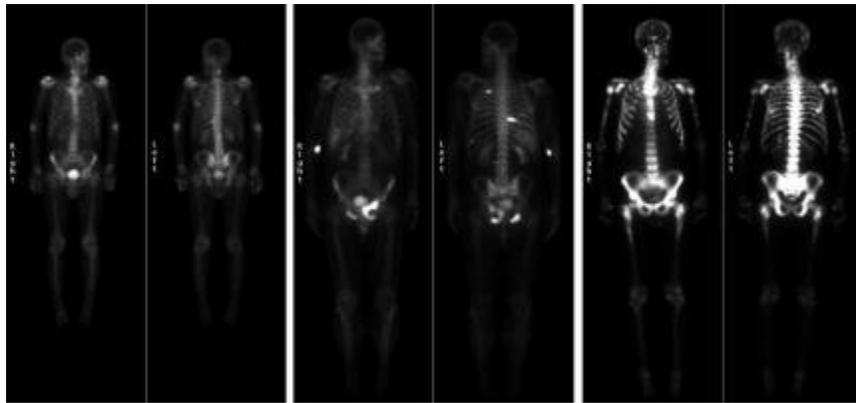


Fig 1. Bone images: typically 2-6 hours after intravenous administration of technetium-99m-labeled diphosphonates. Brighter areas indicate a higher radiotracer uptake. Left: Healthy; middle: partially affected; right: metastatic disease spread.

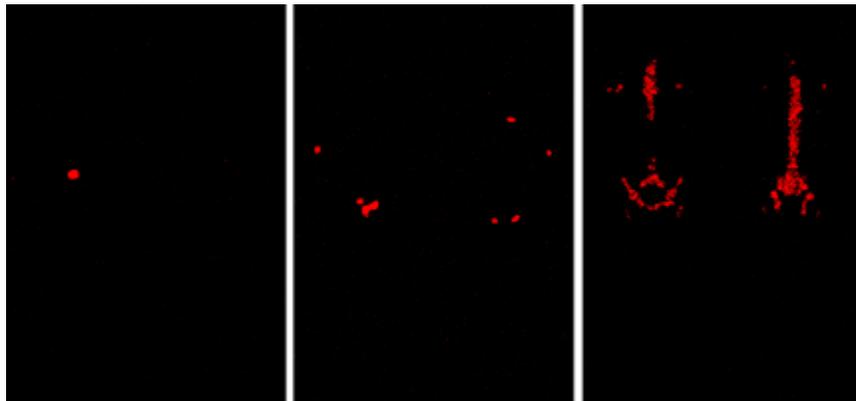


Fig 2. SDS-analysed bone images: The results returned by SDS agents after reaching 80% of activity. Left: Healthy; middle: partially affected; right: metastatic disease spread.

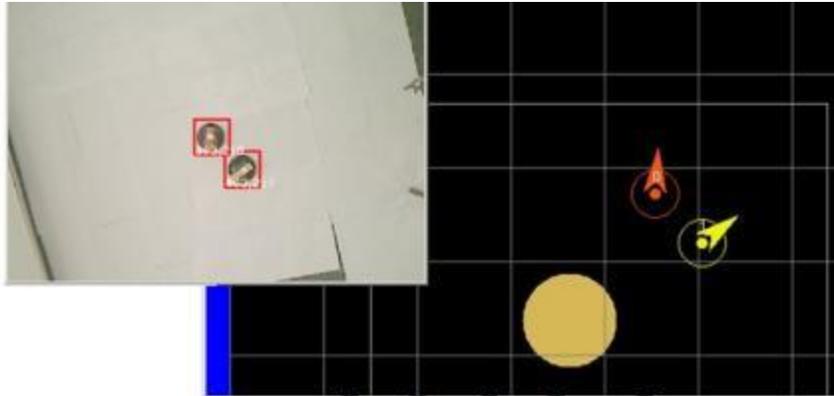


Fig 3. Snapshot of two swarming robots on the ground and in the simulator.

Introduction

Communication – social interaction or information exchange – observed in social insects is important in all swarm intelligence algorithms, including Stochastic Diffusion Search (SDS), [1] which mimics the recruitment behavior of one species of ants – *Leptothorax acervorum*. Although, as stated by James F. Kennedy and his collaborators, [2] in real social interactions, it is not just syntactical information exchanged between the individuals, but also semantic rules and beliefs about how to process this information, in swarm intelligence algorithms only the syntactical exchange of information is considered.

There are different forms of recruitment in social insects: it may take the form of local or global, one-to-one or one-to-many, and stochastic or deterministic mode. The nature of information exchange also varies in different environments and with different types of social insects. Sometimes, the information exchange is more complex where, for example, it might carry data about the direction, suitability of the target and the distance; sometimes the information sharing is simply a stimulation forcing a certain triggered action. What all these recruitment and information exchange strategies have in common is distributing useful information in their community.

In this paper, the behavior of the robots is explained according to the Mining Game metaphor, [3] which provides a simple high-level description of the behavior of agents in SDS.

The Mining Game

This metaphor provides a simple high-level description of the behavior of agents in SDS, where a mountain range is divided into hills and each hill is divided into regions.

A group of miners learn that there is gold to be found on the hills of a mountain range but have no information regarding its distribution. To maximize their collective wealth, the maximum number of miners should dig at the hill that has the richest seams of gold (this information is not available a-priori). In order to solve this problem, the miners decide to employ a simple Stochastic Diffusion Search.

- At the start of the mining process each miner is randomly allocated a hill to mine (his hill hypothesis, h).
- Every day each miner is allocated a randomly selected region on the hill to mine.

- At the end of each day, the probability that a miner is happy is proportional to the amount of gold he has found. Every evening, the miners congregate and each miner who is not happy selects another miner at random for communication. If the chosen miner is happy, he shares the location of his hill and thus both now maintain it as their hypothesis, h ; if not, the unhappy miner selects a new hill hypothesis to mine at random.
- As this process is isomorphic to SDS, miners will naturally self-organize to congregate over hill(s) of the mountain with a high concentration of gold.

In the context of SDS, agents take the role of miners: active agents being 'happy miners,' inactive agents being 'unhappy miners' and the agent's hypothesis being the miner's 'hill-hypothesis.'

Algorithm 1 -- The Mining Game

Initialization phase

Allocate each miner (agent) to a random hill (hypothesis) to pick a region randomly

Until (all miners congregate over the highest concentration of gold)

Test phase

Each miner evaluates the amount of gold they have mined (hypotheses evaluation)

Miners are classified into happy (active) and unhappy (inactive) groups

Diffusion phase

Unhappy miners consider a new hill by either by communicating with another miner or, if the selected miner is also unhappy, there will be no information flow between the miners; instead the selecting miner must consider another hill (new hypothesis) at random

End

Swarming Robots

One work by the authors, [4] is based on a project that involves the use of a swarm of autonomous robots to evaluate their interactions in the physical world (see the figures showing the robots and the simulator). The main channel of communication (one-to-one/one-to-many) is wireless. The goal of this project is to study and demonstrate the behavior of swarm robots using a decentralized control mechanism, where intelligence emerges through the interaction and communication among the robots, rather than just by the endeavor of one individual robot.

Each robot is fitted with a controller board (Arduino POP 168 micro-controller), with servo motors and other sensors connected to it. The wireless communication is facilitated by XBee modules. Each robot

has a label with a unique color, giving them a distinctive feature. For the system to recognize the robots, the OpenCV library is used to detect the color of each robot as well as the direction they are moving.

Following the Mining Game metaphor, each robot represents a miner and the location of the gold is defined on the search space with a uniquely identifiable label. The robots, which set off to search for gold, proceed with the communication and information exchange in wireless mode. At the end of each trial, as expected, the robots congregate around the gold location. In this experiment, the search space is just divided into hills; the hills were not divided into regions because of the small search space used for the experiment.

SDS and Bone Scintigraphy

Bone scan, or bone scintigraphy, is one of the most frequently performed of all radionuclide procedures. Radionuclide bone imaging is quick, relatively inexpensive, widely available, exquisitely sensitive, and invaluable in the diagnostic evaluation of numerous pathologic conditions. Although protocols vary among institutions, imaging is typically performed two to six hours after intravenous administration of technetium-99m–labeled diphosphonates. The delay between injection and imaging allows clearance of the radiotracer from the soft tissues, resulting in a higher target-to-background ratio and improved visualization of bone. The degree of radiotracer uptake depends primarily on two factors: blood flow and, perhaps more importantly, the rate of new bone formation. [5]

NORMAL SCINTIGRAPHIC FINDINGS

There is symmetric distribution of activity throughout the skeletal system in healthy adults. Urinary bladder activity, faint renal activity, and minimal soft-tissue activity are also normally present (see the bone scan figure - left).

The accumulation of radiotracer in bone generally decreases with age. However, there are sites of persistently increased symmetric uptake, such as the acromial and coracoid processes of the scapulae, the medial ends of the clavicles, the junction of the body and manubrium of the sternum (angle of Louis), and the sacral alae. Increased radiotracer accumulation in the jaw may be due to dental disease or to malocclusion of dentures. Symmetric areas of increased calvarial activity occurs in hyperostosis frontalis. In the neck, activity in calcified thyroid cartilage and in the apophyseal joints of the cervical vertebrae in patients with asymptomatic degenerative changes can also be seen [6] (see the bone scan figure - left).

METASTATIC DISEASE

Metastasis is the process by which the cancer spreads from the original site where it starts as a primary tumor to other tissues in the body, such as prostate cancer metastasizing to the bone tissue.

Many, if not most, bone scans are performed in patients with a diagnosis of cancer, especially carcinoma of the breast, prostate gland, and lung. Radionuclide bone imaging plays an important part in tumor staging and management. This imaging technique is extremely sensitive for detecting skeletal abnormalities, and numerous studies have confirmed that it is considerably more sensitive than conventional radiography for this purpose. [7] About 75% of patients with malignancy and pain have abnormal bone scintigraphic findings. The usual pattern consists of increased radiotracer deposition in areas of new

bone tissue formation in response to the damaging effect of cancer on the bone. [8] The presence of multiple, randomly distributed areas of increased uptake of varying size, shape, and intensity are highly suggestive of bone metastases (see the SDS-analyzed bone scan figure - middle). Although multiple foci of increased activity may be encountered in other pathologic conditions, it is often possible to distinguish metastatic disease from other entities by analyzing the pattern of distribution of the abnormalities. Traumatic injury, in contrast to metastatic disease, generally manifests as discrete focal abnormalities of similar intensity. In older patients, osteoarthritis and degenerative changes may manifest as areas of intense activity on radionuclide bone images. These changes can be distinguished from metastatic disease by virtue of their characteristic location; for example, knees, hands, wrists. Involvement of both sides of the joint is common in arthritis but unusual in malignant conditions. [9]

When the metastatic process is diffuse, virtually all of the radiotracer is concentrated in the skeleton, with little or no activity in the soft tissues or urinary tract. The resulting pattern, which is characterized by excellent bone detail, is frequently referred to as a superscan (see the bone scan figure - right). [10]

Bone scintigraphy is a popular and important imaging modality and will likely remain so for the foreseeable future. Although bone scintigraphy is not specific, its exquisite sensitivity makes it a useful screening procedure for many pathologic conditions, especially for the detection of prostate, breast and lung cancer metastasis.

SWARM INTELLIGENCE AND BONE SCANS

In this paper, the SDS algorithm demonstrates a promising ability in identifying areas of metastasis. [11] Each scan in the bone scan figure is processed by 10,000 SDS agents, which are responsible for locating the affected area(s). When the activity rate of the agents reaches 80%, the application terminates. The highlighted areas in the SDS-analyzed bone scan figure show the affected regions. According to the description given in the previous section, the SDS-analyzed bone scan figure (middle and right) are the areas of metastasis.

This technology can be effectively employed to develop programs for teaching and training medical students and junior doctors. Additionally the reproducibility and the accuracy of the SDS algorithm can be utilized in developing a standardized system to interpret the bone scans preventing operator errors and discrepancies.

Possible Medical Application with Swarming Robots

Robotic technology is enhancing invasive medical procedures through improved precision, stability, and dexterity. First experiences of using micro-robots in the human body came from the development of technologies to improve endoscopic procedures of the gastrointestinal tract. Endoscopy provides valuable information about any major pathologies; such as bleeding, malignancy or precancerous conditions in the gastrointestinal system. Typically, the widely used endoscope is composed of the head (active part) that incorporates the camera, optics and illumination and the shaft that allows the advancement of the instrument. By pushing and pulling over the shaft of the device, the endoscope advances inside the lumen of the gastrointestinal tract; however, these actions stretch the colon and cause pain during the endoscopic examination. In addition, despite advances in endoscopic technology, early precancerous conditions are still missed with fatal consequences. [12]

Robotics research has provided a solution for one of the major limitations of the conventional endoscopy by splitting the system and making the active part of the endoscope (camera, light) self-propelling inside the lumen while the control and energy equipments are left outside of the body, thus avoiding stretching the colon and limiting the abdominal pain. This is intended to minimize the pain that often limits complete examination of the colon.

For instance, in an advanced robotic system that is currently in use for in vivo endoscopic exploration of the gastrointestinal tract, an un-tethered camera pill is swallowed by the patient and then naturally moves through the lumen of the GI tract. This micro-robot contains an imaging device and light-source on one-side and transmits images at a high rate in a matter of seconds to a control device outside the patient's body. This generates a wealth of data over a period of a few hours. The images are sent from the capsule wirelessly to the control device. Images of the gastrointestinal lumen can then be analyzed either in real-time for immediate localization of the micro-robots or off-line for detailed diagnosis. [13]

As for the future medical experiments, micro-robots with similar properties will be utilized; these agents (robots or miners) will be identifying areas in the gastrointestinal lumen with any pre-cancerous pathology. In the initial experiments, the simplified case of having a pre-malignant condition, which is confined to an area in the gastrointestinal system, is explored. Micro-robots interacting based on the SDS algorithm provide a promising tool to identify pathological areas in the gastrointestinal system; with greater precision enabling a better a diagnosis and management plan for the patients. When optimization is involved, the integration of SDS with other swarm intelligence and evolutionary algorithms has shown promising results. [14] [15] The artistic aspects of this integration are discussed by the authors in the article *Cooperation of Nature and Physiologically Inspired Mechanisms in Virtualisation*. [16]

Conclusion

This paper introduced SDS, a swarm intelligence algorithm, through a social metaphor and presented some of its possible applications. The applicability of the SDS algorithm in identifying areas of metastasis are discussed and the potential of deploying SDS in developing programmes for teaching and training medical students and junior doctors is also considered. Possible areas for future research in using SDS with swarming robots are also explored.

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TEN YEARS AFTER

Franck Ancel

I therefore propose to create "Round Zero" an international platform at ISEA2011, "chess" or success. It depends only on you, Artists and Theorists, Institutions and Museums. I will not be in Istanbul due to shortage of funding for a plane ticket to be present in such meaningful occasion, but am and will always be available to share and exchange by email or other possible means.

"Ten Years After" was originally conceived as a combination of three proposals, a panel discussion, and a workshop over an article. It has resulted in a piece of text as it is now, because it was unable to receive the funding it would require after submitting various proposals to different French Institutes and bodies for international grants. (1) This is not the first time I have encountered such disappointing situation. For both the 2006 and 2008 ISEA conference, the French institutions were not very generous towards my participation in the ISEA.

Undeterred, I still tried my best this year, to propose a round table discussion, a workshop, together with this single text, exactly ten years after the events of September 11 in New York, here in Istanbul. Through words, I hope to imagine another way of inhabiting this planet; and through networks, I hope to look to the future as well as the past, and come up with a very concrete proposal.

At the last Web-Biennale in 2010, which was founded and directed by Genco Gülan since 2002 and held in partnership with the Museum of Contemporary Art in Istanbul, I was invited among other curators to participate in such alternative exhibition, and proposed a "**Zero Pavilion**".

My "Zero Pavilion" consists of ten links (2), all with a theme relating to the idea of 'zero' in the contemporary sense. These 10 links ranged from William Gibson's latest novel "Zero History", to "zero pollution", an idealistic environmental goal for private companies; from the experience in zero gravity in space, to the birth of the art group Zero, which is preparing a Guggenheim retrospective in 2013 in New York. There is an introductory text to explain of my intention, where everyone could contribute to the web pavilion through its open-frame nature.

Please be reminded that the theme of this Web-Biennale in 2010, was "anti-censor". For that I have specially presented the "Zero Pavilion" as a platform with 10 links to express my vision of a "Better Web Better Wor(l)d" designed with an open framework. This enable participatory updating from the public,

through which the pavilion could continue to renew itself. My proposal echoed the Shanghai World Fair 2010, during I initiated a virtual project to synchronize with the event. (3) Confronted by the fact that the French government invested the 50 million euros on building the French pavilion without offering a single place for artists, I created a proposal with zero euro on June 16, 2010 at the Art Fair, Volta, during which "Celestial Hopscotch", a performance I made, was broadcasted live on the Internet, between Switzerland and Iran, from Basel. (4)

It has been more than 15 years since the democratization of the Internet. Such change has revolutionalized the process of art making. "Net Art" has emerged since then around the world. It has been recognized and successfully absorbed into the discourse of Western Art, continuing the vein of life of a history, of which now is mostly confined to the walls of museums. And we know, Art can be without these walls and screens.

The current proposal "The Museum of Non-Visible Art" by James Franco from the United State will soon be presented in a cultural event in Europe. In many ways, it has revived a lot of principles inherited from the Fluxus, which has an ephemeral conceptual approach to art. So far these fluxus ideas have been manifested in the world of networks, but not yet in the museum, without wall or screen. The idea of the "Museum of Invisible Art" has redefined the concept of the museum and renders it an invisible ephemeral condition, extending its definition and reality to the state of concepts, thoughts and imaginations.

Another model for zeroness, which has also created a dialogue between the real and the virtual, is the digital database posted on the project of the Memorial Museum on September 11 in New York. Its mission is to provide a gathering place within a virtual gallery for artworks which are created in response to the 9/11 catastrophe by members from the community, ranging from seasoned professionals to inspired individuals from the public. It is the first time perhaps, for the public to express their reactions to 9/11 through multiple media: visual, tactile or auditory. (5)

In 2001, as a response to the New York 911 event, I had tried to put these different media and perspectives into my project, called "Aporie 11", which aimed to be collaborative and rhizomically free in structure. Not aiming to confine to one well-defined medium, it also did not seek for a catharsis. Apart from that, I have engaged with the event indirectly so that it questioned and challenged a lot of presumed irrefutable facts. It was an attempt, to move away from the traditional medium of art, the duality of the interior and exterior, the walls and screens, in order to point to a new direction for artistic research.

To respond to the dramatic event is what seemed to us almost essential. For it has updated a lot of questions and concepts about the world, such as the idea of eternity and its centre. **World-eternity-center** was the name of our ephemeral internet website, and together with a mail art project, which has

lasted six months. There was a monthly meeting on every 11 day of each month, so we have named it "Aporie 11".

To produce my research, theory and practice, I have allowed myself ten years of time, to focus on questions and answers not confined to only the physical walls of museums and / or the virtual screens of the Internet. The influence of the history of the avant-garde and neo-avant-garde has been decisive and critical to me until today. One of its founders, Marcel Duchamp had opened the door to other practices as a symbolic economy in art with the help of an invisible network of his contemporary and friends. Recent research by Miss Daniela Alina Plewes in this field through her university thesis is illuminating the relationship of the artistic exchange existing at that time. (6)

Marcel Duchamp has imagined a « failure system », not as an enterprise or business, to gain money at the Monaco Casino in 1925. For him to be permitted to play, so to live, Duchamp had spent a total bills of 500 francs (at an interest rate of 20%) as a starting capital. Each bill was signed by Marcel Duchamp and his female pseudonyme Rose Selayv. His friend, the photographer Man Ray has also been solicited to create the bill, with a reproduction of Duchamp as a devil. This work from Man Ray is a Dadaist joke. However, only Jacques Doucet and Marie Laurencin have been poetic enough to understand and invest in this action that relates art practices with economy.

To be specific, I tried to bet the last ten years of my life at the Casino of French Culture in a total failure. That is to say I have invested some money and time, to produce dozens of appointments and collaborations that seemed relevant between the reality and virtuality. Yet this creative freedom was met with futility in finding the space to work. However, sometimes I have satisfied some fetishistic collectors by selling them plexiglass boxes containing DVDs, remixing the arts from Yves Klein or Vladimir Mayakovsky.

In order to achieve my goal, I do not need any office, any infrastructure, but just a platform for collaboration, emails exchange and a banking account. Recently, the global news has urged me to conceptualise and realise two projects, with iPhone as an ideal medium of choice. One responds to the Fukushima catastrophe, named "Deserto Rosso" (7) while the other called "Space 140" (8) in resonance with the Tunisia uprising.

After more than ten years of activities, in fact, soon a quarter of a century, I still continue my research with humor, where now I have defined a new paradigm with the term the post-scenographic zerography. (9)

Looking at the operation of ANAT [Australian Network for Art and Technology], and from my experience, the whole world is at a crisis in almost every aspect, politically, economically, ecologically and culturally.

We are indeed at a critical point where actions need to be taken to envision a new economy based on a vision of the 21st century. This vision should not merely inherit from the past, but be radical and daring enough to create a break and rupture, for a more positive and creative future. And that is my good wish for the world.

Also, for the ten years of "Ground Zero", I would like to create a price "**Round Zero**", endowed with 10,000 euros. This allocation could be selected at random, like a virtual roulette. Though like a virtual roulette, it is with real money invested in it, and a concrete realization, without any constraint of curator or border in art.

The periphery of the art fair in Basel with its EuroAirport, the three countries, Switzerland, Germany, France, in the heart of Europe are ideal in providing the perfect place and context to showcase such a price. Of course, the creation of the artist will be chosen by drawing lots, and will take the form of an audible or visible action in the form of augmented reality. The production will be dependent on him, understood in these 10 000 euros.

In order to achieve that, I am looking for a company to develop an application on the iPhone / iPad or Android, and a cultural center and / or a gallery to produce and hold this event, which I consider a very serious artistic vision.

In regards to the proposal, the application we designed will accept an annual admission of 1000 subscribers. The price to download the application is set to a symbolic price of 10 euros. We identify the subscribers as voters with each having a chance to nominate one artist. From the 1000 subscribers to this club, together with donations accepted worldwide, we have 10 000 euros to create a scholarship for an artist drawn from the nomination list of registered voters. The EuroAirport (10) would be the ideal site in our context to create the first immaterial Art Fair, for the architectural site is composed of transparent glass walls that will inspire the provision of accounts and members open for this application/creation.

I therefore propose to create this international platform at ISEA 2011, "chess" or success. It depends only on you, Artists and Theorists, Institutions and Museums. I will not be in Istanbul due to a shortage of funding for an plane ticket to be present in such meaningful occasion, but am and will always be available to share and exchange by email or other possible means.

I am not boycotting the ISEA. But I defend for myself as an artist, and protest against the way the French Institutions allocate its fundings: please take note my empty chair as an invisible strike.

Now, if not too much, I only ask of you ten minutes, to meditate on my "Art of Silence" here: **OOOOOOOOOO** per minutes.

Lastly, thank you: Space and Love!

Corrected translation by Miss Heidi Ting

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IS THERE A CONCEPTUAL GAP BETWEEN ART AND BUSINESS?

CHRISTIAN ULRIK ANDERSEN & SØREN POLD

Communities of taste ('what we like') historically relate to changes in the production process. How does art respond to this? Three case studies will demonstrate how Marcel Duchamp responded to mass production, how etoy responded to a dematerialized Internet economy, and how Christophe Bruno on a meta-level has addressed the result of the artist response itself: the appropriation by marketing.

The silence of Marcel Duchamp is overrated. (Joseph Beuys)

The experience economy, as proclaimed by Joseph Pine and James Gilmore, highlights how aesthetic experiences producing human capital (that is, cultural, social, and symbolic capital) may be converted into financial capital, adding to the exchange value of a brand on a market. [1] In this, they perceive the aesthetic experience as 'icing on the cake.' In contrast, we want to emphasize how contemporary digital art practices incorporate critique, and may be business innovations in themselves.

As described by Kant, the judgment of taste is based on a subjective experience proclaimed as a universal truth 'we' share ('this is beautiful'). [2] The transformation from subjective experiences to universal statements produces communities of shared experiences, or 'communities of taste.' Our argument is that communities of taste relate to changes in the production process. For instance, with the introduction of photographic techniques, our perception of images changed. [3] People developed a taste for images that could be copied; easy-to-print snapshots, movies, and so on. With this, art lost its traditional aura of uniqueness, but art also reflected these transformations. Artists develop markets for newly occurring communities of taste that come along with changes in production processes. Particularly, we find this during times of major change. The following three case studies will demonstrate how Marcel Duchamp responded to mass production, how etoy responded to a dematerialized Internet economy, and how, more recently, Christophe Bruno on a meta-level has addressed the result of the artist response itself. Marketing often appropriates artworks that address the new communities of taste, how does art respond to this?

Fountain: Selling shit

The best-known artist exploring the relationship between art and capital is Marcel Duchamp. His ready-made urinal, or *Fountain* (1917), jokingly reflects how changes in capitalism and production affect taste (aesthetics). Belgian art theorist Thierry de Duve has argued that *Fountain* was all about selling 'shit' ('arrhe') as art; commenting on the result of everyone being an artist. [4] Duchamp had done nothing more than buy a ready-made unit from a manufacturer (J. L. Mott), produced by workers whose productivity was bought on the labor market. He rotated it 90 degrees, signed it R. Mutt, and submitted it to an exhibition. It was then sold to an art collector (Walter C. Arensberg) using a blank check, enabling Mutt to pay his credits to Mott.

The check was never cashed, and Duchamp remained independent of the forces of capitalism. However, this independence should not be mistaken for a romantic view of the artist. The introduction of the check into the masquerade is important to our understanding of how Duchamp treated the changes in

the production system, as it indicates a possible transaction of 'shit' into an infinite amount of money. In showing how to make art/money from shit, he was an entrepreneur, a 'phynancier,' as de Duve calls him, inventing a new market that is neither art nor business in a traditional sense. Though Duchamp never pocketed the money, the value of *Fountain* (or rather its reproductions, authorized by Duchamp) on the art market today says something about the potential of the artist's business innovation and speculation in the market.

Toywar: Mobilizing a community of taste

Works such as *Fountain* indicate situations where artistic disruptions in a market create new markets. Much later, within the field of net-art, this was experienced again. Around the turn of the millennium, the artists' group, etoy, disrupted the power relations of financial shares. Through their website, www.eto.com, etoy had for years played with a corporate identity on the Internet. Faced with lawsuits over their domain name registration by the toy retailer, eToys, etoy used the World Wide Web to mobilize their supporters in fighting eToys. Many activities took place, but most famous was the game *Toywar*. *Toywar* was very simple, and mostly a satire of corporate discourse. For example, it screened new players with questions such as: "Have you ever dreamed of being the opposite sex?" and "Did you ever wake up at night and realize you had real sick dreams?" [5] Some of etoy's actions, including an attack on their web servers during their Christmas sale, had direct consequences for eToys, but mostly, the success of etoy's actions rested on mobilizing people (almost 2000 enrolled) and the media attention it gained, affecting the broader public's taste and opinions. Ultimately, the most important score in the game was the stock value of eToys. This dropped drastically, resulting in eToy's collapse, and 'History's most expensive art performance.'

etoy had a remarkable ability to respond creatively to the sudden situation in which eToys put them, and demonstrated not only the strengths of an artistic business model, but also the dangers of ignoring it. Their activist war played on new markets with a taste for networked public participation, which inverted the power relation between the corporate and civic spheres. Though common in today's corporate communication, mobilizing people 'virally' through the Internet, using media tactically, was novel at the time. With the growing appearance of social web media in the last decade, this new market has proved itself a playground for marketing and new business ventures. Not only was *Toywar* critical of the power of global enterprises, it paradoxically also showed how to develop new markets on the Internet. How do artists respond when marketing appropriates art? [6]

ArtWar(e): Exploiting the hype-curves of taste

A decade later, net artist Christophe Bruno observed how his works, *Fascinum* (2001) and *Google Adwords Happening* (2002), had been appropriated by marketing. These works critically address the semantics of the web, and how Google takes over 'the market of the language,' but were echoed in Nicholas Sarkozy and Ségolène Royal's presidential campaigns in 2007. In concordance with how Google has capitalized semantics, for example, Google AdWords combines words with a monetary value, politicians are now using a 'panoptic ideology' and a 'remix of ideology' to assume control of 'a market of ideologies.'

In collaboration with the philosopher Samuel Tronçon, Bruno has applied mathematical logic, ludics and network theories to explain this transformation from art to market. In their project, *ArtWar(e)*, [7] they analyze how works of art (including *Toywar*), independent of their aesthetic value, enter a "scale free

network" where their popularity is dependent on laws of attraction, as opposed to randomness. The website essentially consists of a number of 'hype curves,' a term originally used to graphically illustrate the enthusiasm for new technologies over time – from over-enthusiasm, to disappointment, to economic implementation. "Hype cycles aim to separate the hype from the reality, and enable CEOs to decide whether or not a particular technology is ready for adoption," [8] it states on their website. The term is now used more broadly in marketing. In other words, *ArtWar(e)* reflects how businessmen are farming concepts and evolvments in the communities of taste.

The artist's response is to take control by making hype-curves for works of art, predictions of developments in taste communities. With some humor, Bruno even claims that *ArtWar(e)* is art, and hence implicitly suggests that the real response to the appropriation of net-art by marketing is to become a joking businessman. He employs the discourse of a CEO, and offers an opportunity to do "artistic risk management" and "computer aided curating." Bruno's art no longer involves working with the semantics of the web, which briefly characterized his earlier work, and was exploited by marketing. In order to avoid becoming an alienated laborer in an immaterial economy, the artist must become a businessman.

The three examples present the artists as businessmen. Duchamp reflected mass-production by creating an art market. etoy criticized the digital economy by assuming a fake corporate identity, and, caught in the act, they managed to employ a disruptive counterstrategy that, paradoxically, showed the world how to develop markets based on networks. As a meta-reflection on the appropriation of art by marketing, Christophe Bruno assumes the role of a stockbroker, calculating the stock value of taste. [9]

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THE KIND OF PROBLEM A SOFTWARE CITY IS

CHRISTIAN ULRIK ANDERSEN & Søren Pold

New urban interfaces introduce software to the city. To understand software cities we must compare the city with the software at a specific level. Building on the architect Christopher Alexander's idea of a 'pattern language' the article will present the activities that urban software fosters, and question how the underlying computational processes change the complex life forms of the city, and the response of urban planners.

The Kind of Problem a Software City Is

The final chapter in Jane Jacobs's *The Death and Life of Great American Cities*, from 1961, is entitled "The Kind of Problem a City Is." In it, she gives an account of the relations between urban development strategies and the progression of science. From being able to deal with problems of simplicity and disorganized complexity, science in the 20th century became capable of managing organized complexity. Statistical material and mathematics made it possible to manage a large number of variables as an organic whole. So-called 'urban renewal' projects were launched in both the United States and Europe to solve the urban problem of disorganized complexity. Slum areas that, according to statistics, had high rates of crime, infant mortality, and so on, were replaced with new and efficient infrastructures and a geographical separation of the use of the city into areas (residential, commercial, industrial, etc.). Several cities have been 'renewed' from the fifties onward by replacing urban areas of high complexity and diversity with new and functional areas of low complexity and diversity. Jacobs, however, claims that many urban planners do not know much about the actual interactions that take place in the city. [1] In contrast to this, they need "to think of cities as problems in organized complexity – organisms that are replete with unexamined, but obviously intricately interconnected, and surely understandable, relationships." [2] They must seek to think in processes that explain the general by the specific, rather than in statistical information that oppresses people and their relations.

In many cities today, the infrastructures no longer just consist of buildings, roads and paths but also of information flows embedded in software interfaces and networks (smartphones, tablets, wireless networks, surveillance systems, media displays, etc.). The software itself in many ways provides the means to effectively map out how the software city is used; for example, which smartphone applications are the most popular, what areas are under surveillance, or even the whereabouts and routines of an individual. Is it possible not to reduce our use of the software city to information overviews but instead focus on the specific use of the software city? Taking a lead from Jacobs, we need to ask ourselves what kinds of specific life forms occur in this environment and how we support their diversity and complexity. Architecture itself provides good techniques to do this.

A PATTERN LANGUAGE

In the 1970s, the architect Christopher Alexander, inspired by Jacobs, developed the notion of 'a pattern language.' A pattern is a way to summarize experiences, individual practices and practical solutions in a way that makes it possible for others to reuse them. Alexander's book comprises of 253 patterns, each with its own context, problems and solutions that sometimes help complete larger patterns or need

other patterns to be completed. As an example, Alexander uses the pattern ‘accessible green’ based on the observation that people need open green places to go to; but when they are more than three minutes away, the distance overwhelms the need. Consequently, green spaces must be built “within three minutes’ walk [...] of every house and workplace.” [3] This pattern helps fulfill larger patterns such as ‘identifiable neighborhood’ and ‘work community.’ [4]

According to Alexander, “towns and buildings will not be able to come alive, unless they are made by all the people in society.” [5] The general idea is that a successful environment depends upon an ability to combine physical and social relationships. The pattern language creates such combinations: it is a lively language, not exclusive to architects, that responds to the needs and desires of the people and thus connects architecture to people. Alexander’s book is a pattern language for towns, buildings and constructions, but this pattern language is only one amongst many. Any society, or even individual, will have their own languages to combine the physical with the social. However, the problem is that these languages are often not very sophisticated; people are unable to speak and must therefore develop their own language. [6] By suggesting that architecture and urban planning at the time was built on a language that was not refined, he implicitly raised the same critique of modern urban planning and architecture as Jacobs: architecture that is merely functional, and does not build on social relationships, is brutal. A successful environment must be sensitive to the needs, desires, hopes and aspirations of the people living in the environment.

If Alexander provided the beginning of a pattern language for towns, buildings and constructions, how developed, refined and sophisticated is our pattern language for software cities? To what extent do we build an awareness of our social relations, and not least our needs and desires for these relations, into the process of making the software city?

Alexander’s ideas have in many ways been more influential in the design of software systems than in architecture. This means that the pattern language for software development is quite sophisticated. Before we begin to critique the level of refinement in the pattern language of the software city, let us consider the experiences created in software development.

DESIGN PATTERNS IN SOFTWARE DEVELOPMENT (LESSONS TO LEARN)

Design patterns in software development express a relation between programming, design, and use. This is particularly evident in the Scandinavian participatory design tradition, which in the 1970s had already begun to focus on how to bring the different stakeholders of a workplace into the process of system development. Participatory design not only includes the design of human-computer interfaces but also the technical parts of system development. Ward Cunningham, a pioneer in this field, initiated the Portland Pattern Repository that in the mid-nineties was accompanied by the WikiWikiWeb: the world’s first wiki. It consists of numerous patterns that, using the schemata of Alexander in general ways, describe problems and solutions in graphical user interface design and programming. [7]

‘Ward’s wiki’ became popular because it allowed programmers to share and co-edit their experiences. By using this, they developed a sophisticated pattern language that combined the human use situation with the structure of the program; similar to Alexander’s vision of a pattern language for towns, buildings and constructions. The combination of physical and social relationships has, however, also been corrupted along the way.

Firstly, the sharing of a language, which was the starting point for the Portland Pattern Repository, has partly disappeared. With the exception of open and free software projects, the code of software is copyrighted and not accessible to other programmers. Secondly, and partly related to this, interface design patterns seldom combine the physical and social relations in an 'open' way. In today's interface design it is compulsory to meet the user at eye-level in order to combine the physical and social relations in a 'useful' way. Software successfully responds to the needs and desires of its users to write text, edit images, collaborate, socialize, play, and so on; and developers regularly consult its users via interviews, questionnaires, supervising debate forums or even by letting them produce add-ons to their program, like apps in Facebook or macros in *World of Warcraft*. However, it is not desirable to discuss our social relations merely in terms of 'ease of use.' Social relations demand openness to the actual patterns of the users. The patterns of use should not only encompass user-friendliness but also other ways of using, including unintentional use and even oppositional or critical use. If not, pattern language does not respond to the needs and desires of social life.

Massive multiplayer online games illustrate this very clearly. Here, life is obviously not restricted to what is 'in the box': participants produce strategy guides, additional stories, make t-shirts, etc. However, game developers will often try to seize control of these activities. One example of this is the *WoWGlider*, a third-party program that automatically controls a player's character via scripts. The program, and similar 'glider bots' are popular because they allow players to acquire game skills without being present in the game. In 2006, a "high ranking officer of Vivendi" and a lawyer for both Vivendi and Blizzard (the game developers of *World of Warcraft*) approached the maker of *WoWGlider* (Michael Donnelly) at home, and accused him of violating their copyrights. [8] Later, they also filed a lawsuit and his company was eventually sentenced to pay Blizzard six million US dollars. This is just one amongst several examples of how the interests of players and game developers are in conflict. It has nothing to do with the usability of the game but is entirely a political issue: in order to protect their software and develop their business, developers prohibit certain types of behavior.

Today, software is no longer just for work but a platform for social life, and examples similar to *WoWGlider* are growing in numbers. The challenge for participatory software design today is to not only include people's use in the design of software but also openness towards creative and alternative use. In this, political issues concerning ethics and ideology become increasingly important, and conflicting interests and unbalanced relations of power and control often restrict the development of a lively pattern language. Successful examples are rare, but are, for instance, found in the FLOSS movement (Free/Libre Open Source Software) that explicitly combines the openness of technical structures to, for example, individual freedom and the refusal of intellectual copyright. [9]

The software city is to a large extent a non-work context where issues similar to the ones that are noticed in social software are relevant. In developing a pattern language for software cities, the first step is to critically evaluate the way we currently combine the physical with social relations (technical infrastructures with the complexity of life), in the software city. Experiences with both social software and FLOSS are valuable in this context.

PATTERNS IN THE SOFTWARE CITY

The standard image of a software city is somewhere where media saturation is obvious and clearly visible, like Shibuya in Tokyo or Times Square in New York. However, less spectacular implementations of software in cities also demand attention.

We have previously studied the digital layers of the mid-sized Swedish town Lund. In general terms, we found that software is embedded via 'log-in spaces' (as found in restricted networks of various sorts) and 'iSpaces' (as found in the individual use of personal and mobile laptop computers, tablets or smartphones), paired with a 'hypertextual connectivity' that connects physical space with virtual networks (as found when, for example, a location-based smartphone application links to a social web service). [10] Both log-in spaces and iSpaces suggest that the migration of software into urban space propagates two kinds of activities: surveillance and configuration.

As a general pattern, surveillance is not only visual but also structural. Surveillance does not only take place via cameras but also, and more often so, by following seamless transactions: for example, when logging on to a network, transferring money, or using personal identification numbers to keep records.

As a way of interacting with software, configuration means to change a system on a user level, including actions as diverse as image editing, setting software preferences or shooting monsters in a computer game. Configuration patterns are found when we use the software city to play games, socialize via services such as Facebook or Twitter, find weather reports, use a GPS for creating routes, etc.

Surveillance and configuration patterns reflect two particular and interrelated views on the public sphere: 1) When public wireless networks are restricted and its users tracked it is to avoid violations of copyrights, illegal conspiring, terrorism, and so on. Hence, surveillance fulfills a need to protect land and property. 2) When I, using my smartphone apps, can find information about the place I am, connect to my friends anywhere in the world or track my whereabouts and share them in public, the configuration pattern fulfills a need to support the exercise of the individual.

In this sense, inhabiting the software city is like inhabiting *The Sims*. The ability to perform as an individual in this environment is equal to the sum of acquired platforms (smartphones, credit cards, laptops, etc.) and applications (location-based guides or social networking software such as Facebook, Foursquare or Twitter) one possesses – similar to the acquirement of objects as a way to increase one's character level in a game. Every action is registered by the system, and you are given the right to configure the system, but you are never given the right of a citizen to negotiate the system itself. The problem of the software city is the same as in many computer games: life does not always fit into the box of the game. Actions such as evading surveillance, hacking networks and disrupting configurations are often considered illegal. Even common practices such as information sharing is considered a violation of copyrights. In this sense the physical infrastructures of the software city do not always correspond with the social practices and desires of the people. At the same time, we must also consider that life in the software city fits surprisingly well into a box. People do not mind 'living in *The Sims*.' Surveillance is widely accepted, and though CCTV is often part of public debate, registration of computers, tablets or smartphones on the Internet is widely accepted; which is similar to the tracking of money transfers when people use their credit cards or smartphone apps for Internet banking. Likewise, people generally do not critically evaluate their use of location-based or social services for their smartphones, as long as there is a benefit to them.

To discuss the software city in terms of 'ease of use' may prevent the development of a diverse software city. The software city must therefore encompass the idea of citizenship, where the combination of iSpaces or log-in spaces with our social relations can be debated openly and lead to new visions. This development of a shared pattern language for the software city also implies critique of urban planning.

PLANNING THE SOFTWARE CITY

Though our use of software in the city is rarely planned, the software cities themselves are planned, and are usually thought of as ‘smart cities’ and ‘media cities.’

Smart cities cover a range of initiatives. The general idea is that a city’s performance is dependent on its ability to support and include aware citizens in issues such as economy, governance and sustainability. This demands that, for example, the people can be smart: that they have the necessary infrastructures to communicate, a high level of education, a pleasant environment with secure health systems, no crime and a rich cultural life, and so forth. [11] This is supported by current developments in software, for example, cloud computing, where services are offered via a network and thus support the mobility of the citizens. However, city planners and governors can also use software for data monitoring, analytics and visualization to sustain the smart city. This may include a wide range of services that compute and visualize data for crime, education, traffic, energy consumption, etc. These are not only management tools but are also tools that involve the participation of the citizens, such as, for example, reporting the water quality via a smartphone application. [12] The general idea is to not only anticipate but also innovate through data analytics.

Smart city initiatives appear to combine a city’s physical infrastructure with its social and intellectual capital. Learning from our critique of the use of patterns in software development, we must however also realize that in the smart city urban life is programmed into the software in ways that do not always correspond with the citizen’s practices, needs and desires. To develop a sophisticated pattern language we should not only debate the ‘usability’ of cloud computing or how monitoring systems make a ‘safer world’ (patterns of surveillance and configuration), but also some of the issues that are at stake in social software. Smart cities, for instance, heavily affect our perception of private and public. In other words, we need to reflect on what a common good means; who owns the data; what it is used for; when it is public/private; how it is monitored; how it is visualized; what data visualizations are used for, etc.

Media cities involve using software as a spectacle that can evolve new neighborhoods. The urban renewal project MediaSpree in Berlin is an example of this, out of many across small and large cities. In the past decade, large property investments have been planned along the banks of the river Spree in the Eastern parts of Berlin. The aim is to create high profile architecture that integrates media, small and large-scale use with public access to the river. [13] For various reasons (including lack of capital) many of the MediaSpree initiatives have been interrupted and several places are temporarily occupied by cultural initiatives; including the Berlin techno scene and clubs such as Club Maria, Berghain, Bar 25 and Tresor. In MediaSpree, the integration of media in architecture via displays and façade media is aimed at creating a spectacle that attracts people. In contrast to this, the media integration of these clubs is almost invisible at street level, but nevertheless very evident. The club scene is part of a global network of electronic music enthusiasts, connected via blogs and other services for cultural co-production. Every weekend thousands of people fly to Berlin to take part in the scene. Even though the club scene is not a clearly visible architectural landmark, indeed it often strives to be invisible, it is a lively part of Berlin and an attraction that possibly even outshines many of MediaSpree’s initiatives in terms of city life and branding. [14]

The smart city and the media city each in their own way demonstrate how the software city often is controlled top-down by corporate and urban planners. However, the development of a diverse software city

does not have to be spectacular or ‘smart.’ Although media architecture, cloud computing and data visualization should not be dismissed, there is a need to focus on the spaces in-between that do not have clear ownership, areas “devoid of meaning,” as the Danish sculptor Willy Ørskov has defined the ‘terrain-vague’; spaces that can be of potential significance. [15] These spaces may be physical locations, like the banks of the Spree, but they may also be spaces for new software-based practices. It is in these spaces that we see glimpses of the software city as something other than just log-in spaces or iSpaces. In other words, there is a need for a new pattern language for the software city that is based in emergent cultural practices appearing in the terrain-vague; a language written by people, rooted in their practices and a sustainable combination of social relations with the physical infrastructures of software.

ACKNOWLEDGEMENTS

This research has been funded by the Danish Council for Strategic Research, 09-063245, (Digital Urban Living).

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CIRCLES AND PROPS - MAKING UNKNOWN TECHNOLOGY

Kristina Andersen & Danielle Wilde

The OWL project is an evolving interrogation of how we might imagine technologies that do not yet exist. The paper describes the theoretical background and structure of a series of workshops aimed at allowing participants to create their own personal technological fantasies. We explain the background for each conceptual shift in the process and attempt to outline how and why they may work.



Fig 1. Owl circle workshop, Sydney 2010, photographic media, © Kristina Andersen & Danielle Wilde



Fig 2. Owl circle workshop, The Mastification Amplifier, Sydney 2010, photographic media, © Kristina Andersen & Danielle Wilde

How will you go about finding that thing the nature of which is totally unknown to you?

Meno, from Plato's dialogue (in Solnit, 2005) [1]

Any sufficiently advanced technology is indistinguishable from magic.

Arthur C. Clarke, *Profiles from the Future* [2]

The Unknown

It is almost impossible to imagine what lies ahead. What will the future bring? How could life be different? The OWL project is an evolving interrogation of how we might imagine technologies that do not yet exist. How can we support the emergence of radical future technologies that reflect and respond to our personal desires? Asking someone to imagine yet-to-be-imagined technologies puts a large strain on our ability to bring ideas into being. What do you really want, if you could have anything? It is an awful question to ask and when you do, you will mostly get simple, modest answers. In the quote above Meno asks how we will go about finding that thing “the nature of which is unknown to us.” [1] The OWL Circles were created as an attempt to find a way to blot out the most immediate answers, so that we might access more instinctual, and perhaps less plausible responses.

The Circles are purposely designed as a way to sneak up on ourselves, to be caught unaware and unself-conscious for a moment so that we dare to begin. Our aim is to elicit nuanced, imaginative and implausible responses that challenge and stretch what we consider to be possible. We begin with the body and use ideas of enchantment, ambiguity and play, as vehicles through which to contemplate Meno’s question, and thereby support the conception of “sufficiently advanced technology.” [2] The Circle workshop experience takes the participant through a rapid series of formalised conceptual shifts, that each draw on large areas of work in theatre and performance theory, game-play and motivational psychology. This paper is an attempt to account for these shifts and the body of work that lies behind them.

The OWL Circle Workshops

The purpose of the OWL Circles is to allow participants to create their personal technological fantasy. They are hosted in a neutral, utilitarian space, containing a large shared worktable with various tools and lights, and another table, off to the side, containing various neatly organized recycled materials. Neutral colors predominate. The materials are chosen to afford a large range of structural possibilities and aesthetics. A small area is also set up for video interviews, with a video camera on a tripod in front of a black wall. Ideally, the circles are conducted with twelve participants and two workshop facilitators. The format has evolved until it was reduced to the following, strict sequence of conceptual shifts:

- Introduction: Welcome and brief introduction, including the reading out loud of the quotes from Arthur C. Clarke and Meno. [1] [2]
- The Desires: A list of common desires are read aloud and placed on the table in the form of index cards. [3] Participants are asked to choose one.
- Transfer to Body: Participants are asked to identify in which body part their chosen desire resides.
- The Material Switch: Participants choose materials they find appealing.
- Thinking with Your Hands: Without knowing what to do in advance, participants begin making.

- Being 'Done': When they recognize that they are 'done,' each participant is led to the video interview corner.
- Description: While being fitted with a microphone participants are instructed to tell us: their name, their desire, what their object is called and what it does. The answers are filmed in one take.
- Debrief: A short debrief is performed to complete the process

What is Happening?

In the following we explain the background for each conceptual shift in the workshop process and attempt to outline how and why they may work. The main component is a series of estrangement switches that shift the mindset of the group away from the predictable and towards a temporary moment of otherness.

THE INTRODUCTION:

The introduction functions as the drawing of a circle or the beginning of a game and as such it serves a number of functions. In a theatrical sense, it declares that a game is beginning. Caillois specifies a number of characteristics for games: they are engaged in by choice; they are separate from the routine of life, and occupy their own time and space; games are uncertain: the results cannot be predetermined, the players' initiative is therefore required; games are unproductive: they create no wealth and end as they begin; games are governed by strict rules that suspend ordinary laws and behaviors; and, finally, they involve make-believe that confirms in players the existence of imagined realities that may be set against 'real life.' [4] By framing the circle as a game, Caillois's characteristics automatically come into play. This liberates qualities of attention and engagement that are useful when trying to find "that thing the nature of which is unknown," [1] while Clarke's assertion that "any sufficiently advanced technology is indistinguishable from magic" [2] further emphasizes the game-like quality of what we are trying to do; at the same time as it focuses our quest into the realm of technology.

THE DESIRES:

The list of desires that we use is borrowed from Steven Reiss's research on motivational psychology. [3] Reiss's desires are usefully provocative: they reduce a complex emotional field down to someone else's shorthand definition of the world. They also introduce language before we know what we might be describing, and thereby provide an uncommon point of departure for an embodied discovery process. Choosing to approach a difficult subject in a complex or convoluted manner is a common strategy of fine art. The underlying assumption is that to 'free up' the creative and expressive body to respond to the unanswerable, we must first 'busy' the reasoning part of the brain so that it will not interfere. [5] The sparse, yet strict instructions that we provide act as a structure that engages the reasoning part of the brain; freeing participants to be spontaneous, to follow their intuition, aesthetic scents and creative whims. [6] It allows them to trust and follow their instincts. The list of desires acts as the first estrangement switch, and is followed very closely by the next conceptual shift: the transfer to the body. Importantly, the facilitators remain neutral throughout, accepting all choices as equally valid.

The list of desires is:

- Acceptance, the need for approval

- Curiosity, the need to learn
- Eating, the need for food
- Family, the need to raise children
- Honor, the need to be loyal to the traditional values of one's clan/ethnic group
- Idealism, the need for social justice
- Independence, the need for individuality
- Order, the need for organized, stable, predictable environments
- Physical activity, the need for exercise
- Power, the need for influence of will
- Romance, the need for sex
- Saving, the need to collect
- Social contact, the need for friends (peer relationships)
- Status, the need for social standing/importance
- Tranquility, the need to be safe
- Vengeance, the need to strike back/to win

THE TRANSFER TO BODY:

“Where in your body does your chosen desire reside?” This question acts as a second estrangement switch, transferring from, and connecting, desire to body. It is a nonsensical question that draws heavily on surrealist art strategies, liberating in their absurdity. [7] “If you were a color what colour would you be?” Children know this game and have answers for these types of inquiries. The switch between an abstract desire, defined very strictly by someone else and the feeling that this word does indeed reside within your body, allows the participants to begin to work. The question is no longer abstract: it has been made concrete and physical. This clear concept now becomes the participants’ guide in the work.

THE MATERIAL SWITCH:

“Find the material that works for you.” This instruction acts as the third estrangement switch and allows the physical making to begin as participants find physical form and texture for the body-feeling that has been identified. Again, the decisions made here are not reasonable, rather participants continue their line of absurdist questioning by asking, “if this feeling had a texture and a shape what would it be?” This process exposes unexpected and poetic possibilities that can be explored from the specific sensory potential of a material to body behaviors as they rise from desires, feelings, and anxieties. Dr. Montessori of course famously used blindfolds in reviewing materials, stating that the eye can interfere with what the hand knows. [8] We could add that language can interfere with what the hand knows. Once the participants have chosen materials, they can begin to build and support their burgeoning concept.

THINKING WITH YOUR HANDS:

Through the making process the work is one step further removed from reasoning and habitual thinking. The participants have up to this point made three very large leaps of faith: choosing a desire, connecting this desire to their body, and their as yet unnamed feeling to a material texture and expanse. These three switches have occurred in less than fifteen minutes, allowing no time to re-consider or back out

into careful reasoning. In a sense, participants are not completely committed at this point, simply because they do not know what it is that they are making. The work that follows is instinctual and effective. The conversation around the table is practical: "Can I have the scissors?" "How do I make this stick out to the side?" [9] Kelly claims that the divorce of the hands from the head puts a strain on the human psyche. [10] This suggests that bringing them back together again through embodied processes releases strain. Having viewed numerous circle participants engage in this process, we suggest that the state that it engenders is tranquil: focused, efficient, relaxed and also gently energetic. Thinking as an emergent bodily process allows us to access knowledge, expertise or connoisseurship that otherwise eludes articulation. [11] The OWL processes leans heavily on this idea.

BEING 'DONE':

Knowing when a device is 'done' is an instinctual knowing. The circle structure removes verbal reasoning from the imagining and creating process, and frees the participant to trust their ability to recognize what it is they are doing as it emerges, including when it is 'done.' This knowing 'when' is something we all have experienced, Henri Cartier Bresson called it "the decisive moment," the moment when the trigger on the camera is pushed. This moment relies on the photographer's ability to see and record an event literally taking form in the immediate future. [12] Cartier-Bresson's decisive moment was tied to a particular approach to photography, nonetheless it is useful to provide ways of thinking around the notion of making a device which is yet to be imagined, and knowing when that device is 'done.' In musical improvisation, the knowing where to go next becomes a series of small decisions made in a hyper aware state of flow in which the musician 'knows' both the minds and desires of his or her fellow musicians, and also holds the experience of the audience as an almost physical thing which can be examined, turned, changed, and at some point is 'done.' [13]

DESCRIPTION:

The interview is filmed in one take. Participants are required to think on their feet, to not let their inner dialogue drown out their ideas. We began with language, with the desires and now we return to language again. The process between is embodied, non-lingual or mute. As language floods in, it takes over, surprising the participants. Excluding language from the central part of our structure allows a very intuitive and productive process to emerge and only at the end is reasoning allowed back into the experience. In order to allow this process to appear "on camera" we ask the participant to speak in one-take with minimal intervention from the camera operator. This achieves two things: first it allows the process to remain personal and introverted, the camera operator is just that, an operator facilitating the participant to self-record their piece; and secondly, the switch between an intuitive and wordless making process to a reasoned presentation happens 'on camera,' with many participants only realizing what they have built as they name it. To make this final switch more distinct we ask strict, product-like questions. Instead of, "how did you feel?" we are asking, "what does it do?" The strictness of this line of enquiry allows the sometimes hazy decision making process that has come before to crystallize out. The 'product' is described and the participants are thereby brought back into the everyday world. The circle is broken and the game is over.

DEBRIEF:

As a postscript to the overall workshop experience, each participant is debriefed before leaving the workshop space. This allows us to close any conceptual holes, attend to any concerns the participant might have and is an important part of us taking responsibility for the emotions and questions that may arise in an intense experience. It is also where we can explain a little bit more about the background and reasons for the project.

The workshop takes two hours, including the recording of all twelve participants' work. In that time we have opened a bubble in time in which we were allowed to physically build what did not previously exist, and in turn meditate over our desires, and how they might be met or mitigated.

Nine circles have been conducted to date: three in Tokyo and six in Sydney. Five of the Sydney workshops were targeted towards specific social or community groups: artists with disabilities and their carers; design academics; young children; performing artists; librarians. The outcomes were exhibited as part of the 2010 Participatory Design Conference in Sydney. [14] The breadth of participants and contexts afforded deep reflection, and the development of the strict structure described above. The whole process shifted the way that people thought about and imagined their bodies in relation to technology. The results were not only enchanting, but were deeply felt. [15]

Some Conclusions

Susan Stewart, in her book *On Longing* proposes that souvenirs are objects of desires that assist in the formation of continuous personal narratives that connect the present with the past. [16] OWL objects and devices connect participants through their imaginations and desires, as well as through the objects themselves, from the present to the future. They give form to, and assist in the formation of continuous, or ongoing personal narratives that support this connection. [17]

The workshops themselves are live, volatile processes, understood in the sense of Dewey's 'experience.' [18] We work with ideas not just in the form of description, where only language can become knowledge and meaning, but rather as a 'process of becoming' that, without turning to either romanticism or mysticism, can allow what may appear as chaos to create order and pattern through embodied experiences. Judith Butler states that we are required to, "risk ourselves precisely at moments of unknowingness, when what forms us diverges from what lies before us, when our willingness to become undone in relation to others constitutes our chance of becoming human." [19] The workshops are purposely built to facilitate this kind of risk taking, to provide a temporary space in which we can 'become.'

In Viktor Shklovsky's view, art resists and overturns the deadening effects of habituation. As our "perception becomes habitual," he argues, "all of our habits retreat into the area of the unconsciously automatic" and as a result "we apprehend objects only as shapes with imprecise extensions." [20] Art promises to recover the sense of immediacy and wonder that habit slowly erodes: "The purpose of art is to impart the sensation of things as they are perceived and not as they are known." [20]

The OWL project confronts desires, bodies and dreams about technology. It affects a displacement of desires, by naming them and giving them form, but it also affords giving account from the place Butler speaks of, the place where we become and remain human. The objects that are made are a kind of souvenirs from the future, but where souvenirs remind us 'what happened then' the OWL objects carry stories about 'what happens next.'

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CRISIS NARRATIVE OF LANDSCAPE

LISA ANDERSON

Landscape is a construction of the mind within the contemporary world. The elements of nature, ecology, urbanity, the sublime, and even the profane swirl across the surface in the scars, reflections and symmetry in a cacophony of colors put forward in the elements we call landscape. I narrow my landscape to consider the changing stories being created, heard or repeated that reference weather.



Fig 1. The Gates of Bei Gao. Still from video. Lisa Anderson, 2011



Fig 2. Wheatered Edges #4. Digital Print. Lisa Anderson, 2011

 IS NATURE IN ME OR AM I IN NATURE [1]

Landscape is a construction of the mind within the contemporary world. The elements of nature, ecology, urbanity, the sublime, and even the profane swirl across the surface in the scars, reflections and symmetry in a cacophony of colors put forward in the elements we call landscape.

The Landscape I am mainly concerned with touches on all of these elements, however, I narrow my search to consider the changing stories being created, heard or repeated that reference weather.

The weather literally shapes the land, the architecture, the color of the sky and the density of the waters. The weather and its archive highlight the depth of history through challenging and shifting story telling about place.

As people, animals and plants migrate across the world, often pushed by the extremes of weather, the stories of particular places also change. The story we over-whelmingly hear now is one of disaster, of extinct species and of the forced movement of people. Often these disasters are the result of human challenges and scientific overcoming of weather and land.

However, the disaster elements like all good stories are told in many ways; within this chapter is the relatively new understanding of people as separate from nature, something perhaps embodied in Thoreau's influential understanding and books about wilderness, as nature. We see this in the idea of frontierism, where we became the conqueror with a civilized attitude that was outside nature. [2]

The idea of nature as a separate part of the ecology – and this is discussed in detail by Tim Morton in *Ecology without Nature* – suggests that we become aligned with the potential to divorce ourselves from any common good or shared experience with the land. We are encouraged in frontierism to create log cabins in inhospitable places, cut holes in the earth, shift tonnes of carbon from one side of the globe to the other, to take up residence on Mars as a future for the planet. That is scrap nature and start again policy. Just expand the frontier. [3]

Thus, my own aesthetic context and action includes looking closely at the stories of place that are often told in indigenous communities as both a keening for a past and a record of what happened. These stories feed an understanding that at times keeps pace with the weather changes recorded. This is the science of proving the winds and rain, the record of temperature and earth-shifts. The science of geology is reflected in the stories of the peoples over time.

For instance, many years ago there was a plan to mine a certain hill/ridge in remote Australia. The local peoples' stories forbid access to the site as sacred. It was the dreamtime sleeping place of a monster native frog. The last time the frog was awoken, the earth was separated and the frog vomited across the land with the soft surface soils washing away to the sea and leaving behind a dry desert; the people, animals and plants had to move or adjust. Thus, to disturb the frog would cause trouble across the land as again it would vomit. Eventually, despite the sheer disbelief that fear of a vomiting frog would stop big business mining, which is the all pervasive force in Australia, the rights of the traditional owners was upheld by the High Court.

The giant frog stays sleeping in the hill. It is worth pointing out that they wanted to mine uranium. Recent disasters around the world, such as the Tsunami on the coast of Japan that caused untold damage to the environment stemming from the Uranium fuelled power stations, could in legend be the result of a vomiting frog; or any similar legends that exist around the world.

These stories abound, and we ask ourselves who tells the story of the *Crisis in Landscape* now? Was it James Cameron in *Avatar*, where good and bad were depicted as government and big mining (very Australian that), and memories are stored in a tree with cloud-like qualities? [4] Or, is the story of Landscape told by David Attenborough, who whispers to us the details of shifting creatures across the planet? [5] Or, is it in the new geology comparisons in the TV series *The Universe* comparing our landscape with that of other planets as a goodbye wave at the past and a jump to the future? [6]

Within the potential TARDIS of the Internet we have many stories of landscape, with a hierarchy of stories shifting from the scientifically proven, to the stories we, as a people want or are willing to make up and share.

My recent video work *The Gates of Bei Gao* is created in the small hutong or suburb in the North of Beijing. This area has many children; a sign of unregistered people due to the one-child policy introduced in an attempt to maintain sustainable population levels in China. The next small hutong has already been torn down to allow the government to modernize. The sustainable farming carried out by these people, and the sifting and recycling of rubbish, another local task, are being closed down with the village. These people have already swelled their numbers by moving from the country areas to the edge of the city, due to drought and dust blowing in from the desert. The film hints at Charlie Chaplin's *Modern Times*, to scope this dilemma of a shifting landscape in the hazy dust of evening light.

These stories are research backgrounding my artworks to begin attempting to understand landscape as a touchstone for story, as an important element in the making up of an ecology, and in understanding the shifts in migration due to weather, and the imperialism of taking the land and treasure once remote or difficult to obtain.

My recent photographic exhibition *Clouds and Roses* exploits the similarity of story in locations around the world: perhaps like Tolkien in *The Lord of the Rings*, where he speaks often of the distant mountains. His characters explain throughout their journey across the landscape the make up and mapping of the world as always headed toward the distant mountains. This tenant of creating a story with common touchstones gives a familiarity to something that is also from somewhere else. [7]

My digital photographs *Weathered Edges*, include a combination of the Elgin Marbles, with the torn wallpapers of a long deserted traders' hut in the High Arctic. Both are objects that tell, hint and are formed by our romantic idea of landscape. The appropriated landscape in our mind is fuelled by the story, which I see as a weather story of a forced migration and a landscape under contest. The Elgin Marbles were stolen by an Englishman: he hacked them out of the wall, and paid a bribe to the occupying force in Greece to steal them across the border. He attempted to sell them almost everywhere he stopped, before they eventually came to reside in the British Museum. Every time I walk through the Museum, I hear a high pitched English voice explain that the Greeks just left them out in the weather and would not look after them like we do: they have become British because of this claim to protection from the weather.

The Traders' Huts images also tell tales of people in the wrong place: the attempt by the Hudson Bay Traders as an Imperialist merchant group to trade for furs and gold allowing them to set up settlements. Often these were outposts only visited by the lost in search of fortune. When I visited the hut, which is heritage and UNESCO protected, I had armed shooters in readiness against the polar bears as I quickly took images in the very limited time available.

I have also long visited Lake Mungo in remote Australia. The local indigenous people have allowed me access to the site and story in a very generous and sharing way. They have taken me, or drawn maps for me to follow across the dried lakebed, to various places of significance. The series of lakes dried out some twenty thousand years ago, leaving behind the memories of muddy footprints that tell the stories of dancers, hunters and tribal meetings. The footprints are documented and hidden again as memory of the lost.

The site is of the oldest known ritually cremated human remains, dating some sixty-five thousand years. They are known as Mungo Woman and Mungo Man. These have been documented and re-buried away from prying eyes by the local groups. The site has a long-term history from early, and clearly very fruitful, nomadic peoples as a major meeting place. Then as a rest and watering point for trade and coaches moving across the shifting desert and lonely plains.

They ran cattle there until the 1970s when the local graziers handed the land back into the care of the traditional owners. Much of the local aboriginal population had died off from contact with white civilization, mainly from syphilis and influenza viruses. The site also had Chinese immigrant stockmen, who built the shearing shed.

The local Chinese workers would look across the dried lakebed to lunette being revealed by the continuous weather shift as the long-term drought progressed. They called the lunette the Walls of China in fond memory of the Great Wall. In the evening's shimmering light it does indeed remind one of the Great Wall and all that it stood for in a vain attempt to keep the people and stories of the nomads of the deserts out.

The multi-channel video installation that I had intended to show here *sand:bone:clay* invites us into this world of change. Of looking and walking in a landscape that references all landscape through story, through a sense of specialness, a wilderness, a thin layer of earth that reveals the broken bones from burials, the remains in middens, the clay balls for heat and what once would have been really good fishing places.

The Walls of China forms a semicircle shape protecting the lakebed from the giant moving sand dune behind. The dry lakebed serves to channel the drought breezes that carry nothing but sand and dry heat that slowly strip back the layers in the soft brittle remains of the lunette and reveal the histories.

The tribal groups have died or been forced from the land and they cling to these stories; allowing archaeological and anthropological intrusion in an attempt to regain their lost past.

The imaginary landscape of our mind is as real as the landscape presented within the images as they rely on storytelling, on the comprehension of a greater narrative being told. The work soundtracks the fear and the loss of the people and land to the intrusions of occupation, and later to archaeology.

My video work *Katiana: Night Snow* is a lament for a dying way of life and a people in the High Arctic. The imagery was developed while I was doing an artist's residency on a Russian Icebreaker. This group of people told their stories in song, drumming and the ancient keen of throat singing. They gathered along the beachfront, placed themselves at the meeting point, which is in the sun and out of the chill wind on one side of the washed up freighter-shipping container.

They sang the songs of their past, stories of bravery and hunting; of recognizing the guardian with animals and ice and their sacrifice and oneness within their ecology. The stories are also of the Government resettlement into small communities to assist in keeping the north peopled, yet able to be supplied with food, shelter, education and medicine. All the things that remote communities cut off by the weather require.

The Inuit wore a mix of traditional and modern clothing, taking up the singing and dancing across generations. Their small community has been ravaged by change. The mining companies send in workers and equipment for the gas seams that are now accessible due to the climate warming. Drugs and alcohol come with these men and the best attempts cannot stop this. Furthermore, the warming seasons now mean that polar bears come into town more frequently seeking an easy meal. People are such slow moving defenseless creatures under certain circumstances.

The series of artworks that I made from this experience and continued Internet contact with the Inuit artists I worked with there is a lament to the dying culture and the shifting weather and the change it brings.

The *Truth About SnowDomes* is an installation work that explores the sense of loss, and details a place. It tells the story of being there. The story of the location, of the landscape as something connected. Not something that deconstruction would put a line around and segment away.

Furthermore, my current work looking at the *Crisis Narrative of Landscape* also reaches to the stars, to the stories of the intention to build other worlds not just in Vast Park and Second Life but on other planets. My current project also explores touch with landscape and the interaction we have with the skin of the planet. I have begun collaborating with Professor Dias in Tianjin University to work with a new form of robotic hand designed essentially to clean solar panels on satellites.

These are the beginnings of stories that will tell of a different relationship to landscape. Perhaps Tolkien's distant mountains of the Middle Earth are replaced with the distant mountains of the Moon, told in our new stories of the planet and will speak the science of geology over biology.

My questions and attempts to bring together the various elements to suggest the narratives of landscape strives not to simplify or concentrate on the romantic vista, or the nomadic periphery but to combine our research within the flux of our current weather crises. This exploration will source the new narratives as enclaves within science, film, architecture and sociology. The layers of memory adopted within the imagery touches on shared belief systems, spatial planning and geopolitical reconstructions.

The meeting place of the Earth's surface is cradled within these images and the often-intimate exploration of the story. The basic concern is that within past and present actions can be found a future that revels within the sense of belonging. The future could be based within a continuing paradigm or shift

into greater understandings of technologies, new and ancient technologies to outline our potential for creating and investing in a future and visible world.

The projected images and context expand the basis that within the narrative of place, however that can be tapped into, could lay an understanding of the future landscape. This element begins to question and push the science of weather, land and the movement of peoples as a fission wherein may lie a new approach. Thus, using art within this space could create through spectatorship a more contemplative approach to the narrative of landscape and the crisis unfolding before us.

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EEG DATA IN INTERACTIVE ART

Claudia Robles Angel

The paper reflects upon the interaction of music and/or digital media with brainwaves' data obtained from performers or an audience via an EEG interface and to contextualise them as a dynamical system, as defined by Abraham and Shaw. A brief historical overview is introduced, with examples from the past 45 years –included one of my own– based on biofeedback methods developed from the late 1960s onwards.

In 1875, Richard Caton discovered the electric currents of the brain using a galvanometer by experimenting with animal brains, setting the path for the development of the EEG by the German psychiatric Hans Berger in the early 1920s. Berger was the first to record electrical impulses from human brains in 1924 (he called these recordings Elektroenkephalograms); he was also the first to observe the alpha wave activity (8 to 12 Hz), which is accentuated during relaxation. In the 1960s, Neal E. Miller applied such experiments for therapeutic treatments, which resulted in the creation of the Bio-feedback method. This method has been used since then to measure the physiological activity –such as brainwaves, heartbeat or muscle tension– of patients in order for them to learn how to control those activities and improve their health condition by increasing their body and mind awareness. Schwartz and Andrasik state [3] that in 1969, Joe Kamiya, who was studying the alpha and beta brain states, reported that:

“one could voluntarily control alpha waves –a feat that was previously believed impossible.”

With his research, Kamiya gave a vital impulse to the usage of the EEG-Biofeedback-method, most commonly known as Neurofeedback. Before that (mid of the 1960s), the use of EEG was incorporated in art by composers such as Alvin Lucier and Richard Teitelbaum with their first performances utilising brainwaves, and hence, giving for the first time a new usage to EEG data other than scientific or therapeutic. The artworks described in the next section show how the use of EEG data in real-time pieces results in dynamical interactive works: their evolution is in constant modification, changing accordingly with emotional and/or mental states by each performance. This variability implies a dynamical system, as Rosenboom [2] explains :

“Dynamical systems may be thought of as those involving forms or behaviors that change over time. The study of such changing forms may also be termed morphodynamics.”

EARLY EXAMPLES

In 1965, Lucier composed *Music for Solo Performer - for Enormously Amplified Brain Waves and Percussion*, which is considered the first musical piece using brainwaves. For this piece, he attached electrodes

to the performer's scalp, measuring only the Alpha rhythm waves, which were sent to amplifiers and loudspeakers connected to a large set of percussion instruments, in order to produce vibrations in these instruments via sympathetic resonance.

Some other important examples are Teitelbaum's [4] pieces: *Organ Music* and *IN TUNE*, both created in 1968. In both of them the composer used the EEG signals mainly to control voltages in the Moog synthesizer, including in some cases not only the alpha waves range but

"comprised the broad spectrum from DC to about 50 cycles per second (Hz). It was applied chiefly to frequency modulate four voltage controlled oscillators, and also to control the amplitude and filtering of these audio signals."

For *On being invisible* (1976/77) David Rosenboom [2] developed his own real-time software to create "a self-organizing, dynamical system, rather than a fixed musical composition."

His dynamical, real-time system extracted patterns from the performer's brain activity that appeared with at certain regularity and compared them with some others stored before. This comparison determined their periodicity in order to influence different music parameters. The software detected and analysed the event-related potential (ERP) from the brain activity –which is associated with the direct response to an internal or external stimulus– in order to activate instruments, creating a circuit between the performer and the sound environment produced by the system.

The EEG has also inspired several artists using different types of media. For example, in *On being invisible II* (1994/95) Rosenboom includes lights, video and slide projectors. In Mariko Mori's *Wave UFO* (1999–2002), brainwaves from three participants inside a sculptural object –a spaceship– are connected to the audiovisual elements in order to create an interactive experience that invites them to be immersed into a deeper state of consciousness and to interconnect with themselves and the universe, representing the Buddhist concept of oneness.

All these examples show rather different approaches to use this technology for artistic purposes since the 1960s. Interfacing EEG data with multimedia continues to raise the interest of artists aided nowadays by several devices/software such as, for example, the open EEG and the Arduino projects, as my piece *INsideOUT* –explained below– shows.

INsideOUT (2009) – Performance (EEG and real-time media)

The name of this project is inspired by the expression of the self, turning the subject's imagination from the inside to the outside, keeping the original intention of the EEG project by materialising the performer's thoughts and feelings on stage. The stage is a place for the appearance of the invisible. Michael Haerdter and Sumie Kawai [1] quote that Yasu Ohashi stated that:

"the actors aim at our senses, our body and our unconscious and not at our intellect. Their gestures try to envision THE INVISIBLE WORLD."

INsideOUT was created during an artist in residence program at KHM (Germany). The performer interacts with sound and images using an EEG interface, which measures the performer's brain activity.

Sounds and images –some already stored in the computer and some produced live– are continuously modified by the values from two electrode combinations via MAX/MSP-Jitter. Hence, the performer determines how those combinations will be revealed to the audience. Images are projected to a screen and also onto the performer, while sounds are projected in surround.

The *Olimex* EEG open source interface (<http://www.olimex.com/>) used here which measures the brain activity and consists of two assembled boards: one analogue and the other digital. It is possible to connect up to three boards, each with two EEG channels. Only two are used for the piece though: frontal and occipital. The rubber cap and the contact electrodes of the interface are those typically used in medical applications.

I received technical support from Lasse Scherffig and Martin Nawrath at Lab3-KHM to adapt the interface. They modified the open EEG device by replacing the Atmel microcontroller with one running the Arduino firmware and changing the quartz clock accordingly to 16 MHz.

Scherffig wrote a program with the software *Processing*, which reads the values of both EEG channels via a serial communication. The modified open EEG sends ASCII-formatted data representing the voltages of both channels (at a frequency of 100 Hz). In *Processing*, a Fast Fourier Transform is applied to the data and extracts the bins for the frequencies between 0-50 Hz. From these, the median of the frequencies for the alpha channel (8-12 Hz) is extracted, smoothed using a low-pass filter and transmitted via OSC, which is received once again by the OSC-route object in *MAX*.

For the performance of *INSIDEOUT*, I have tried to train my brain in order to control the media combinations on the stage, putting in evidence different emotional and mental states, which cannot be achieved without the input of data coming from my own brain waves. However, this conscious control is not completely attained due to the enormous and uncontrollable stream of feelings that generally appear under such circumstances.

CONCLUSION

Based on my own experience of performing pieces using EEG data, the common ground is the presence of a behaviour, to produce a dynamic system, as explained at the start of this paper. Whether the mapping of data interfacing with the media is made directly or occurs via more complex systems (e.g. Rosenboom's software) the structure of the pieces is invariably not fixed; instead, it evolves dynamically. This dynamic evolution depends on the performer's or participant's emotional and/or mental state, which is affected by the perception of their own self and by the perception of the piece's environment. The result therefore varies strongly between performances of the same piece, making them impossible to replicate.

The aim of my research in this field is mainly focused on raising awareness of the artistic possibilities of consciously controlling brain activity on stage to steer multimedia events and, at the same time, to allow feelings –the real creators of each dynamical system– to flow freely.

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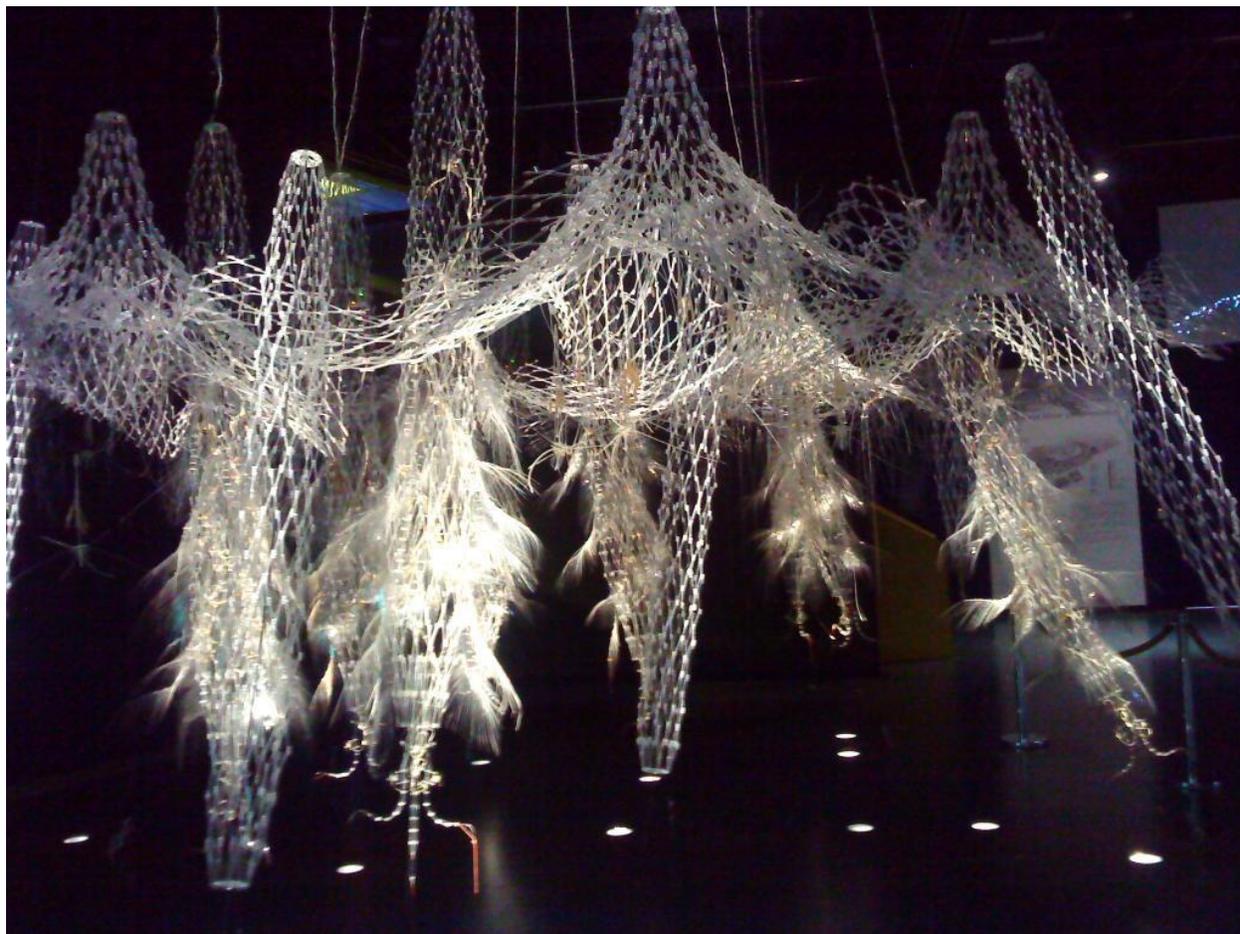
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A CYBERSEMIOTIC APPROACH TO TECHNOETIC ARTS - NEW VOCABULARIES IN TRANSDISCIPLINARY RESEARCH

KATHRINE ANKER

In this paper I will introduce central terms from the Cybersemiotic paradigm (Søren Brier, 2008), and show how they can successfully be applied to interpretational readings of technoetic artworks. I wish to extend the idea that user experience in technoetic artworks is mainly immersive and non-intellectual, and to present new hermeneutical positions that explicitly take ontological and paradigmatic perspectives into account.



Hylozoic Grove. Ars Electronica Museum, 2008. © Kathrine Anker

Consciousness as "Extended Sentience"

Before moving into the actual subject, I need to define "human consciousness" as it is presented in this article. Human consciousness is understood not only as "the self-", as awareness, as something psychological, or as an emergent property of the brain. I understand the full range of dynamic, interactive processes that allow the organism to be sentient across a range of endo- and exo communications as

overall expressions of how consciousness manifests in humans. Consciousness in humans is viewed as a sign of an external natural force to which the organism has become increasingly adapted throughout evolution.

One way consciousness expresses itself is through the potential of the body structure to generate synthesis between dynamic processes that involve sensation, brain and heart based neuron activity, the autopoiesis of overall organisational systems (such as the nervous system or the reticular system), general molecular and cellular transactions (biosemiosis), and extremely low frequency electromagnetic excitation at the level of superposed quantum connectivity. [1] The connection between all these levels of communication, and the responsiveness that it results in, is what I call Extended Sentience (ES). As viewed from this perspective, it becomes vital to model a complexity of hierarchically divided and qualitatively different processes of communication, if one wants to understand more of how consciousness works within us. To do so is a semiotic and semantic task. This task demands new vocabularies, and a strife towards new levels of meaning in presented narratives.

Technoetic Arts

Technoetics is a term originated by artist and professor Roy Ascott. Technoetic art is art that experiments with the relationship between technology and consciousness, and raises questions of how new technologies affect human consciousness. [2]

It is my view that technoetic art installations address a broader range of processes involved in ES than many kinds of cultural communication to which we have been accustomed before digital media (such as pictures and print literature, which are static and fixed forms that do not inhere functions of physical mobility or behaviour as part of their material foundation) have done. Therefore, forming narrative-hermeneutical interpretations of the experience of technoetic art installations through a constructed "Ideal User" could provoke common assumptions into new thinking. This is because narratives that articulate the way such installations must connect existing technological and scientific paradigms in an open exploration of spiritual insight, expressed in a multisemiotic and multimodal signification, typically force the interpreter towards the "yet unformulated" (which, however, lie as symbolic sign potentials in the installation). This endeavour demands new semantic syntax at the level of general, socio-cultural language games. It forces the meaningful linguistic, narrative to transgress the fragmentation of thought that I experience as widely embedded in disciplinary practices and common socio-cultural language games of today. To accomplish possible formulations of such transgressive narratives, I must operate with several observational positions: that of an Ideal User, and a position outside of the Ideal User.

The Ideal User is a semiotic being

A central idea of cybersemiotics with which I agree, is that humans are by nature semiotic beings. Signification processes and meaning making are characteristic of our presence and navigation in the world. We understand through the processes by which we interpret signs in our surroundings, whether they are the cultural signs of print, image and object, or signs in nature. Therefore, I would claim, the ideal User would always already have a semiotic relationship with the art installation.

As humans we generate signification spheres on behalf of internal and external semiotic processes, which develop into complex socio-cultural language games over evolutionary time. [3]

“Language”, in this context, must be understood to include all sign systems that are developed and mediated in all cultural mediation forms. The art installation would be directly related to current socio-cultural “language” and “text forms”. It is my claim that Technoetic Arts relate particularly well to central themes and communication forms significant of our current (Western) signification spheres.

But naturally there is more than cultural languages involved in semiosis. This is Brier's point when he suggests the term “phenosemiosis” as a central part of his framework. It is only as the immediate, non-linguistic experience (which Brier names “phenosemiosis”) is interpreted in thought processes (which Brier names “thought semiosis”) and is represented by signs and concepts from intersubjective socio-cultural language games (Brier's synthesis of Luhmann and Wittgenstein), that cultural semiotics based on triad semiosis is formed. This involves both collective and individual levels.

Thus, there would be a range of semiotic processes of which we are individually or collectively unaware. They belong to the realms of endo- and phenosemiosis. They do rely on the operations of consciousness within us. But they are governed by rules outside of our day conscious awareness. So to equal human consciousness with a “rational intellectual Self” as the “master”, would be to focus on only the “tip of the iceberg”. For greater clarity, I call rational conscious awareness “day consciousness;” and regard it as a partial subset to overall Extended Sentience. Becoming aware of internal self-generative communications (processes of “intrasemiosis” according to Brier's terminology) of which we have typically been unaware, would imply to signify and identify inner “states” by the use of focussed thought semiosis. I will place the claim that there is a potential for expanding our (self) knowledge from this very position. This demands an inwards perspective.

The four semiotic terms, “phenosemiosis-”, “thought semiosis-”, “endosemiosis-” (internal molecular and cellular signification processes) and “intrasemiosis-”, plus “signification sphere”, and the concept of “socio-cultural language games”, are all part of Brier's framework; they are the new conceptual terms that he suggests.

Hylozoic Ground

Hylozoic Ground is a kinetic sculpture by Canadian architect Phillip Beesley and a collaborative group. It has been developed as a work-in-progress (2007-2010) with increasing complexity in sculptural components as the work progresses. *Hylozoic Ground* is based on the creative use of lightweight fabric, and the construction of a geometrically patterned “mesh” and skeleton enhanced with micro controller-, actuator and sensor technologies that allow the sculpture to present a range of different responsive behaviours. The first versions of the sculpture were based on “dry”, mechanical technologies, whereas later versions involve synthetic biology in the form of artificial cells, placed within the fabric of the sculpture. The different synthetic cells are sensitive to carbon and humidity in their surroundings. *Hylozoic Ground* is centrally inspired by properties of living organisms. To play with the generation of features that are thought to bring matter into “life” involves deep, ontological questions of what life is per se. [4]

Hylozoic Ground can be seen as an experimental research process that questions the overall relationship between laws of physics, geometry, biology and cybernetic mechanisms, all necessary elements in understanding the central characteristics of life. To form a material entity that distributes scientific and philosophical ideas of sentience, proprioception, metabolism, homeostasis, and communication in a concrete, functional sense allows a forward directed, creative approach to knowledge. The generation and distribution of art research alters the experience of knowledge, because the artist is, rather than

seeking exact answers in a reductive manner, making creative suggestions and posing new questions. Electronic and computational technologies, together with the development of new fabrics and various kinds of adaptive chemistries, allow for a degree of complex aesthetic ambiguity for the interpretational seeker of symbols and meaning. Rather than looking for fixed signs, whole mechanisms and processes would be representative of functions in the living organism, which are in *Hylozoic Ground* imitated and related to each other creatively, in a material, aesthetic and dynamic whole.

So, when contemplating *Hylozoic Ground* hermeneutically it is not enough to form narratives based on the language and concepts of science. As Rachel Armstrong points out (Beesley, 2010, p.136), there are aesthetic and poetic layers that cannot be articulated within the semantics of a scientific vocabulary. Thus, the narrative endeavour of our Ideal User would have to be based on transdisciplinarity, and to be unrestricted by current, institutional divisions.

Hemeneutical Positioning through the Ideal User

To understand the position of my Ideal User further, it is necessary to become acquainted with the way I use Brier's concept "signification sphere."

The Ideal User would, further than being semiotic, exemplify the way scientific and philosophical epistemologies have infiltrated the general signification sphere of the user – which is equal to modern, Western (knowledge) societies at large. So the Ideal User has integrated particular scientific positions of both the human and the natural sciences as a prerequisite for her interpretations by her natural use of existing, socio-cultural information sources and sharing, as she takes part in general socio-cultural language games. Certain common scientific assumptions would, seemingly, be part of the "Ideal User's" cultural memory and immediate prejudice. They have become internalized through the socio-cultural language games of her signification sphere (education and media). This might seem simple. But it is my claim that behind the diversification of many individual opinions, there are basic ontologies and general assumptions that dominate a given signification sphere (as in Foucault's "epistemes"). And mainstream science plays a solid role in this. We must remember that many basic assumptions, which dominate the language games to which we are accustomed, are automatized so that we do not notice them, even if we make interpretations that are centrally based upon them. Thus, it is my claim that the signification sphere of the user inheres common assumptions of the nervous system, sensation, skin, breath and a particular way of understanding living processes and consciousness, which are all expressed in *Hylozoic Ground*. However, the creative blend and experiment of the installation presents a natural opening towards combinations of common assumptions and existing knowledge that in themselves transgress existing cultural and semantic borders. The attempt to articulate hermeneutic positions of an Ideal User, thus, is forward directed and creative. And it will demand the formation of concepts of the human subject that transgress existing, common assumptions.

Artificial texts and biotexts: Is *Hylozoic Ground* alive?

In humans, the levels of socio-communicative language games and thought semiosis demand the ability to generate meaning as part of the internal processes of the organism in relation to being part of a specific, eco-cultural niche. Now, an conceptual integration of simultaneous processes relating linguistic, cybernetic, autopoietic, sensorial and motor properties is generally difficult to simulate or materialize in

Robots, Artificial Life and Artificial Intelligence scenarios – no matter how advanced research and engineering practices might have become. In our example, *Hylozoic Ground* cannot be understood to generate its own internal semiotic relations that are meaningful to itself, neither at the level of socio-cultural language games nor at biosemiotic levels. The many distributed micro controllers, along with circuits and the central Arduino board, do allow for local and global information processing in the sculpture. But *Hylozoic Ground* cannot be understood to have properties of true self-maintenance, self-organization or semiosis, even if both the chemical and electronic parts are capable of generating some degree of emergent behaviour and sensibility to external input. And if we extend usual ways of understanding memory with James Oschman, who suggests that stored information can be layered in wet organs and tissues all over the body, [1] it becomes even more obvious that there is a complexity of micro and macro levels of communication that are characteristic of conscious, living beings like ourselves, and the understanding of which becomes severely reduced when using metaphors related to mechanical processes based on signal exchange or pattern fitting (Brier) alone.

So the sculpture has no internal interpretational processes that rest upon triad semiosis (object-representamen-interpretant). It cannot connect all parts into an overall, fine tuned, self-generative communication system that integrates information, mechanics and triad semiosis simultaneously. And this integration is the core of the cybersemiotic model, and Brier's demand for an organism to be conscious and alive.

The mechanisms necessary to generate movement and sentient reaction in the sculpture, however, do demand a system of distributed information and intelligent computation. Otherwise input could not be translated into output, and reaction to users could not occur. This invites us to contemplate the installation from different points of view. We could consider the necessity of computational distributed intelligence and creative human intelligence as central parts of the construction process - but simultaneously, we sense the simplicity of the functions of the sculpture as it is compared to wet, organic living entities as ourselves.

Generally, mainstream academia, particularly the field of biology, presents the idea that molecular, cellular and autopoietic processes of the living organism cannot inhere goal directed properties. This places a dissonance between our understandings of how nature works, and processes where humans play with constructing life like scenarios. We can curiously ask: if organic life came about through random non-semiotic mechanisms of competition and selection without goal direction or intelligence, how is it that we expect our own goal direction, intelligence to be the source of artificial intelligence, synthetic life and the creation of new “life forms”.

User interpretation as Internal Semiosis

Hylozoic Ground cannot generate meaning internal to the system and base its further processes upon it. But in our interaction with it as users, these processes do take place within ourselves. If we are taken by the installation and choose to contemplate the different layers of our immediate experience, we can ask ourselves how the phenosemiotic and biosemiotic processes would become linguistically signified and turn into intellectualized experience within our own day conscious minds – as opposed to what happens in the non-semiotic sculpture.

In the Oschman perspective, the experience of being moved and activated in the installation space would be presented as inner excitation and information distribution and storage within our wet organs.

The living sentience of our body and brain in immediate perception automatically generates inner quantum excitations, [1] [5] qualia, and images, thoughts and memories as one kind of signification that has laws, regulations and pathways independent of our intellect.

Simultaneously, there is a potential to intellectually grasp significations related to some of these processes through thought semiosis. My goal here is to have the reader sense the dynamics of the relationship between pheno-, thought and biosemiosis. It is to demonstrate that processes related strictly to the day conscious intellect can never stand alone in interpreting sensation and cognitive mechanisms. They are rather one part of ES along with other equally important parts. And it seems important in processes of (self)observation to add an inwardly directed focus of attention to the external focus that dominates recent scientific and philosophical practices. Brier's distinction between different cybernetic and semiotic processes can help us articulate and understand this potential.

Conclusion

The process of exploring technoetic installations with a focus on their particular creative blends of paradigms into new knowledge compositions, together with the cybersemiotic terms, allows me to formulate transgressive narratives regarding the human subject. As Armstrong expresses, a sculpture like *Hylozoic Ground* cannot be understood by referring to scientific narratives alone.

Hermeneutical narratives related to technoetic arts must incorporate the ambiguity of aesthetic components and seek to reach definitions of Extended Sentience in ways that would be useful to the general development of human knowledge. Classical, philosophical definitions of aesthetics have typically focussed on qualia and sentience. Yet a sculpture like *Hylozoic Ground* demands a narrative that integrates intellectual approaches with aesthetic synthesis, presenting stories at higher-order levels of observation. Trying to locate an Ideal User at this level, forces us to discover a higher-order, narratively structured intellect that cannot be equalled to usual understandings of “a Self” or an “ego”.

It is my claim that the cybersemiotic paradigm can aid in fulfilling this wish, and bring otherwise abstract observations down to earth in a comprehensible, linguistic signification. It is my further claim that narratives that present a hermeneutical, pre-paradigmatic, and transdisciplinary perspective on technoetic arts, can add useful dimensions to the new experiences that art installations already offer in Western societies today.

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PHI TERRITORIES: NEIGHBOURHOODS OF COLLABORATION AND PARTICIPATION

Alexandra Antonopoulou & Eleanor Dare

The 'Phi Books' Project is a collaborative endeavour between Alexandra Antonopoulou, a designer and children's book writer-illustrator and Eleanor Dare, a fine artist who works with code. The Phi Books use the house as a metaphor for interdisciplinary collaboration. The two researcher-artists use narrative, audience participation, code-writing, and performance to explore how borders, walls and doors facilitate collaboration.

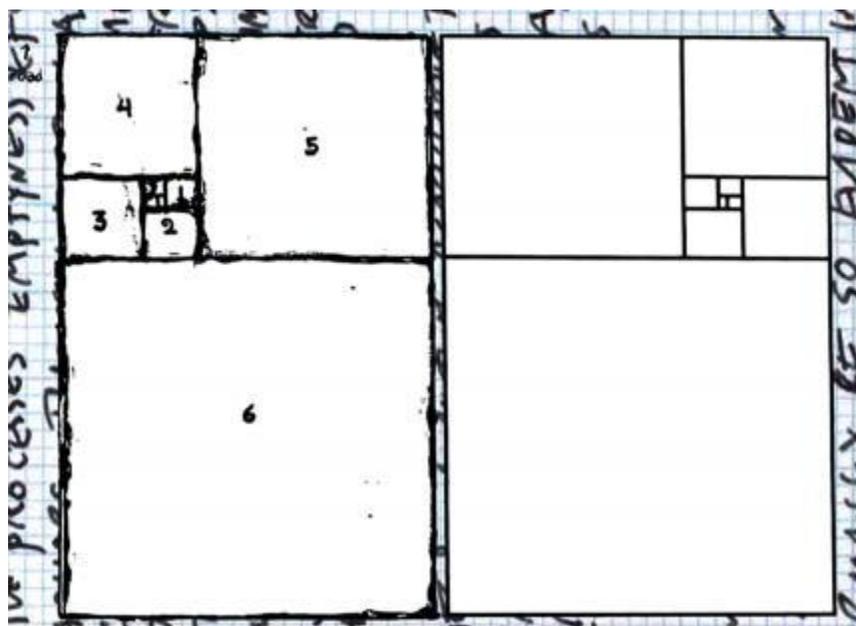


Fig 1. Poster for Phi Books, mixed media. © Antonopoulou & Dare, 2009

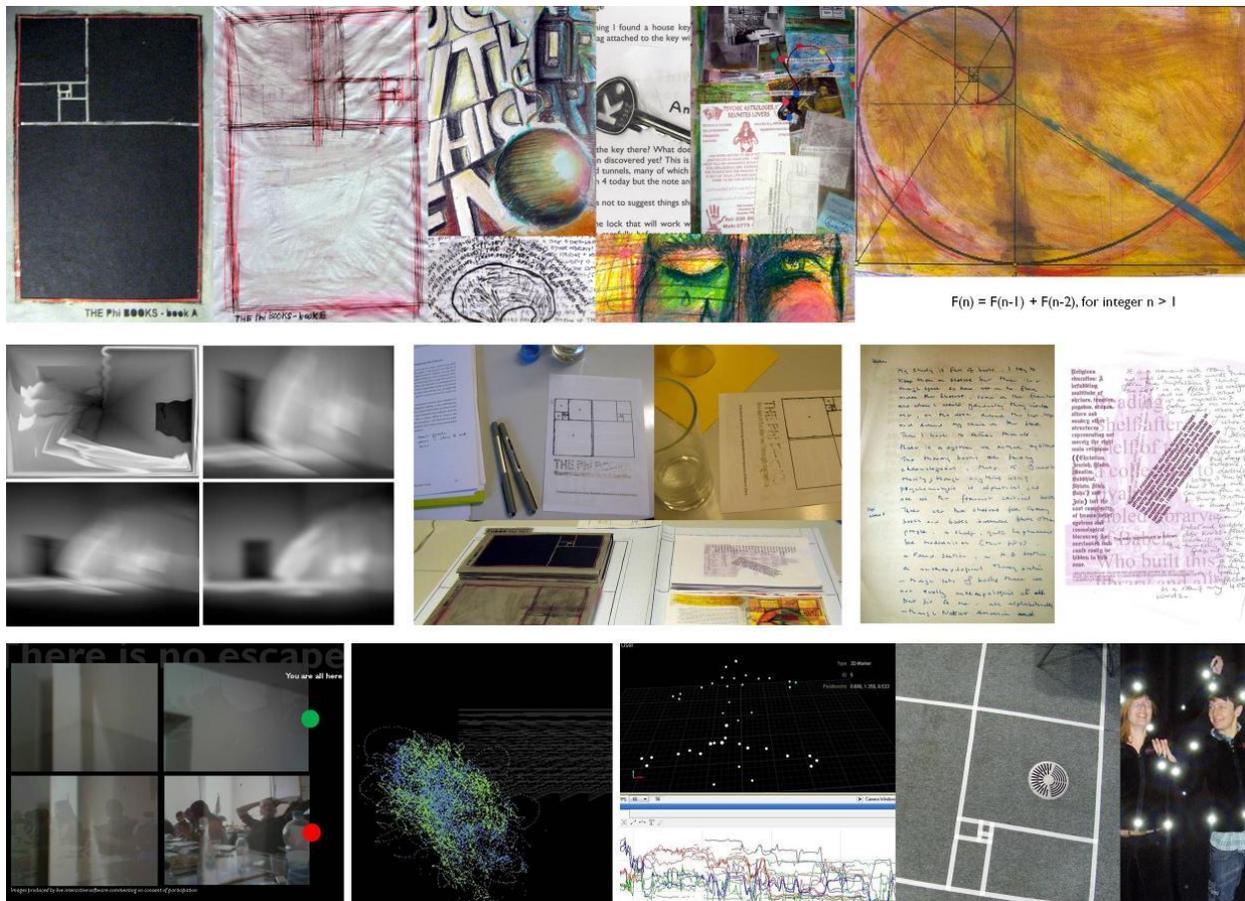


Fig 2. Top: Phi Books, Antonopoulou & Dare, 2008. Middle: Images representing the Phi room's sounds - Phi books installation- Participants' stories, Antonopoulou & Dare, 2009. Bottom: Phi Film, interactive application playing with consent, processing application. Antonopoulou & Dare, 2010. Participants body performance visualization with motion capture system -Phi stage from the 'Thursday Club' performance- Motion capture suit, Antonopoulou & Dare, 2011.

E. The Phi books is a collaborative project between Alexandra Antonopoulou, a designer and children's book writer-illustrator .

A. and Eleanor Dare, a fine artist who works in code.

E. The Phi books use the house as a metaphor for interdisciplinary collaboration. This will be outlined and clarified in an article that is somewhat unorthodox in form, reflecting how our collaboration has become more and more performative. The article is therefore produced here in script-form, where we, as agent-actors (A= Alexandra E= Eleanor) take it in turn to read out and perform our themes and findings.

A. The project evolved in different stages from the initial formulation of written algorithmic fictions to technologically mediated and embodied systems for collaboration. It uses stories, theory, drawings, maps, charts, found objects, photographs, dreams, spies, keys, overheard conversations and meta-critical observations.

E. The Phi 'neighbourhood' or 'territories', representing our expanded practice, has extended into wider collaborative practices in which 'house stories' have been written by participants at our lectures and performances while using reiteration of mediums.

A. We were lead into more performative and interactive forms using real-time interactive programs. For example the 'Phi Film', software that played with people's consent and participation and the use of motion capture technology where we asked people to physically perform their house stories as actors and active agents exploring collaboration.

But let us tell you bits of our story.

E. Our first presentation together was in 2008 when we both presented our individual projects at a regular interdisciplinary event called the 'Thursday Club' at Goldsmiths. During the discussion we found ourselves interweaving the passage of our research projects as if they formed one bisected, inter-dependent narrative.

A. Back then I wrote: Stories were like a secret code, a silent and camouflaged set of communication rules. We needed the stories to continue to communicate with each other, we needed to have a project as a mask to fulfill our thirst for telling stories. But wait a second that means collaboration! We were both odd and we did not even want to admit that we were already collaborating, we were scared of the spies, we were scared of losing our freedom, terrified that we will end up in uncomfortable situations. [1]

E. Our research fields seemed similar and yet they are different in many important ways. The common ground we share is fiction.

A. My research focuses on the educational-social-participative-heuristic role of story-making in designing. It involves partnerships with designers and children, facilitating them to author their own material and learn through play fiction and design, while using story-making as a design concept stimulus. I also create digital and physical tools for interactive story-making and I am interested in the use of story-making as a research methodology.

E. My practice centres upon the meaningful capabilities computation has to offer the arts. Throughout the last five years I have refined my practice into one that interrogates both the collision and synergy of digital and analogue art forms. My PhD research was primarily concerned with programming situated and responsive book forms that react dynamically to contextual and subjective moments in time.

A. We used English terraced houses as a metaphor for our research. Those houses have the same architecture and seem identical, but they are different since different people inhabit them.

E. We bought two identical books which were the metaphor for our houses. We wrote stories for each room in the houses and then we swapped the books to write a response to each other's stories. This seemed to mirror an 'extreme programming' methodology in its agility and rapidity and in our attempts to 'break' each other's stories.

A. We used a mathematical algorithm to write a precise number of words for each room. The numbers of the words in each room were following the logic of the phi ratios, this was the foundational structure

for our collaboration. Room one is 100 words. Room 2 is a room of 200 words, Room 3 is a room of 300 words. Room 4 is a room of 500 words. Room 5 is a room of 800 words. Room 6 is a room of 1300 words. [2]

E. To explain our writing algorithm: Ignoring the seed values, each remaining number is the sum of the previous two or $F(n) = F(n-1) + F(n-2)$, for integer $n > 1$.

A. Room number 1 story: Room one is a tiny room just 100 words. What could it fit in a tiny space of 10x10 words? 'The little prince was pale with anger, for millions of years flowers have been growing thorns and for millions of years sheep have still been eating flowers, and is it not worth trying to understand why they do go to such lengths to grow thorns which are of no use to them?' (*The Little Prince*, Antoine de Saint- Exupéry). We are all sheep flowers, we eat and being eaten. [2] I used the idea of sheep flower as a metaphor for the collaboration process. We all have thorns to protect ourselves, but it is inevitable to be inspired by others and give inspiration to them as well. In our turn we are sheep taking from others even though they have thorns themselves

E. The stories are followed by note pages that reflect upon our thinking and link our stories with theoretically referenced texts.

A. By the time we reached room six, I had already instigated a full scale rebellion against the phi ratios, bursting out of their numerical constraints and inviting readers to do the same by writing their own stories. Eleanor joined in the rebellion by reverting to code, which is, of course, a type of language. At the same time she wrote in my territory, tunnelling into one of my rooms, and leaving words as provocations. She used stardust in her illustrations and these specks of shiny little dots were transferred into the whole book. That was the collaborative contamination. We used tight structures in order to define our individual territories which were eventually merged, giving birth to a wall-free collaboration.

E. In public we performed the Phi books, blurring the distinction between academic presentation and storytelling by playing the part of our fictional characters, drawing the audience into our ambiguous narratives of research and story-telling.

A. We wanted to maintain the logic of the Phi ratios in our performance as we did in our writing. We aimed to connect the linguistic to the sonic and to the spatial constraints of our collaboration.

E. We used sound to maintain the logic of the Phi ratios and to punctuate the performance. Each sound progressively expanded to reflect the increase in size of each room in the Phi house, according to the ancient Phi ratios. In the books each story's word count corresponded to the ratios of the room it was based in. We modelled the room sizes computationally to get a reverberation that was fitted to the geometry of each room.

A. In Berlin we said: This performance is based on our interpretations of the project, characterising their joint work as a paradigm for joining individual practices, leading to a result that celebrates both collaboration and individuality. We are going to take our audiences inside our Phi houses, where they can interact with the installation of our Phi neighbourhood, looking at our houses and creating their own research houses in this neighbourhood. [1]

E. A participant wrote this: My study is full of books. I try to keep them on shelves but there isn't enough space so some are on the floor under the shelves, some on the furniture, and when I write gradually they circle me, on the desk round the lap-top and round my chair on the floor. Then I have to return them all - there is a system or rather systems.

A. We chose to put this contribution into this article, but we couldn't put them all in. How are we supposed to choose? We put them in a bucket shook them up and pulled one out. We didn't like the first one so we did it again.

E. In London at the Inter-Art Symposium (2010) we devised an interactive application to comment on consent and participation, combining the physical space of writing performance with virtual space.

A. While the application was running we said: 'Please attach a sticker to yourself. Please adhere a green sticker to signal your consent to participate, and a red sticker for dissent, meaning that you do not wish to participate in this performance. Place the sticker in a position that is clearly visible yet tasteful. Are they all in place? Then we can begin (...).Did you hear a smooth, metallic mechanism over by the door? A series of automatic locks have been activated. You are now confined in this room. Your detention gives you all ample opportunity to enjoy the fruits of participatory performance.' [3]

E. The Phi Meta Film was an interactive computer program written in Processing. It enabled us to project our own film of the Phi Books while grabbing colour values from live CCTV images of the River Thames, filtering those into the film and then gradually merging live images of the audience into that film and saving the new version. Here we have very quickly revealed our methodological foundations. Like many houses in London, the Phi houses have water flowing beneath them. The water that flows beneath our houses is an interface to the mutability our visible structures suppress. [3]

A. But is there really an 'interface' between us, a set of doors through which we will walk towards each other? Or is the concept of an interface a fallacy as Matthew Fuller has written? [4] Can there be such a thing? Right here, right now? If so, what form does it take? Is it an object or an event?

E. Our next destination was Stockholm

We stayed in a strange house in Stockholm. It had doors that lead to no where, multiple staircases. geometry was playing a large part everywhere, it all tied in somehow with the logic of the Phi Books.

A. We realized that we don't just make stories, our lives are the stories.

E. We gave a talk in the library at Stockholm University, surrounded by books, in a sort of book womb. Alexandra and I both have a past of working in libraries, we share this silent occupation with our favourite authors, Georges Perec and Jorge Luis Borges. We see libraries as neighbourhoods of storytelling, much like the terraced houses of the Phi Territories.

A. 'The only thing that remains is diving in the alleys of the books, sleepwalking guided by the books' numbers. I feel like a blind mouse guided by the book voices. I have to put them all in place otherwise I will be punished. Sometimes I put them in the wrong place on purpose to separate them from their friends and family. They are suddenly between other books with different interests; they hesitantly talk to them. When they return to their right shelves they have new stories to tell. Certain books fall all the

time in my head, they want to fill my mind with words, they scream, read me you fool...but I am just blind mouse.' [2]

E. In 2010 we asked participants to perform their own stories. With the help of Marco Gilles and Andrea Kleinsmith and the 12 camera motion capture system at Goldsmiths we began to record the gestures and body performances of ourselves and others in recounting narratives of the rooms where we work, rest and create. The cameras translate people's movements into lines or points detaching the self. In that case the participants become agents however their movement can still reveal who they are. We also aim to record the participant's house stories with video-cameras in order to compare their graphically represented movement with their psychical self-represented performances. This will enable us to extrapolate new layers of embodied narrative and subjective articulation.

A. In our latest presentation at the Thursday club in 2011 after we performed our stories, we asked our participants to perform their own stories in real time. Even though, the Phi books became spatial (physical-virtual) neighborhoods and territories, we still want to call our project the 'Phi Books' as we believe that a book can be spatial, performable and independent, detached from its ordinary form.

E. We value, rather than problematize the difficulties of communication and mutual understanding. We looped with our participants through dizzying cycles of research and re-evaluation. The project is also a response to the inadequacy of historical models for both theorising and practicing creative research collaboration, and to an apparent lack of theoretical mobility across diverse disciplines.

A. The Phi Books entail research-by-practice in keeping with the complex and multi-faceted meanings the notion of research-by-practice evokes, and as evidenced by theorists of research and practice such as Graeme Sullivan, [5] Paul Carter, [6] Barbara Bolt. [7] and Henk Slager. [8] Both our individual research activities and our collaborative work has contributed to our view that storytelling tools, whether analog or digital, must deploy the materiality of mediums, while also drawing upon the situatedness and subjectivity of human storytellers or story-makers.

Conclusion

E. As Stephen Wilson states, [9] we contribute to research by defining new questions, but also, at times, by 'using systematic investigative processes to develop new technological possibilities or to discover useful new knowledge or perspectives'. One of the consequences of this project has been the questions we have generated for our collective and individual research, such as:

A. How can artists/designers/researchers communicate openly with each other during collaborative processes?

E. How can people learn through performing and making stories?

A. What is a book? Is the book-form performable? 'I am the voice of the book you are writing on, your thoughts belong to me, you are part of the white pages, plain material, ink and paper. I am the carnival, I am what others see, I belong to everyone and you belong to me.' [2]

E. Can books be written by humans via methods and procedures more familiar to computer programmers?

A. How can making in conjunction with narrative lead to design innovation? How can story-making be used as a methodology for research projects?

E. We consider the Phi Books a system and a method that was embedded with the productive possibility of its own destruction. The possibility of destroying our own methods might be framed as an aspect of the Phi Book methodology, or ecological intersubjectivity, which, to quote Graeme Sullivan 'acknowledges that the self and others are reflective and reflexive beings. This suggests that meaning is not contained within a form itself, say a person, painting or a poem, but exists within a network of social relations and discourse.' [4]

A. The Phi Books project has illuminated naturalized, internalized notions of what Bill Gaver and Phoebe Sengers describe as 'single, specific, clear interpretations of what systems are for and 'how they should be used and experienced.' [10]

E. This recognition has enabled us to step away from the 'presumption that a specific, authoritative interpretation of the systems we build is necessary, possible or desirable.' [10]

A. This is a voice from the flat next door. I am not a human; I am just a utopia machine, a placebo for my neighbours. I am helping them to hear their thoughts; they justify them through my existence. I might be an artificial pulse for the person living on the right of my flat, something completely different for someone else. I only wish there was another machine elsewhere, to hear myself ... the machine. [2]

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GENERATIVE NARRATIVE IN COMPUTATIONAL ECOSYSTEMS

FILIFE ANTUNES & FREDERIC FOL LEYMARIE

This paper analyses modes of interpretation of that part of the generative art practice making use of computational ecosystems, i.e., virtual reality-based worlds mimicking or simulating an equivalent real-life ecosystem. We discuss the notion of generative narrative, as the model for this genre of works. This argument is illustrated with a case study, *Senhora da Graça*, which artistic concept is grounded on this model.

1 Introduction

By computational ecosystem (CE) we understand an artificial environment, produced in silico in the form of a virtual world, populated by an heterogeneous class of artificial life forms; such class, will in the more complex cases represent multiple trophic levels, forming a continuum in a food chain, with representatives from the plants, herbivores and carnivores. Simplest simulations however often have two distinct trophic levels represented, with one species of producers and another of consumers, such as is the case of Jefferey Ventrella's *Swimmers* or Jon McCormack's *Eden*.

As artistic artifacts CEs appear throughout the last thirty years in different curatorial projects, galleries, and art festivals. This artistic practice had its first major blooming season in the mid 1990s, when produced by pioneers such as Christa Sommerer or Jane Prophet established the roots of the practice with a series of works which are nowadays seen as early landmarks of evolutionary art.

Engaging in a discussion on CEs as artistic instruments, the aim of the present paper is to formalize the concept of generative narrative as the model these works operate. This model of narrative confers CEs the potential to address projects which are significantly distinct from those of their aesthetic cousins: other evolutionary art in the computational medium, such as the Scott Draves's *Electric Sheep*, or carbon-based ecosystems based art such as Ken Reynaldo's *Hydroponic herb garden*.

Throughout this document we will articulate a number of voices (Latour, Kjaerulff, Hayles, Eco and Holland) to lay out a theoretical framework which attempts to see behind CEs' formal novelty and invention, and understand the mechanisms at play in conveying context and artistic meaning.

Our previous work *Senhora da Graça*, where the apparent two realms (the formation of narrative and the physical ensemble) articulate the artistic concept, will be brought into the discussion as case study to assist in the deconstruction of the processes of narrative.

2 Computational ecosystems as works-in-movement

With an algorithmic and systemic understanding of the artistic artefacts, this practice takes expression in the construction of rich generative computer-based works which renew themselves, and evolve dynamically. Rooted in ALife, CEs operate within an aesthetics of complexity where emergence, self-organization and autopoiesis appear as a focus of interest in an agenda pursuing novelty and spontaneity.

The foundations for the mechanism driving this evolution lie, in the internal dynamics of the complex adaptative system formed by the populations which inhabits the worlds. Its structure follows a bottom-up logic common to ALife systems where the complexity of higher level structures emerges in recursive interactions from lower level building blocks and rules.

To discuss aspects of an aesthetics of emergence it is pertinent to recall Umberto Eco's concept of the open-work. Eco, suggests works of art to operate in a state of potentiality, of unexplored possibilities which they may admit. An open work is not limited to a single linear reading. Its open-ended nature is complex and offers an unlimited range of possible readings, works are 'open' to continuous generation of internal relations which the addressee must uncover and select in his act of perceiving the totality of incoming stimuli. [4]

Particularly critical for this discussion is the 'work in movement', a term Eco uses to describe pieces which operate as invitations "to make the work together with the author," works that "characteristically consist of unplanned or physically incomplete structural units." [4] In CEs, the building blocks of the system interact autonomously. Emergent processes create new trajectories. The work admits a large number of possibilities. However each run will only see one sequence of these potential outcomes. The complexity of the ecosystem generates such wide range of combinatorial possibilities that two different runs of the system will systematically diverge in outcomes. Amongst the illustrations of the 'work in movement' are Calder's generative mobiles. As in CEs the modular structures of the mobiles pre-exist the viewing experience. And in a somehow similar way the work articulates time in its substance. The 'Open work' was first published in Italian in 1962. Three decades later, laying their foundations on emergent behaviors, and bringing the audience to intervene in the evolutionary course of the simulations, CEs seem to be mature ontologies of systemic-open-works. However, the ontology of CEs does not exhaust itself with the production of novelty and the exhibition of multiple scales of visual and audio complexity. They are more than accelerated versions of Calder's mobiles for the digital ages.

CEs are a sub-genre of ALife art, which is art drawing on ALife and is discussed in great extent in Mitchell Whitelaw's *Metacreation: Art and Artificial life*. [13] ALife is a sub-field of Artificial Intelligence which focuses on computational systems mimicking some of the processes of natural life and evolution. Whitelaw sees ALife-art as a natural follow up of the modernist attempt to imitate not only the appearance of nature but also its systems of functioning. [13] The practitioners agenda appears to be ambitious, and is inscribed with an interest in questioning life itself. The project of ALife is the chimera of exploring "Life-as-it-could-be." [10] The strong claim of ALife is that life is reducible to information, and as such, ALife models can extend the knowledge in biology. Artistic uses of ALife inherit this dialectics/ethics.

This forces a change of perspective in the analysis, moving away from mere pictorial and chromatic spheres. According to the anthropologist Stephen Helmreich, cultural pre-conceptions from the dominant western culture such as dominant notions of gender, monogamous families, heterosexual and productive sex appear widespread across models camouflaged in a Darwinian struggle for survival. [7]

To Helmreich, authors of CEs rather than neutral modelers of life actively shape the world and its narrative re-inscribing cultural values in the simulations: they "transport received stories into new hardware." [7] If in the inception of ALife Christopher Langton described it as "life-as-it-could-be", Helmreich argues that these constructions "are built from specific visions of Life-as-we-know-it." [7]

This presence of the authorial hand is also identified by literary critic Katherine Hayles: "Analogy is not incidental or belated but central to the program's artifactual design." [5] She reminds us, "in these representations, authorial intention, biomorphic interpretation and the program's operations are so interwoven that is impossible to separate..." [5] Hayles continues to say "statements about the program's operation and interpretations of its meaning are in continuous interplay with each other." [5] The difference between the material space of the computer and the imagined space appears blurred. In the imaginary space, one 'hungry' creature moves towards another. In the material space, segments of code instruct an agent that as a consequence of the state of some variable, below a certain threshold the agent will adjust its variables defining its position to those of some other agent which global pattern is compatible.

Hayles puts it clearly: it is a narrative that "changes electric polarities on silicon into a high drama of a Darwinian struggle for survival and reproduction." [5] Behaviors restricted to organisms appear juxtaposed with the execution of segments of code in the informational domain. Assumptions we have about natural behavior are transported into the narrative when these two spaces collapse.

John Holland, one of the leading pioneers of ALife, refers to models as maps or cartoons of life. Some features are captured, emphasized, exaggerated while some others are neglected or removed. As in cartooning the skill goes into choosing what is to be emphasized and what is to be thrown away. [8] Practitioners appear, as such, as promoters of a spectacle (in Barthes terms), orchestrators of representations of life. Referring to CEs as representations Holland implicitly concedes that we are operating in the literary realm: the power of discourse and the identification of the audience and its practitioners with a shared common narrative. It is this literary and metaphoric process which transports into the narrative the meaning of death or birth to squares disappearing or appearing in a simulation.

3 Generative narrative

Departing from the understanding of CEs, firstly, as representations of life permeated by structural gaps which are filled by narrative processes; and secondly, as open-works which dynamic interaction of components generates new relationships in a potentially endless evolution, we can start building a theoretical framework under which light we can formalize the narrative process.

As seen earlier, Katherine Hayles alludes to the active role of the viewer, filling in the gaps in the narrative, by the transition from the material to the imaginary spaces. She emphasizes these as works in which the author, the viewer, and the model are connected parts in a gestalt where meaning results from this relationship. [6] Flickering pixels in the screen might become 'alive' in the mind of the beholder when the appropriate story is associated. This comes in accord with the concept of the actant from the actor-network-theory (ANT). Latour disputes any distinction between nature as opposed to culture. In the actor-network-theory an actant is any intervenient, be it human or non-human, in a momentary network of forces in a given situation, in a dynamic network of relationships. [11]

The first of the actants we will discuss is the shared context or story. Lisbeth Klastrup is an internet theorist who studied the poetics of virtual worlds. In her study of the 'worldness' of virtual world. Klastrup addresses this concept as 'interpretative framework'. The world as interpretative framework, or fiction, is the concept or story behind the world. It constitutes a reference from which the actions makes sense to participants; for instance the story of its creation and evolution, the cosmology of its inhabitants. [9]

The interpretative framework contributes significantly to situate the elements in a common and shared territory, a contextual space and time.

In Klastrop's media-inclusive proposition, textuality is described as 'the place of the reader and text in the process of reading. The text contains signs that the reader, in the process of reading, decodes and interprets, be it graphical, auditive or verbal signs'. She continues 'the text does not necessarily need to be written text, but can be all forms of cultural artifacts with a signifying function.' [9] Extending the notion to 'multiuser textuality' this author widens the notion of textual construction to encompass the networked aspects participating in the interactive experience of the world, as well as the agency from all the human participants in the virtual world. With CEs this textuality also include actants such as the computational forms of life, as well as the processes in the rendering pipeline, or yet the vertices of a 3D-surface (We will illustrate this further in the case study, when some of these elements are brought to the center of the narrative process). In Jane Prophet's *Tecnosphere*, for instance, when the user is selecting a creature to be either a carnivore or an herbivore they are actively participating in the construction of a narrative process which will unfold throughout the 'lifetime' of that creature. The emails the creature will 'send' later informing about who it has fought against or ate are actants which will reinforce this dialectics.

Equipped with this framework we will now attempt to formalize a notion of generative narrative in CEs. Generative narrative is a term we borrow from electronic literature, which is found in [2] to describe some works where integral or partial components of the text are automatically generated, such as in the case of *Prolix* by Christophe Petchanatz, a playable generator. [12] Generative describes here an automatic (re)construction of the system (be it partial or integral).

Deriving from these premises we start by situating the narrative of CEs as the model of story which emerges from the dynamic interactions from the author, the viewer, the computer where the model runs, and the agency of the creatures in the virtual world. Generative narrative can be understood as a dynamic form of narrative emerging by this network of relationships as time flows. A free-understanding of generative narrative is about narratives where the system not only adds new events to the world but, in doing so, it reinvents itself. The author sets the system, the initial conditions of the story which then unfolds autonomously, living a life of its own. This autonomous life might, in turn, recreate the system in feedback loops, in an auto-catalytic process. The interplay of the components generates new behaviors or properties. The system might even generate behaviors which re-define the rules of the evolution of the system. The system and the emergent story become inseparable from each other.

In summary, in CEs, the narrative is emergent. Meaning is conveyed from the textuality of the CE, a by-product of the conjugation of the interpretative framework and the material aspects such as sounds, or textures implemented as 3D surfaces, or the processes modeled describing the behaviors. The final interpretation of the work incorporates the agency of a triangle in a 3D-mesh of the landscape, and the process driving the way a certain character is displayed, and the text in the website where the work is accessed, and the website itself, and the viewer who accesses the work. The resulting dynamics produces an ever-changing landscape, a context for interpretation.

4 Senhora da Graça

We introduce in the discussion a case study to analyse this narrative process at play in conveying meaning in an artistic CE, Senhora da Graça. [1] Senhora da Graça denominates a valley, near Sabugal, in

North-East Portugal, which in 2000 was submerged to build a new dam. The artwork *Senhora da Graça* is a memorial in the form of a virtual ecosystem composed of clouds of rain, soil, plants, herbivores, carnivores and scavengers. With the help of photographs taken at the site from which this work borrows the name, around 20 years ago, this work was aimed to reference a period or moment in time. However, the photographs of reference are presented in a distorted and somehow abstract way, when applied as 3d textures in the exterior surfaces of the creatures (skin), on the soil, and in the skies of the virtual world.

As the surfaces aren't static, the generative dynamic of the interaction of creatures permanently rebuilds the world and the shapes. As a result, the photographs keep making reference to a moment of time, however, the living and dynamic frames where they are applied (the creature's bodies) as 3d textures, evolve over time making them unrecognizable. Having lost their pictorial value as photographic object they keep maintaining their conceptual and chromatic values. In a metaphoric way, as it happens with the submerged place of *Senhora da Graça*, in this work the photographs appear unrecognizable, they are shadows of the moment they evoke.

Accessing *Senhora da Graça*, a spectacle is offered, a parade of abstractions that we have difficulty unravelling any meaning, if any at all. However, in the website we have access to a text describing the intentions and motivation, illustrated with an introductory short story. Whereas, in an operatic performance we need a libretto to help to introduce and decode the narrative, the interpretative framework.

One of the keys for our discussion resides in this libretto, precisely, since it provides access to the interpretative framework. Gilles Deleuze, in his two volumes of work dedicated to cinema, suggests the 'mental automaton', a circuit made of body, flesh and light, which is formed by the cinematographic object and the viewer. This cybernetic circuit is initiated by the sensory stimuli of the electrical pulses from the movie and the nerve signals and impulses that are generated in the viewer. Once this circuit is established the impulses no longer come from the movie but from the circuits formed by the brain, 'mixing a multitude of cinematic signs with bodies.' [3] Extending this concept to *Senhora da Graça*, we can observe that the object virtual world and the libretto combine to feed this mental automaton.

In *Senhora da Graça* the virtual world is part of a circuit initiated with the introductory text. Due to its material properties, the virtual world has an obvious interest as isolated sculptural and material object. But the semiotic significant is entirely dependent on the textual narrative, derived from the mental automaton. However, this relation is not passive as the virtual world also prolong, continue and expand the narrative: The texts finds a natural follow up in the deformation of the surfaces and the evolution of the creatures/pictures in the virtual world. In this sense, the virtual world has a dual and hybrid quality since it is only complete when in the presence of the libretto, its extension. Rather than finishing with their physical boundaries the virtual world extends and is extended with/by the mental automaton.

5 Conclusions

CEs offer rich endeavors to those authors interested in exploring this unconventional artistic practice. We have attempted to lay out a theoretical space for situating and experiencing CEs as instruments for artistic dialogues. We have discussed how the story and the material properties of the CE participate in the narrative and might be incorporated in the artistic concept. This process is open and other actants might be invoked in this process.

We propose the term generative narrative as a conceptual tool in understanding these works. We saw earlier how works which are structurally incomplete, which the audience completes in the act of perceiving the work, are suggested to be open by Umberto Eco. On the other hand N. Katherine Hayles emphasizes a gap between the material space and the imaginary space in ALife. This gap, she argues, is filled by narrative. A series of actants (in the ANT sense) are invoked by the artists/modelers filling in these gaps, generating a field for interpretation. Generative narrative is the textual construction articulating the different aspects which define the CE (the actants). This goes to include a wide network of influences, from the language of code used in the implementation of the virtual system, to the the story read by the audience or its processes of diffusion. This process is dynamic and non-stop. Due to its open nature works evolve when new relations and interactions establish and evolve in time.

6 Acknowledgments

Fundação para a Ciência e a Tecnologia assisted in the production of this paper in the form of the studentship SFRH / BD / 61293 / 2009 to Mr. Antunes.

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ART, TECHNOLOGY AND BUSINESS: TRANS-DISCIPLINARY TEAMS IN THE ARTS

Gavin Artz

The Ancillary IPs hypothesis theorises that, despite myths to the contrary, artist regularly work in trans-disciplinary teams and this way of working is analogues to the entrepreneurial team found in business.

For the past two years I have been working with The Australian Network for Art and Technology (ANAT) to develop and test a model for working commercially with creativity, a model where artists aren't diminished in their creative work, but are able to generate a broad range of revenue from their activity. This Ancillary IPs hypothesis theorises that, despite myths to the contrary, artist regularly work in trans-disciplinary teams and this way of working is analogues to the entrepreneurial team found in business. The hypothesis predicts that if this trans-disciplinary team is recognised while the relationships and commercialisation processes are managed within specific criteria, artists can successfully commercialise intellectual property embed in their artwork while enhancing their artistic output.

In part 1 of this paper an overview of the Ancillary IPs hypothesis is presented with a focus on the proposed five factors for successful commercial outcomes from creative practice. Part 2 tests the Ancillary IPs hypothesis against the findings of an Australian Network for Art and Technology (ANAT) and University of Adelaide's Entrepreneurship, Commercialisation and Innovation Centre (ECIC) investigation into artists attitudes toward career, collaboration and commercial elements of their practice and a case study of the company rezon8 .

Part 1 : The Ancillary IPs Hypothesis

OVERVIEW

Unlike previous representations of the Ancillary IPs hypothesis, in this paper two separate but linked concepts are articulated to make reference to research and case studies more clear, Ancillary IPs and the Ancillary IPs Process.

Ancillary IPs occurs when, in the course of an artist pursuing their vision, they encounter a technical road block that requires the development of a technology, device, process or code. [1] These tools can then become the basis for IP commercialisation.

The **Ancillary IPs Process** addresses commercialisation of Ancillary IPs by seeking to unlock the pent up commercial value in creative activities, while ensuring sustainable ongoing creativity based on equitable trans-disciplinary collaborations.

ANCILLARY IPS: CREATIVITY AND INNOVATION

Creativity relies on intrinsic motivation expressed through curiosity and self directed exploration. [2] Because of this artists are internally motivated to create and discover what does not yet exist and overcome the problems that arise through that creative process. This intrinsic motivation is what drives artists to create intellectual property on an ongoing basis.

A commercialisation process benefits from high level artistic process, because this process relies on sound problem discovery [3] but problems that we did not know existed and problems that often seem unrelated to present concerns. This approach to problem finding sets artist outside of the marketing concept in a commercial sense [4], but makes them perfectly placed to deal with disruptive technology as detailed by Moore. [5] Because artists are engaged in research questions or cultural activity they are often reaching into an unknown, yet linked future. In a sense they are long range strategic problem finders. This means that artists are continually uncovering problems that will have general applicability into the future. But artists can only serve in this capacity if they are left to be creative. It is the open ended nature of creativity that underwrites its value, or to put it another way, personal creativity is diminished when put to work for someone else's ends.

Whether we acknowledge them or not Ancillary IPs are being created all the time as a part of creative practice. The hallmarks of this creative practice are the application of ideas to people, culture and society and this is why the creation of Ancillary IPs in the arts can be seen as an innovation process.

ANCILLARY IPS PROCESS: INNOVATION AND COMMERCIALISATION

The Ancillary IPs Process is based on the commercialisation of the tools that artists create to overcome technical roadblocks, not through setting them the task of applied research or commercialisation. Because of this the Ancillary IPs Process does not compromise valuable intrinsic motivation and because the tool (IP) has been created to resolve a real problem, it is just a case of finding a like problem that the tool can resolve; giving a considerable head start in the R&D process. In this way an appropriate commercial value is placed on purely creative endeavours.

This aspect of Ancillary IPs Process is what sets it about form innovations based on coincidence. The Ancillary IPs Process is not an accidental discovery of a property or application; it is a repeatable approach for any instance of creative practice.

ANCILLARY IPS PROCESS: ENTREPRENEURSHIP AND COMMERCIALISATION

The Ancillary IPs Process relies on collaboration for commercialisation outcomes. This is necessary so as not to compromise the intrinsic motivation. There is a myth that artists are not interested in commercial outcomes. Artists are driven by intrinsic motivations, but this does not mean they do not value commercial activity and the revenue that can come from it. Usually artists do not wish to become business people, but they value their creative output in commercial sense.

In the Ancillary IPs Process commercialisation happens in the context of a team, much like an entrepreneurial team, enabling the artist to focus on the creative process. Artists work with technologists, business people, or any other skills they need to create work while having access to the commercial world.

By doing this, creative practice is placed in a value network as opposed to a value chain, creating a more sophisticated relationship that can transfer the tangible and intangible value. [6] It is the ongoing mutual benefit and the ability of all members of the team to focus on their intrinsic motivations that allows creativity to be successfully commercialised.

This is a trans-disciplinary approach that doesn't separate the non-applied research from an applied research process. By having an integrated approach, innovation processes can be condensed, R&D cycles sped up.

ANCILLARY IPS PREDICTS

The Ancillary IPs hypothesis predicts that if five factors are included in a commercial process then successful long term business outcomes will be possible without diminishing the intrinsic motivation that drives creativity – these are:

1. **Invention and Innovation:** Because Ancillary IPs are created to resolve a real problem they are closer to innovation than pure invention. There is far greater potential to find like problems than from pure invention.
2. **Commercial Partnerships:** There are no expectations that creative practitioners involved in the Ancillary IPs model will have business skills. While it is ideal that a level of knowledge is developed to ensure appropriate choices are made, the Ancillary IPs hypothesis is more focused on commercial partnerships.
3. **Personal Benefit:** There is an expectation that the creator of the Ancillary IPs will derive an ongoing and direct benefit from commercial applications. This is a part of the commercial partnership that allows for ongoing IP to be created.
4. **Personal Vision:** Ancillary IPs relies on the personal vision of the creative practitioner. Their value is in this vision and everything is to be done to allow them to focus on the end vision.
5. **Process:** Because of its importance the personal vision cannot be curbed to commercial ends. Commercial opportunities come from overcoming roadblocks, not the end result of creative work.

Part 2: The Research

In 2010 ANAT and the ECIC undertook a survey of creative practitioners who had an existing connection with ANAT. The survey was entitled “*Creative Collaboration, Commercialisation and Career Study.*” [7] Those surveyed had been added to ANAT's database either through choice or through participating in ANAT program. The survey itself had two key questions to uncover in relation to Ancillary IPs. One being what is the nature of collaborations in the arts? The other, what is the attitude toward commercial outcomes in the arts?

METHOD

A questionnaire was circulated to 2150 people who were on the ANAT data base, with 36 respondents.

LIMITATIONS

1. The use of ANAT's database selects people who have an interest in collaborations between art, science and technology and who have knowledge of work ANAT has undertaken in the area being investigated.
2. The number of respondents were too low to conclusively resolve the questions.

RESEARCH CONCLUSIONS

The key findings that relate to the Ancillary IPs hypothesis were:

1. 94% of respondents answered yes to the question - "Are you interested in exploring the commercial opportunities that may evolve from, or be embedded within your creative work?"
2. 81% of respondents answered yes to the question - "Are you interested in professional development (seminars, workshops) for commercialisation and / or business developments of creative practices?"
3. That 61% of respondents collaborate with others to develop work and that 61% of collaborations for this purpose are with people outside of the arts.

While there are limitations to this research it indicates that there is a strong interest in commercial activity from some in the arts and there is a corresponding strong interest in professional development in business skills. The research also indicated that a majority of artists collaborate in creating work and that a majority of these collaborations are with people outside of the arts.

CASE STUDY

This case study was based on interviews with rezon8 founders *Jimmy McGilchrist and Darryn van Someren* between April 2010 and May 2011. rezon8 is a fast growth technology start up. In early 2010 they presented a work at Melbourne's Federation Square entitled "Swarm".

"Devised and created by Adelaide-based artist Jimmy McGilchrist and programmer Darryn van Someren, this Next Wave Time Lapse work for March uses human recognition technology and the Fed Cam live feed to create extraordinarily graceful and surreal effects. As audience members stand motionless in Federation Square, virtual butterflies will gravitate towards their on-screen image swarming around them. As the viewer moves suddenly within the frame, the butterflies will dissipate, following them for a time before fluttering off into the distance. Ulanda Blair - Next Wave" <http://rezon8.com.au/case-studies>

To execute this project they developed proprietary software and a unique configuration of existing hardware that placed an audience inside the digital screen, allowing the audience to use their body to interact with digital content.

Through MEGA SA's entrepreneurial, professional development program I reviewed the work of rezon8 using the Ancillary IP's hypothesis as a framework to assess their creative work for unique intellectual property. In this case it was the software created to drive their custom configured hardware. The software was developed to resolve technical problems associated with the realisation of their art work. It was then a case of finding a like problem in a different industry where this tool could be applied.

rezon8 applied the IP to the outdoor digital signage industry. Their IP has been able to resolve the problem of measuring consumer interaction with signage as well as increasing the engagement with this advertising investment. They have built a sustainable business that is currently negotiating export of a hardware solution developed from the initial art work. The company continues to use their art practice as a combination of ongoing technology R&D and market testing of ideas and technology.

CASE STUDY CONCLUSIONS: THE FIVE FACTORS AND REZON8

1. ***Invention and Innovation:*** This factor was borne out in that the IP created for the art work could easily be applied in a different market and the application was resolved to the point that rezon8, as a commercial business, could commence commercial work immediately and within six months became a sustainable consulting business with longer term automated digital outdoor signage solution in development.
2. ***Commercial Partnerships:*** The development of this factor followed the predicated path, but also showed a deviation. In line with the hypothesis rezon8 has built strategic partnerships with other business to help deliver a complete product. They formed an entrepreneurial team made up of the core team including an advisory board, but deviated from the hypothesis by creating a virtual entrepreneurial team by including a mentoring business relationship with a business that creates animations for advertising and more distant, but none the less supportive, relationships with advertising agencies. While commercial in nature these relationships developed on the lines of strategic partnerships rather than purely transactional relationships. The other point of deviation is that the hypothesis predicts that a partnership would need to be formed with a business, or individuals that could deliver commercialisation outcomes while the artist continued a creative path. As indicated as common practice by the “*Creative Collaboration, Commercialisation and Career Study*” rezon8 was an artistic practice based on a trans-disciplinary collaboration. The core team has creative, technology and business skills supported by an in-depth professional develop experience in entrepreneurship. This built-in entrepreneurial team helped rezon8 to quickly build a functioning business with the artistic process conceptualised as research and development for the commercial outcomes. This conception of artistic practice as research and development in a commercial business builds on the existing hypothesis in an unexpected way.
3. ***Personal Benefit:*** Due to the deviation from the hypothesis of commercial partners rezon8 was able to maintain ownership and control of IP. By not having to trade a share in this intellectual property for commercialisation partners they always maintained a personal benefit from the artistic IP created.
4. ***Personal Vision:*** rezon8 fulfilled this factor in that the personal vision of the “swarm” meant that the intrinsic motivated creativity encountered technical problems, that when overcome, made up the commercial basis for rezon8. The added dimension to the model came about when this personal vision was contextualised as the research and development investment of rezon8. The new venture, rezon8, invests in the production of interactive art work for events and festivals at a loss. This investment pushes the development of technology while enabling instant, large scale customer feedback from event and festival attendees.
5. ***Process:*** While the process of integrating creativity deviated from the model, it was in sympathy with the overall concept of Ancillary IPs. rezon8 have built and develop the business through looking to the tools created in an artwork, but they have brought that art work creation into their business processes. This integration brings the business closer to the creative process, but the creative process does not produce the end product sold through the business.

Conclusion and Further Research

There are two beliefs prevalent in the arts that prevent artists from being a part of the mainstream economy and more importantly it prevents artist from making a living from their creative practices.

One is that artists do not have an interest in commercial activity. The other is that the artist is a lone creative visionary. This paper begins to reveal these beliefs as unfounded and that a much more complex relationship exists between business and the arts than is commonly recognised. This paper concludes that the Ancillary IPs hypothesis shows promise in articulating more clearly this complex relationship and how this relationship can be leveraged to benefit both artist and the economies in which they work.

The case study reveals that Ancillary IPs are clearly being created in some areas of the arts, but further case studies in other industries and other areas of the arts are need to demonstrate possible general applicability of the hypothesis. Also further research and modifications to the hypothesis are required before the Ancillary IPs Process can become a deeply applicable model. The recommendations being:

1. More rigorous research with a greater sample size needs to be undertaken to get a reliable picture of attitudes to commercialisation of IP in the arts and the nature of collaboration in contemporary creative practice.
2. That the five factors that underpin a successful Ancillary IPs Process needs to be reviewed in the light of the "Creative Collaboration, Commercialisation and Career Study" and real world cases. This review will need to take into account the potential for greater integration of commercialisation process and artistic creativity and to allow for the contextualization of artistic practise as research and development activities in a commercial enterprise. Further to this a more complex view of the entrepreneurial team needs to be considered to take into account a broader array of the types of commercial partnerships that can exist in a value network that links the artistic with the commercial.
3. The notion of knowledge transfer of the tools developed to overcome roadblocks in achieving a creative vision to like problems in other industries or markets needs to be better understood from a process stand point.

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VOICES IN MACHINIMA AS A SITUATIONIST DÉTOURNEMENT OF VIDEO AND COMPUTER GAMES

Isabelle Arvers

Voices in machinimas appear as the human side of the virtual game environment. Behind the gamer performance that produces character actions, dialogs create the sense and the drama of the movie. Voices, through dialogs, songs, or voice-overs, also become game modifications, as they transform the original game function and offer a new set of meaning to the virtual realities initially created by game developers



The French Democracy, 2005, Alex Chan, Machinima directed with the game: The Movies, © Lionheads Studios

The word machinima mixes the idea of cinema, machine, and animation. It is the encounter between a film and a game, in which gamers become film directors. As a technique to produce films, machinima is a new cinematographic genre.

Voices in machinimas appear as the human side of the virtual game environment. Behind the gamer performance that produces character actions, dialogs create the sense and the drama of the movie. Voices, through dialogs, songs, or voice-overs, also become game modifications, as they transform the original game function and offer a new set of meaning to the virtual realities initially created by game developers.

In the art world, works making games, modifying games, and using games for machinima can be seen as following in the footsteps of Dadaism and Surrealism, which saw play and entertainment as the most subversive and also as the ultimate forms of art. Even outside of an art context, it is important to remember that as soon as the first personal computer was created, MIT computer scientists hacked the computer code to conceive the first digital creation: Spacewar! And Spacewar! was a computer game. So, if computer game history is related to the roots of digital creation and to digital code hacking, machinima can be understood to follow this tradition.

Machinima represents the particular moment when gamers begin to produce content and where games become tools of expression. These movies are mostly narrative, but they can also be experimental, artistic, or related to music, documentaries, ads, and feature films. They can be seen as a new way of representation in the digital age, along with 3D animation, digital cinema or video.

During the riots in Paris in 2005, Alex Chan, a graphic designer based in the northern suburbs of Paris, directed the short film *The French Democracy* using The Movies game engine, from a game created by Peter Molyneux. This was the first political machinima. It explained how and why the riots began. Alex Chan had never made a movie before, but faced with the media coverage of the riots, which was massively biased against the youngsters, he decided to give them a voice by the means of a game. He directed the movie in one week, subtitled it in English, and posted it on The Movies website. Alex Chan's movie was downloaded more than a million times.

Alex Chan chose to subtitle *The French democracy* in English to be able to post it on The Movies website, but also because he wanted it to be watched by the international machinima community. As Cillian Lyons, resident machinima artist and producer for Machinimasia (The Asian Machinima Festival), also explains, voice is something they specially discussed for Asian movies because the majority of the machinima community is English-speaking. [1]

Apart from the gamer's performance that creates the action in the movies, voices are the human side of machinima. As machinima are entirely shot in 3D environments of games, they are made of digital images. These images are part of already existing worlds, and even if machinima directors modify them, they remain digital and mostly unchanged. Each of these worlds bring their own visual imaginary: a fantasy world with World of Warcraft, an urban modern life with The Sims, futuristic landscapes with Halo, or a violent suburb atmosphere with Grand Theft Auto, for instance.

More than an aesthetic, it is a 3D vision of the world—a digital representation of it. And in these environments, voices transform the meaning of the scenes. Originally imagined by hard-core gamers, machinima are a way to come back to the virtual universes with which they feel so comfortable. Voices are a tool to appropriate these worlds by adding their own stories, thanks to dialogs between characters. Voices bring sensitivity, a sense of humor, or an absurd touch to these virtual spaces.

Games are created to be fun, rather than to make you laugh or cry—even though this sometimes happens. Nevertheless, machinima voices offer a new set of emotions and allow us to perceive images in a different manner by getting closer to game characters and landscapes. It also brings an “as if analog” feeling to the machinima—a counterpoint to the digital. There is a sort of uncanny feel here, as the voice and image are out of phase with the warmth of the voice and the coolness of the image. The performed and scripted quality of the voice gives a not-digital feel to this very digital world. Polygons

and avatars take a new dimension, a new personality—as if a human body would fill them up and breathe inside.

Furthermore, the voice works to bring about a reverse engineering of a mass consumerist object into a tool of narrative and artistic expression. With machinima, we can talk about an emerging game play: an unsuspected use of a game for an artistic objective. Here play operates in the fullest, most artistic sense of the word. Even though, of course, now ads are also created using the machinima techniques—for commercial purposes— nevertheless, machinima remains a tool that is available to anybody who has a game engine at home and who wants to express themselves by combining voice with the games' visuals.

By using virtual spaces and changing the perspective as an artistic strategy, machinima allow a distanced critique of a simulated world. They tend to erase the boundaries between reality and fiction and redefine the transgressive power of the game. "There, where the real world is changing into simple images, simple images become real human beings and efficient motivations for an hypnotic behavior." [2] They reactualize the Situationist conception of cinema, in which images, voices in dialogs or interviews or voice over, act as different layers of content. Guy Debord and Gil J. Wolman, in a joint text written in 1956, added to the Situationist theory of *détournement* [3] the point that cinema is the most efficient method of *détournement* where *détournement* tends to pure beauty. It doesn't need to be a parody or a critique of a movie. In this text, both authors argue for the strategy of diverting a movie like the racist one *Birth of a Nation* by D. W. Griffith by just changing the soundtrack in order to denounce the horrors of the war and the KKK activities.

Some machinima, like *This Spartan Life (TSL)* by Chris Burke, or *Landlord Vigilante*, written by artist Eddo Stern and writer Jessica Hutchins, could, I would argue, be compared to Situationist movies. This Spartan Life is a talk show about digital and gaming culture directed in the virtual space of the network game *Halo 2*. Chris Burke, aka Damian Lacaedemion, has special guests in the game: for instance, he interviewed Bob Stein on the future of the book and Malcolm McLaren about the 8bit music and the roots of punk music. As the talk show is filmed, players are fighting around Lacaedemion and his guests. Sometimes, other gamers, who don't realize that a talk show is happening live in the game, actually kill the guests. For instance, while Damian Lacaedemion was defending Malcolm McLaren against futuristic monsters, we could follow McLaren walking through the digital landscape, in the shape of a strange purple animal, talking about "magnificent failures better than little successes." [4]

Landlord Vigilante combines the visuals of a car chase with the musings of a cab driver about the economy. It allows a second level of reading the images. Based on a true story about their ex-landlady, *Landlord Vigilante* is an artistic monologue of a women cab driver directed in the game *Grand Theft Auto*, according to its makers, because of its gritty depiction of Los Angeles and prospective violence, and the Sims, which is property/real-estate oriented. Each game presents a "world" or narrative arena confined by a set of prescribed, "rules"—we wanted to stretch and play with those rules to tell our own post-traumatic story. [5]

Why do I compare these machinimas to Situationist movies? Because, thanks to the voices, they add an artistic or a theoretical content to the images of violent games, and for that reason they are close to a Situationist film like *Can Dialectics Break Bricks?* This movie, produced in 1973 by the French director René Viénet used a martial arts film—The Crush by Doo Kwang Gee—overdubbed with French revolutionary philosophic ideas. It was a radical critic of cultural hegemony designed to entertain and amuse, while demonstrating a number of artistic and political points.

With machinima, the images come from a video or a computer game but are then transformed into short films. Though the Situationists had the idea of using a movie as the most efficient détournement because of cinema's capacity to reach a popular audience, new kinds of audience encounters are now possible with the extensive games audiences. Machinima began in the gamers' community, but it has expanded very quickly. The audience tends to be quite young and movies are often downloaded millions of times on websites such as Machinima.com or The Movies, YouTube and Dailymotion also distribute these films widely. Among the varying kinds of machinima, some like TSL or others mentioned earlier offer an alternative vision of the world. And it is voice, in particular, which gives the detoured edge to these machinima.

As Roland Barthes wrote, the grain of the voice is an "erotic mix between the language and the tone." [6] In the human voice, the body travels from thought to its expression as language. Joseph Beuys once said during a conference given at the *Dokumenta VI* in 1977, that voice is a sculpture of the thought. [7] It is the information sculpted by the air through the organs. It transforms the immateriality of thinking into materiality by bringing the body inside the sound.

Voice reflects the idea of alterity and the relationship to another person. Voice is the simultaneous presence and absence of human corporeality. Voice is the content and the meaning in language but also the sound of a person and their body through time and space. With recorded voices in cinema, the grain of the voice takes another dimension: it is the "anonymous body of the actor in my ear." [8] As we move into the digital domain, this materiality of voice is essential to machinimas and their virtual game spaces. Besides the narrative in the dialog writing, the voice over represents a huge part of machinimas. Paul Marino talks about it as the "humanness that is otherwise missing from the digital package":

The voices of actors in machinimas "animate" the virtual spaces. They give life and personality to digital puppets, which were not a priori conceived by the game developers to have dialogs with each other. And as machinima directors cannot play with the facial expressions of their digital puppets in the way cinema does with live actors, or in traditional animation, they need to work very precisely on the voice-over.

To illustrate the importance of this voice-over matter, the machinima *Bill & John* tells the story of two advanced pilots inside a military flight simulation game: *Lock On: Modern Air Combat*. The directors took the opposite of the cold atmosphere of the game by the use of hilarious and absurd dialogs between the two pilots. The first scene begins with two military flight aircrafts on the ground, and one of the pilots amazed by the beauty of a flight aircraft yells:

"What-the-fuck, mo-ther fu-cker, that's fucking beautiful! Hey John! See, even after all these years, I'll never get tired of it . . . That's when I think to myself . . ." "Bill! You piss me off! You've been pissing me off for ages! But now you're really pissing off! You yell, you yell! It pisses me off hearing you yelling from the minute you get up . . . and you, you, and you yell, You never shut up. ""Well, You're in a great mood this morning . . . we're gonna have a great day. ""But do you realize that because of you . . . we are stuck in these shit wrecks!"

As they try to take off, the more foolish of the two pilots has forgotten how to begin and launches a missile instead: "All right, now, let me see, slowly give it some gas . . . and ease up on the brakes. Wrong switch. So, brake, switch . . . and releasing brakes. Wrong switch again. Oh right . . . there it is . . . and let up on the brakes."

The authors played with the rhythm of each scene during the editing:

The silences in the sound track were more than essential to give life to characters we do not see on the screen but from which we guess the gesture. . . . The succession of uncontrolled events provoked by the two protagonists creates a distance effect which puts the spectator in the skin of an accessory witness. [9]

In a game, the imagination of players is driven by the actions of the play, scripts, and maps. In machinimas, our imagination can fill the empty spaces between the dialogs and, as with books, we can imagine what is happening inbetween. As in traditional cinema, we find elliptic narration in machinimas, which allows us to take an active part in the story and to go back to a more personal perception of what the images mean.

Bill & John reminds us of Beckett's absurd theater, where clownish characters hold discussions in strange spaces—cold and mostly empty. This confrontation between humorously edged and warmly human dialogs and “cold” digital spaces is also prominent in the voice performances of the famous machinima series *Red vs Blue*. Shot in the futuristic game *Halo 2*, it tells the story of the battle between Red and Blue. These two characters seem to be lost in the game space, talking endlessly about the meaning of life and death. The dialogs' script and its deep sense of humor is what made the series enormously successful and allowed machinima in general to achieve significant success.

Interviewed about the link between the dialogs written for the serial *Red vs Blue* and the Theater of the absurd, Burnie Burns agrees: "Yes, especially the early episodes. We wanted to know what would happen to videogame characters after the games were turned off. It's funny to think that these guys would have a life where they wait for someone to come along and play their game." [10]

This shift in meaning isn't only used for comic effect in machinima. To create a fictional effect and an artistic work by a détournement of game images, Eddo Stern and Jessica Hutchins worked differently with voice. *Landlord Vigilante* is a monologue and the tone of the voice is monotonous. Based on a true story that happened to the authors with their ex-landlady who tried to dupe them, as mentioned previously, we follow the thoughts of a woman cab driver. The authors chose third-person narration because it "gives the whole (first-person) monologue a disembodied, artificial feeling. Maybe these qualities allow it to be perceived as a subjective work of fiction, instead of blatant slander!" [11] Watching *Landlord Vigilante* is like traveling constantly from the text of the voice to the images, as if sometimes they couldn't be connected to each other, operating on different levels of perception.

This unnatural voice deals with the complexity of human identity and the boundaries between the fake and reality. We are lost, because we'd like to believe in 3D images, but we know that it's a fiction, and the monologue reinforces this feeling, because it doesn't seem to take any side. It doesn't entirely reveal the identity of this woman.

Even though there are some machinimas that are not dubbed with voice for technical or linguistic reasons, I have tried to demonstrate that voice in general constitutes the major game modification in machinima. Following the hacking tradition, voice gives another dimension to the use of games, transforming them into a form of expression. Voices in machinima provoke a shift in meaning similar to the way that Pascal Bonitzer discusses in relation to voice-over in cinema—they reopen the doors of our imagination as we watch preexisting digital images.

"To bring the focus to the off screen space, as another screen space," writes Pascal Bonitzer, "is to displace the focus from the gaze onto the voice, to release the voice from the dictates of the reality of the image." [12] Voices move our mind to another range of perception, diverting us to immerse totally in digital images and allowing us to keep a critical distance while getting closer to characters.

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PIXEL PERFECT: PERFORMATIVITY AND SELF-PORTRAITURE

Erin Ashenhurst

In the context of social media, a 'profile picture' calls for the production of a thumbnail-sized self. The individual may act as both subject and photographer while building and tending to an online identity in moments of seclusion. Exploring self-portraiture and visual narrative, this research offers a study of the web-based project *At Arm's Length*, and works to provoke discussion around performativity and the construction of identity.



Fig 1. Wide-shot in apartment from At Arm's Length, Erin Ashenhurst, 2010



Fig 2. Wide-shot on beach from At Arm's Length, Erin Ashenhurst, 2010



Fig 3. Portrait on beach from *At Arm's Length*, Erin Ashenhurst, 2010

INTRODUCTION

The photograph is the advent of myself as other, a cunning dissociation of consciousness from identity.
 – Roland Barthes [1]

On busy city sidewalks, an emerging hazard may be observed – the digitally engaged pedestrian. Easily identified by their down-turned gazes, they are those for whom the act of walking has been compromised in order to accommodate their absorption in the screens of Smartphones. Leisurely-paced steps act to lessen the likelihood of blind collision while they read emails, compose texts, select music, or post images. The increasing number of mobile devices outfitted with camera technology suggests that more and more individuals hold the potential to create and share photographs almost spontaneously. Digital images are used as evidence to construct identity and illustrate personal histories on blogs, photo-sharing and social networking sites. While these images are framed as representations of lived experience, they are fraught with fabricated cues. Vamping for the lens, or gazing off towards fictional distractions to suggest ‘candid’ shots, subjects use performativity to compose their preferred visual narratives. In the operating room of programs such as Adobe Photoshop, remaining flaws may be smoothed, filtered, nipped and tucked.

Offering irreverent commentary on the practice of self-portraiture, *At Arm's Length* begins with a set of images resembling those commonly used in online profiles. This set is matched by a series of wide-shots exposing the contrasting environments existing beyond the boundaries of the subject's framing.

PERFORMATIVITY AND THE IMAGE

Although the process of staging a photograph is far from that of Robert Cornelius' first daguerreotype self-portrait in 1839, there remains a moment of arrested movement in which the subject, aware of the camera, surrenders to a pose. During the course of creating this pose, the subject anticipates how he or she may appear in the future photograph. Of his role as the subject of a photograph, Roland Bathes wrote, "once I feel myself observed by the lens, everything changes, I constitute myself in the process of 'posing', and I instantly make another body for myself, I transform myself in advance into an image." [2] This transformation, the styling of the body into a deliberate, static self, can be examined as a performance. In his book *The Presentation of Self in Everyday Life* (1952), sociologist Erving Goffman examined human interaction and how subjects use performance to construct social identities. Exploiting the language of dramaturgy, Goffman describes the subject as a social actor using various contexts as theatrical stages. [3] Assisted by props and costumes, an actor may learn to navigate a breadth of social environments by recognizing the codes of behaviour expected in each, and adjusting his or her performance to fit.

In order to communicate qualities and character in the static performance of a photograph, subjects must depend solely on visual cues devised from cultural archetypes and social norms. Visual anthropologist Richard Chalfen proposed that when photographed, "the individual can choose and select among many codes, each of which may have its own standard of 'correctness.'" [4] Framing gender as a matter of performativity, Judith Butler noted that constructs such as femininity "cannot be understood outside a process of iterability, a regularized and constrained repetition of norms." [5] In this sense, the performance of the subject is not purely voluntary. In order to be understood, behavior is constrained by a specific set of conventions that are built through collective repetition. Each culture can be said to provide "a tool kit of habits, skills, styles, perspectives, norms, roles, and values out of which each individual can construct a potentially unique strategy of action." [6] It is with these tools that a subject builds an identity and a visual narrative as the subject of an image. In her photographic series, *Untitled Film Stills* (1977–1980), artist Cindy Sherman manipulated the tools of cinematic culture to fashion herself into archetypal female characters surrounded by narrative clues. In artist JK Keller's experiments in self-documentary, props, costuming, and grooming, are treated as playful trappings. Over the course of 12 years, Keller took headshots of himself posed with an expression reminiscent of those required for government-issued identification. Edited in rapid succession, the portraits taken from 1998–2006 make up the video project *Living My Life Faster*. In the space of two minutes, the video shows a quick moment of each image – creating an effect that holds Keller's face as a constant while tendrils of hair, beards, moustaches, glasses and clothing thrash in a frenzy across him. Behind the variations in styling, Keller presents a starkly coherent self, face broadening slightly as it ages by the second.

In the research for the project *At Arm's Length*, I considered a selection of profile pictures posted on Facebook and noted consistencies in the compositions of the portraits. Some subjects made eye contact with mischievous grins, or glanced to one side of the camera, chins tilted down coyly. The observable similarities of expression used for self-portraits shared online point to this repetitive use of cultural norms to inform a subject's performance and aid in his or her transformation into a perfected, readable document. As Chalfen wrote, "the fact that people sharing the same culture will independently agree so well on their patterned choices of appropriate imagery and associated conventions makes many collections of personal pictures 'look' so much alike." [7]

Although camera phones have extended the role of photography in creating and maintaining social relationships, researcher Lisa Gye found, "the typical photo taken with a phone is often reinforcing the user's identity more than their ties to a group." [8] The pursuit of identity as described by anthropologist Marcel Mauss is based on the "universal desire to master consciousness and project a social presence."

[9] Sites such as Facebook have developed systems with which individuals can articulate their social identities through text and images, while the designs of many camera phones favour subjects ranging from 2–5 feet in distance from the lens. This facilitates the production of self-portraits taken by holding the camera at arm's length.

AT ARM'S LENGTH

Presented in a web browser, *At Arm's Length* begins with three close-cropped headshots arranged in horizontal alignment against a white background. The minimalist design can be seen as a nod to the supposed 'neutrality' of the white-walled gallery or the interface of many photo-sharing sites such as Flickr.com. The series of images feature the same woman. In each, she appears distinctly styled in a new setting. Without interaction, the brightness of the images gently dwindles. If a cursor moves over an image, it changes to a quick frame featuring the animated shutter of iPhone's camera application before revealing the portrait at full opacity. Lines of text commenting on the image appear in sequence below. A click of the mouse transitions the frame to a wide shot revealing the environment surrounding the woman at the moment the selected portrait was taken. In these wide shots, the subject can be seen acting as her own photographer, camera phone obstructing her face. With the woman setting up for the portrait, the viewer is privy to the cues of the setting existing beyond the portrait's framing.

In the first portrait, the subject is sporting dark sunglasses, which obscure her eyes. A necklace and the straps of a halter-top are all that is seen of her attire. In the background, the stretch of sand and sliver of water suggest a beach under a bright sky. Mousing over the image reveals several lines of text below including the words, "OMG, you live in such a beautiful city! I would kill for a decent beach day!" The style of writing mimics comments made by users of online photo-sharing sites. Positioned below the image, it acts as captioning and plants suggestion.

Transitioning to the wide-shot, the subject can be viewed posing in a small section of beach. The landscape is unpopulated by other visitors with the exception of two figures sitting on a log far in the background. A large portion of sky is grey and cloudy while thin, bare trees appear in the foreground. The subject is seated on a log with her fall coat pushed off her shoulders and shirt pulled down to accommodate only bikini straps in the frame of the portrait. On a stump beside her rests an umbrella along with her assorted belongings. The culmination of cues points away from the portrait's sunny scheme towards a moment of fantasy created by an individual in the solitary hours of an autumn day.

Clicking on the wide shot of the beach brings the viewer back to the series of portraits. In the second image, the woman smiles radiantly into the camera. With a bright feather in her hair, the straps of a red satin dress frame the necklaces adorning her collarbone. Resting the mouse over the image, text materializing below comments "Holy hot dress! Looks like I missed another crazy night..."

The wide shot reveals the woman taking her own picture while seated in a room. The room is yellow with recessed archways framing the wall above a marble floor. The subject sits cross-legged in a party dress. Around the corner, another woman in a red coat can be seen walking by a wall of elevators. The space appears to be a lobby. The viewer may speculate that the two women are connected. Perhaps the subject is waiting for a friend and taking pictures to pass time in the sterile surroundings. Or perhaps the

red-coated woman is a stranger about to come around the corner and trigger momentary embarrassment with a glance towards the vamping photographer. The subject may be on the cusp of a glamorous social event, but in the flash of her portrait, she is alone.

The third portrait features the woman, hair sleek, looking intently into the camera. The subject's wide eyes and the subtle downward tilt of her chin verge on seductive. Hovering the mouse over the image, the text, "Hey sexy, we still on for Tuesday?" appears among the comments below. The background is flat beige with an edge of wooden furniture peeking out on one side. With only the neck of a white sweater featured in the portrait, the viewer may be surprised by the wide shot's colorful display: the subject stands to one side of a cluttered apartment, framing her picture so that an overhead light is hitting half of her face. While her hair appears to have been freshly groomed, the portion of her body cropped out of the portrait is dressed in a casual sweatshirt and red flannel pajama pants patterned comically with moose silhouettes. The wide shot reads as a private instance, where subject and setting are unprepared for public presentation beyond the tight framing of her camera phone.

Online, the activity of people watching translates into trolling through profiles. The portraits of *At Arm's Length* are revealed as charades. In the wide shots, the woman's environment is dressed with ample signs while the viewer is positioned as a voyeur, a passer-by. In the act of creating the portrait, the woman's performance is for her own camera. The viewer watches as the subject constructs herself as an object, seemingly oblivious to the viewer's omnipotent gaze.

The images can be seen to culminate as a character study of an individual constructing a socially engaging self through photography, while her daily life consists of time spent alone. Taken as a general comment, *At Arm's Length* points to questions around the disconnection between the lived experiences of subjects and the constructed self they choose to project in their online identities. Photographic activity becomes about imitation, trickery, and assembling a tableau of ciphers.

LITTLE NARRATIVES

In the mid-1990's, Mark Poster described the World Wide Web as a host for "little narratives". Poster wrote, "the internet seems to encourage the proliferation of stories, local narratives without any totalizing gestures and it places senders and addressees in symmetrical relations." [10] Over a decade later, social media has made the development and maintenance of personal narratives a daily activity for many. While consumer culture emphasizes the importance of the individual through services and products geared towards self-advancement, the Internet provides the ability for a person to act as a brand. The beliefs and values of the brand are enforced through the constant generation of words and images. Researcher of visual culture Liz Wells, writes of the modernization of society since the Industrial Revolution, commenting, "The twentieth-century consumer-led economy has shifted these new individuals away from a culture based on work and self-discipline to one based on libidinous gratification which encourages us all to identify our pleasures in order to develop and refine them." [11] Online profiles ask users to list their 'likes' and 'interests', integrating these factors into the concept of a user's identity.

Much like a traditional marketing campaign or the building of a cult, a poorly managed Twitter feed may result in decreased 'followers'. Sites such as Facebook or MySpace act as contemporary promenades with conventions mirroring those of late eighteenth century Parisian bourgeoisie. Historian Richard Sennett described the lively city centres of Europe as stages upon which individuals continuously practised

being “somebody.” [12] In contemporary society, the offering of virtual gifts, acknowledgements or salutations written on each other’s pages, allow individuals to publicly enforce social connections within the larger group. Online ‘friendship’ is obtained through a standardized click-through process that may simply result in the viewing of another’s page (comparable to ‘people watching’), rather than any written exchange.

In *At Arm’s Length*, the performativity involved in the process of creating self-portraits is inspected through irreverent fabrications. The narrative of a subject’s headshot is seen in a new light when matched with a wide-shot revealing the moment of capture. However, one may question if any image can really be measured as ‘truthful’? In an interview American photographer Richard Avedon has commented, “a portrait is not a likeness. The moment an emotion or fact is transformed into a photograph it is no longer a fact but an opinion. There is no such thing as inaccuracy in a photograph. All photographs are accurate. None of them is truth.” [13] In *At Arm’s Length*, narrative folds in on itself: an actress plays a character, performing as a subject, parading as her idealized self. In the performances of social actors, Goffman warned, “A single note out of key can disrupt the tone of an entire performance.” [14]

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REENGINEERING OF THE SENSORIUM AND IMAGINARY LANDSCAPE: MIXED REALITY

Leci Augusto

The landscape is understood as the space of experience dominated by the embodiment of subjects and objects. Thus, the space is part of the body. Body and space are blended, mixed, impregnated because the spatial structure of landscape belongs to the description of our surroundings. Geotagging transforms the territorial configuration of the landscape by creating an abstract projection of connection nodes in a global cartography.



Fig 1. 14 BIS, Funarte Square, Brasília, 2010



Fig 2. 14 BIS, Latin America Memorial, Sao Paulo, 2010

Art and Landscape: Mixed Reality

The landscape as the mediator between different levels of perception and action is also a testimony of the civilizing process that is taking place today in the Occidental Arts. The art has not always resulted exclusively of visual processes, it has also been conceptual throughout its history, revealing the typical phases of development in which it will come to pass in time. The idealization of natural elements resulted in the creation of gardens, as appropriate places for the admiration of nature and it has also resurfaced the Garden of Eden's myth.

Centuries after, the painting presents great panoramas, totalizing visions, geographies of places and the human attitude against the ground space, the construction of a miniature world in scales perceptible with the body in the ground, as in the landscape paintings of Pieter Brueghel (1525 -1569).

In Europe of the sixteenth and seventeenth centuries, both artists and cartographers used the same vocabulary to describe the geographical representations. Jean Marc Besse [6] states that 'painters and geographers share the same cognitive attitude and visual acuity,' they depart from the empirical experience of understanding the world's signs, driven by the same interests: the rock colors, the movement of river water and the wind. The cartographer and the painter share not only the perception of the earth's surface, but mainly its subject – the landscape. It is important to emphasize the relevance of Leonard da Vinci, who, during his several journeys, studied the geological formations of the areas he visited. This work is expressed in the local maps and feature richness of detail considered in greater degree to cartographers. The artist painted the rivers, settlements and valleys in such a realistic way that we have the impression of looking at a landscape from an airplane.'

In the late 50's – another representative historic moment – artists are once more interested in the landscape with the purpose of relating it to artistic productions. Land Art offers a way of relating art to the countryside in the context of *Earth Art*, and the 'protagonist of the aesthetic experience is the environment, space in which individuals interact, while *the other*, in the broadest sense, in which the *self* is confronted.' [3] It also means a rupture with the traditional position of the viewer, who in *land art* no longer gazes upon the work of art, but inhabits it, expanding the notion of a conceived, perceived space. Instead of mapping roads and landscapes, the art intends to record processes of translating contemplation into human action next to the landscapes that it constantly modifies.

In this century the work with technologies, the 3D world of computers has the ability to take the viewer back to the scene. They allow the creation as action, the works are interventions of embedded data in the urban and cultural spheres, creating geographies of emergency and transience, updated in time of the communication context. Louise Poissant, [8] regarding the interactivity in the Arts, states 'that it is a response to the feeling that the audience has to be aware of: they want to move the representation registration to that of the action.' In fact, interaction prevents the user to maintain the distance, the intellectual distance, the criticism, compared to the *trompe-l'oeil* of the view paintings, in which three-dimensional perspective functioned as a visual recovery of a tactile experience.

Interactivity art has also demystified the role of the artist as a creative author, giving him/her the function of a context designer, the one who prepares the ground to the reception. The work presents itself as a field of co-creation in which users interact with the device and create a renewed aesthetic experience.

The work *14 Bis* is an intervention in Augmented Reality (AR) done collaboratively, in honor of the 50th anniversary of Brasília (Brazil). It had as a poetic reference the song *Tropicália*, by Caetano Veloso, which deals with the construction of the new capital of Brazil, inaugurated in 1960 and idealized by the architects Oscar Niemeyer e Lúcio Costa. Recreating Santos Dumont's (1873 - 1932) invention as a synthetic image, the project was idealized with the intention of honoring the Brazilian cultural thought.

So that the work exists in Mixed and Augmented Reality, it was necessary to measure the point of appearance, by using a GPS (Global Positioning System) and inserting the geodesic coordinates in the *Layar* software, a free browser for augmented reality, compatible to the android operating system used in cellphones and tablets.

The Mixed Reality (MR) is the hybridization that connects us to the physical and digital worlds, the 'real' and the 'virtual.' Domingues [4] states that 'with today's locative, ubiquitous and mobile technologies, men realize their fictional desires of living in parallel worlds, in paracosmos that mix physical materiality and data immateriality, placing them in what we call cybrid realities to cybrid existence.

In loco, this cybridization is reflected in the level of the sensory perception of a combination of information from the physical environment, from the user and the data generated by a computer system and from the mobile and locative interface. Thus, we have the anthropomorphic proposal of Peter Anders, [1] based on the human body, in the experience, between space and information. Domingues [4] states that the subject *cybridizes* himself/herself in the subject-object-environment flow.

The boundaries of our body

Human sensory changes in the speed of the development of technological devices. In nineteenth century industrial capitalism, the machines actually assume the leadership of the economy. Transforming cities, taking farmers from their lands and turning them into workers, change customs and the relationship with the world. Charles Chaplin criticized this poetically in the film *Modern Times*, whose protagonist works continuously on a treadmill, making himself an integral part of the machine, his consciousness remains attached to the mechanical movements. With the advent of high-tech machines, computers, robotics and telematics, in post-industrial capitalism, machines get an amazing power and influence over subjectivity. This happens because these new technologies, besides their ubiquitous nature, possess a high degree of sophistication that promotes, with the wishes production system, characteristic of this model of capitalism, a high degree of interaction and relationships. That is, machines are not only literally negotiating human relationships through a variety of portable devices such as telephones, television, computers, and the Internet, but also promoting the emergence of a direct human-machine relationship in the re-engineering of senses and of life.

We model our sensuousness in accordance with the mechanic production of subjectivity that behaves like mechanic gears on the interactive interfaces. Roy Ascott [2] states that the interaction presupposes a reciprocal effect, so that one thing affects the other, adds or transforms, and if we are dealing with a work of art, a 'transformation of consciousness' that emerges from the experience, in which the opened meaning models new relations to reality, new ways of feeling in a context interactions with artistic systems. In mixed reality worlds the interaction between art objects and protagonists allows a multisensory that carries the redefinition of the human.

In cyberculture, artistic creation with new interactive media shows a rejection of old art categories, in its place, new fields that pervade the human-computer interaction (HIC), imposing 'shareable affections' within a set of sensory experiences that coordinate signals and that trigger the body's perception and proprioception. Diana Domingues in the article- *Ciberadão e a magia das cibercoisas pervasivas* , speaks of a 'biology of interactivity' in which the technological apparatus adapted to the biological alters profoundly the sensory synthesis, because they allow symbiotic processes that expand to virtual worlds the body's and environment's natural signals in regenerative changes. The author alludes to the book *Symbiotic Man: Perspectives for the Third Millennium*, by Joël de Rosnay, that describes the evolution of the interfaces between humans and machines and speaks of numerous functions that are being studied from biological signals, access roads funding and decoding of information.

Interacting on the landscape where the plane *14 Bis* is located, the body falls into places, searches territories, compares landscapes and explores relationships. In this sense, the landscape is contaminated by this being-in-the-world, ontological condition of coexistence. And so, Geography, as the science of concrete things, allows itself to be invaded by external processes, categories that transcend disciplinary boundaries and the landscape defines itself in categories of natural and artificial objects that make up space and time for the present and past relations of human work, confirming the assumptions of Milton Santos [9] that 'nothing is fixed nor motionless in the landscape'. Therefore, the human experience of occupying the existential space creates natural and artificial streams, vital directions and of interactions with communication networks, demonstrating the existence of the symbiotic relationship between human - landscape - communication network, and in 'the frequency of shifts reveals in the human, a body with a materially sensitive certitude.'

Merleau - Ponty's [7] *Phenomenology of Perception*, aiming to reach the things themselves, describes the phenomena as they are experienced by consciousness, understands that subject and object are interrelated in the process of dialectical knowledge. He assumes that world knowledge, even in scientific terms, is given from the subject's own experience in the world also as is a body in the world. The body is the subject of perception, seen as the source of the senses, as significance of the relationship of the subject in the world, and the subject seen in its totality, in its structure of relations to things around it. The author draws attention to what is perceived by man, the phenomenon, occurs in a field which he belongs. The emphasis is to demonstrate that the relationship in the world is *physique* and always significant.

From this perspective, consciousness is not separated from lived experience, it acquires a meaning and is defined as perception, so that there is no separation and opposition between the rational and sensitive data in the act of apprehension of things, and our experiences are the source of all knowledge acquired in the world and the world comes into existence only when we assign it a meaning. Thus, consciousness is continually tuning itself to the world.

Derrick de Kerkhove [5] speaks of how media edits the environment and therefore the user, our sensorium is being edited by the daily media, by electronic devices: cellphones, computers, tablets affect our strategies of information processing. The author also speaks of a 'biotechnology,' this experience can be observed with the use of sensors and devices attached to the body as a means of projecting emotions, media that act as interfaces between language, body and world. In the book *culture the consciousness subjectivity performs a psychosensorial synthesis within the body*. With the screen, there is a reversal of the consciousness to the outside, it is projected on the screen, we enter in the information.

Interaction in the mixed landscape of the *14 Bis* reveals the state of presence-absence as a result of computer vision of cellphone cameras and of post-extrusion biological human vision, the act of looking is shared between the eye of the satellite in the sky and the human eye projected on the screen of the phone, neuropsychophysiology expanding human perception that characterizes the biocybrid condition. Our cognitive and motion models are expanded in the landscape, geo-referenced by a Geographic Information System (GIS) and by computer codes information. And the body attached to the mobile device translates the reengineering of sensuousness.

The living space in this context is presented as historical and mixed reality in which man is a modifying agent. And time updates the immateriality of the work process which, when completed, returns to the void in its timelessness. Because the 'real' time, in *14 Bis* is just the point in time in which it updates the system that is composed by the user's input. In this sense, the concept of time is linked to interactivity, the presence of the object *hic et nunc* before the perceiving subject.

In the art's field, the landscape intervention in mixed and augmented reality represents acultural transgression that moves from the excessive, the unknown, the hidden, to clarity, to order, the revealed in the becoming of the cybrid landscape, the one that results from the sum of natural elements with the cyber data, which the ordered set of categories creates a new meaning to the everyday experience in the space in the reengineering of life.

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HYPERPRESENT AVATARS

Elif Ayiter, Selim Balcisoy & Murat Germen

This paper will discuss two student projects, which were developed during a hybrid course between art/design and computer sciences at Sabancı University; both of which involve the creation of two avatars whose visual attributes are determined by data feeds from 'Real Life' sources by following up from Biocca's concept of the Cyborg's Dilemma, we will describe the creative and technological processes which went into the materialization of these two avatars.



Fig 1. The Facebook Avatar, virtual photograph by Elif Ayiter.



Fig 2. The Miro Avatar, virtual photograph by Elif Ayiter

Hyperpresence

If the body is the primary communication hardware, then what is its relationship to a medium which is made up of steel, plastic, and silicon given that instead of pulsing blood, pulses of electrons and light animate the computational hardware?

Marshall McLuhan long ago pointed out that communication interfaces attach themselves to the body. In the words of McLuhan, “Media are extensions of the senses,” in that the view of the world associated with print is being replaced by a world view associated with electronic media that stresses feelings and emotions. [1] This is a different vision than Licklider's [2] for whom “mancomputer symbiosis” is a subclass of “man-machine systems” in which the human brain is coupled to its machine counterpart. This coupling of one brain to another made sense in the early days of computing when the communication between human and machine was still one of conversation where instead of a mind communication through a body to another body, we have only two disembodied conversations, a sterile coupling of abstract symbol generators. At the close of 20th century however, the development of advanced computer interfaces is characterized by progressive embodiment. Progressive embodiment is the steadily advancing immersion and coupling of the body to an advanced communication interface.

Intelligence augmentation applies itself to the theory that communication technologies can be cognitive prostheses amplifying or assisting cognitive processes or by developing cognitive skills. This leads to the question, of what it means to be virtually embodied, particularly if this state also contributes to intelligence augmentation. In other words, what are the psychological effects of goals of embodiment in virtual environments? What are the psychological effects of embodiment in virtual environments? Most commonly these are expressed as various forms of ‘presence,’ which is described as the perceptual sensation of being in a place other than where you physically are, or a sense of transportation to a ‘place’ created by media. [3] It is the illusion of ‘being there’ in a virtual space.

Compounding the dual concepts of (virtual) environment and (virtual) agent are Giuseppe Mantovani and Giuseppe Riva's findings which point at the social nature of ‘presence,’ challenging the notion that experiencing a simulated environment is merely a matter of perceiving its objective features: Presence (real or simulated) means that individuals perceive themselves, objects, as well as others not only as situated in an external space but as immersed in a socio-cultural web connected through interactions between objects and people. [4]

This social aspect of ‘presence’ is further picked up by Frank Biocca, who seems to question the issue both from an externalized as well as an internalized viewpoint, bringing to the fore the notion of self-presence:

“When the user's body enters the virtual world and inhabits an avatar, a number of changes in self-presence are possible. Self-presence is defined as the effect of virtual environment on the perception of one's body (i.e., body schema or body image), physiological states, emotional states, perceived traits, and identity. To use a phrase, self-presence refers the effect of the sensory environment on mental models of the self, especially when that model of the self is foregrounded or made salient. As with other forms of presence, designers share the assumption that increases in self-presence are correlated with higher levels of cognitive performance, and, possibly, emotional development. In the words of Socrates, the goal to ‘know thyself’ is a worthy journey. It may be the only journey.” [5]

And it is at this juncture that Biocca formulates a vision, a hypothesis, a wish:

“... it may be possible to develop a medium in which one feels greater “access to the intelligence, intentions, and sensory impressions of another” than is possible in the most intimate face-to-face communication. One aspect of what might be called hyperpresence” (Biocca, 1997) may be possible in the social presence domain as well. Of course, it is hard for us now to imagine a medium that can create greater intimacy than face-to-face communication. But this misses the point of social presence and the very artifice of the body itself. In face-to-face communication the body is used to communicate one’s sensory experiences, observation, and inner states to another. The body is the medium for this transfer. Communication codes such as spoken language and non-verbal codes such as facial expression, posture, touch, and motion are used. But, for example, inner states might be communicated more vividly through the use of sensors that can amplify subtle physiological or nonverbal cues. These can augment the intentional and unintentional cues used in interpersonal communication to assess the emotional states and intentions of others.” [5]

Data Avatars

While Biocca’s deliberations seem to focus on sensor based technologies, there may well be other means of conveying data, which is likely to bring about the communication of inner states, emotional responses and non-verbal clues, including an immediate manifestation of interests and inclinations.

Two avatars which may fulfill such demands, through non-sensor based technologies, were created by two separate groups of students, during different semesters, as course projects for a hybrid art/design and computation course entitled CS450, co-instructed between two artists and one computer scientists at Sabanci University. [6]

Both projects deliberately go against the grain of the prevalent mindsets of metaverse residents which, more often than not, involve a wish for concealment of real life attributes: A study conducted by Brosnan, [7] using 126 participants recruited from Second Life, shows that while the physical persona may be predictive to a certain extent in virtual embodiment, nonetheless in many cases significant differences between physical and virtual appearances and identities is to be expected.

This typical behaviorism is being challenged by bringing data from the physical realm into the metaverse: Rather than create avatars which are vessels of concealment, revelations regarding the physical state of the wearer are being sought. Thus, what is aimed for are wearable virtual technologies which allow their users to be represented in a manner in which both their real life and virtual life traits can be visualized simultaneously, by using data imported from the physical to the virtual realm.

The Miró Avatar

The project originates from the desire to integrate an emotional presence into the World Wide Web. In real life, emotions are not communicated consciously; hence the idea of using Electroencephalography (EEG) to collect a person’s emotions. However, since EEG data cannot have reliable or interpretable meaning concerning any emotional state, one may only speak of collecting the ‘idea’ of one’s emotions. EEG is used to accumulate an individual’s brain signals; signals that occur each moment, unconsciously,

in response to the interaction with the immediate environment. Since it was seen to be desirable to interpret these signals as the idea of one's emotional presence in virtual reality, the three dimensional metaverse of Second Life became a natural platform to apply such a metaphor of reality.

Figure 1: The Miro Avatar, Işıl Demir, Can Şen, Yiğit Yüksel, Second Life, 2008.

The collection of EEG data is done by an open source program, *BrainBay*, which outputs the biosignal as EDF files. These files are converted to ASCII text files with another open source program, *Polyman*. The content of these files are integers between -4000 and 4000. The ASCII files are uploaded to a website from which custom made scripts in Linden Scripting Language (LSL) read the files that contain the EEG data.

The avatar changes according to incoming brain wave. When the avatar is activated the script begins reading data from the server and a change in the shape of the avatar according to the incoming integer values is brought about. Thus the user's brain waves form a virtual manifestation that represents his/her virtual appearance which can also be considered as a metaphor for the representation of one's mind; since, figuratively, what is thus visualized are the person's 'thoughts.'

As far as the creative process is concerned, the visualization of one's emotional presence has been inspired by the idea of the four dimensional painting which Miró proposed in his later years. Thus, the avatar, composed of the various visual elements featured in Miró's paintings, continuously changes its shape and is redrawn, transcending the two and three dimensionality of painting and sculpture. As expected, this representation stands in contradiction to the prevalent tendencies of metaverse and MMORPG players who, will either create accurate physical reflections of themselves by making an avatar corresponding to their actual appearance or conversely by giving the avatar physical traits to which they aspire to in real life, but which are entirely out of their reach in the physical realm.

As a general rule three dimensional virtual spaces tend to be simulations of real spaces and as such they can solely be interacted with and experienced through mental processes which are the visual, auditory, and cognitive stimulations in the brain. So, instead of creating an avatar based on actual physical traits, the output of the project offers to create an alternative visual entity, usable as an avatar, derived from the fact that users cannot have a real physical presence in virtual spaces and the fact that their mental input is the only factor that creates the illusion of presence in a virtual space. Other users can 'see' them, not because they are physically there; but because there is an avatar that is shaped via their thoughts and desires with which one may interact in a manner similar to face-on-face physical interaction. Thus it may be concluded that, in terms of representation, virtual appearance may well rely on the output of unconscious thoughts, which are what is also mirrored in the surrealist approach of Miró's paintings.

The PersonaSkin Avatar

The second project involves an avatar who carries several body attachments which change color saturation values based upon a data feed which is generated from the arts and entertainment section of a facebook user's profile. Although the project was initially intended for real life usage, inspired by an RFID based real life event which tied facebook data to physical bodies, launched in Israel in 2010. However, despite this physical precedent it was decided to first discover the possibilities of identity matching

through accessories and outfits in a virtual world. Thus, a metaverse resident who also owns a facebook account can utilize these attachments to project his/her interests to the outside (virtual) world.

Figure 2: The Personaskin Avatar, Ayse Naz Pelen, Doğukan Malbora, Mustafa Çağrı Güven, Second Life, 2011.

According to Swann's self verification theory, during most social interactions there is a general desire for outside evaluations which verify self-views; in other words, a wish to get others to see us in the way in which we see ourselves. Given that Facebook users create their profiles themselves, very much along the lines in which they want to represent themselves, self verification theory has become an important part of this project. The aim is to achieve an understanding as to how persons may choose to introduce themselves in social networks, real and/or virtual, in order to attain states of self verification through identity matching: The avatar is expected to bring them to the notice of persons of similar facebook status, in terms of the frequency of interests presented in the arts and entertainments section thereof.

In terms of technology the data is being taken out of Facebook via php and a Facebook api. Subsequently the data is sent to a server and from there imported into Second Life, where LSL is being used to embed the data into the objects which represent the various categories either by heightened/lessened saturation values or alternatively through different levels of transparencies.

Questions such as age, sex and geographic location appear to become increasingly less relevant in a metaverse environment, where people seem to interact mainly through their ideologies and their creativity which are taken to be standalone attributes which exist independently of the 'real life' persona behind the keyboard. Under such circumstances an avatar of androgynous appearance, whose adornments are created out of his or her areas of interest seems to be particularly apt design strategy. Since some kind of legend is needed to decipher visualization of the incoming data the skin of the dramatic full avatar also serves as a legend. In cases where residents who wish to go for a more conservative appearance, a t-shirt and various colorized male and female skins are also included in the package.

Conclusion

In the brave new world of three dimensional, online virtual worlds yet another aspect of our grappling with embodiment is coming to the fore. This is in accord with the notion of cyborg as an interface which couples the physical body with technology [8], within which three dimensionally embodied avatars can also be characterized as a form of cyborg coupling. For Biocca this coupling underscores what he calls the cyborg's dilemma, which for him is nothing less than a Faustian tradeoff: "Choose technological embodiment to amplify the body, but beware that your body schema and identity may adapt to this cyborg form." [5]

Thus, a germane question would appear to be whether such attire would be powerful enough to provoke change and transformation not only on the virtual agent but extend its influence into the physical realm, bringing forth new modes of presence as well as self-presence not only in three dimensionally embodied online virtual worlds but also in the one which we inhabit with our flesh and blood selves.

Can avatar attire which reveals, rather than conceals a metaverse resident's persona aid in the process of self-presence and (virtual) self verification? Can personal change be brought about through technologies which not only reveal our pixelated flesh, but also reveal the biological and cultural fields which we

weave around us? Can social interactions be transformed and enhanced through virtual wearables which reveal our inner beings to those around us? Can novel states of creativity and play, of unique observations breeding new forms of authorship and understanding, come about through virtual candor?

While both avatars address these issues, when it comes to the Facebook avatar a further consideration is the integration of a heavily used 'real life' virtual social media platform (Facebook) into the metaverse as a socialization tool is a prolific area for further study.

This text has attempted to discuss some of the technological and artistic means through which such questions may be posited, through two projects employing such devices for the creation of two data driven avatar costumes.

Acknowledgments

We wish to express our heartfelt thanks to our students Işıl Demir, Can Şen, Yiğit Yüksel (Miro Avatar) and Ayşe Naz Pelen, Doğukan Malbora, Mustafa Çağrı Güven (personaskin avatar) for the brilliant work which they accomplished and which provided the material for this text.

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“LPDT2”: LA PLISSURE DU TEXTE 2

Elif Ayiter, Max Moswitzer & Selavy Oh

This paper will discuss the artistic processes involved in the creation of the three dimensional, virtual art installation *La Plissure du Texte 2*, which is the sequel to Roy Ascott’s ground breaking telematically networked art work *La Plissure du Texte*, created in 1983 and shown in Paris at the Musée de l’Art Moderne de la Ville de Paris during that same year. While the underlying concepts of the original art work, as well as its capability of regenerating itself as an entirely novel manifestation based upon the concepts of distributed authorship, textual mobility, emergent semiosis, multiple identity, and participatory poesis will be underlined, the main focus of the text will be upon the creative strategies as well as the technological means through which the architecture was brought about in the contemporary creative environment of the metaverse.



Fig 1.

LPDT2, Avatars playing in text ecology, Second Life, 2010. Architecture showing three dimensional textual deconstruction. Virtual photograph by Elif Ayiter.

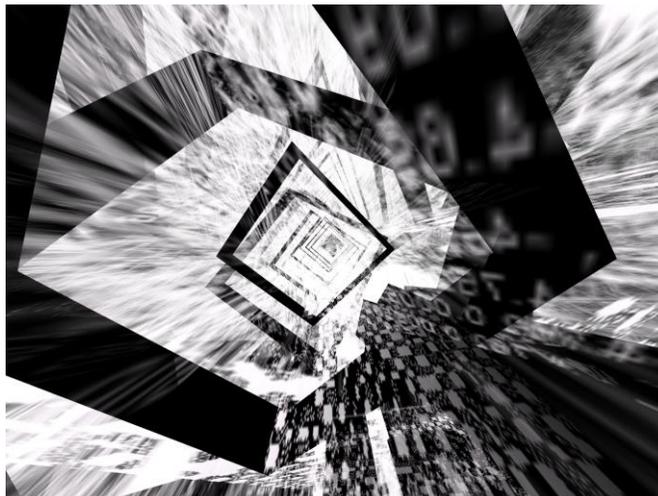


Figure 2: LPDT2, The Letter Cube, Second Life, 2010.

Text Transformed

The title of the project, *La Plissure du Texte: A Planetary Fairy Tale*, alludes to Roland Barthes's book *Le Plaisir du Texte*, a famous discourse on authorship, semantic layering, and the creative role of the reader as the writer of the text. As was also the case in its first incarnation 'distributed authorship,' a term coined by Ascott [1] has been the primary subject of investigation of *La Plissure du Texte 2 (LPDT2)*.

LPDT2 consists of a geography/architecture constructed entirely out of dynamic input text, which is built in a three dimensional, online, participatory virtual world, i.e., a metaverse. While an earlier version of the work was created in the proprietary metaverse of Second Life, the current location is an independent artist's grid called the New Genres Grid which is a part of the newly emerging independent online hypergrid system.

Whereas in 1983 the text was pleated by a number of human storytellers positioned around the globe; in the three dimensionally embodied metaverse the storytellers show novel and unexpected attributes: An emergent textual architecture/geography, as well as a population of autonomous 'robot' avatars which dwell inside this bizarre, literary landscape are pleating the text by acting as communication nodes between the narrators of this new version of the tale: The primary persistent distributed authorship is now accomplished by many writers throughout the ages:

A text generator telling a non-linear, multi-faceted, often times poetic, story harvested from the online *Project Gutenberg* is now distributing its output amongst an architecture and its inhabitants, generating dialogues and iterations taking their trajectories from masterworks of classical literature. The pleating resembles musical sampling, the connection between the sentences fades, text becomes noise, from which the audience generates meaning.

While the virtual structure on the simulator provides the primary layer of pleating by visually mixing the different sources of text, yet another layer of textual input has been provided through which Real Life visitors can contact *LPDT2* by sending SMS messages as well establishing contact via Twitter. All pleated text - the generated, the contributed, and the stored - is simultaneously visible as a massive, ever evolving literary conglomeration. Consequently, the participatory pleating involves not only a meeting of individuals from the same timeframe but extends into a meeting between the past and the present, the bringing together of voices of many ages, then and now.

Although *LPDT2* has been planned as a virtual installation which will nonetheless be predominantly visited in a physical gallery space, the interaction with *LPDT2* is by no means limited to the physical realm alone: Since the project unfolds in a freely accessible, participatory online virtual world visitors throughout the globe can visit the installation with their avatars at any time of their choosing. Thus, an added layer of participation is provided through the three dimensionally embodied interactions of geographically dispersed individuals amongst each other, with the 'resident' robotic avatars, as well as the avatars of the artists themselves.

Creating a System: Generating the Text

Various means of gathering the input text, which would get the entire system operational, were discussed during the early phases of the project; however even from the onset a wish to create a system whereby the text would be generated rather than be contributed by discrete individuals was seen as an

exciting option. That this was a distinct possibility was evident from the existence of various online text generators and particularly the *Dada Engine*. [2]

Although text can be harvested from many different sources such as search engines and even text determined upon by the artists themselves, *Project Gutenberg* [3] proved to be an inspired choice, since not only does the vast repository provide a huge resource, but also the text thus harvested reinterprets Roy Ascott's key phrase of 'distributed authorship' by adding to it a dimension of temporality, if not indeed a transcendence of the here and now: The repository holds over 30,000 texts which have been authored by countless individuals throughout history. However, beyond this aspect of temporality, the startlingly poetic nature of the harvested text has proven itself to be an additional blessing which came out of utilizing *Project Gutenberg* as a means for achieving 'participatory poesis.'

The Dada engine has been reprogrammed to select a sentence (S1) as the starting point and to search for another sentence (S2) in text (T) which is randomly chosen from *Project Gutenberg*. This search procedure is done by first searching the text for the longest word of S1. Once the related word is found the next sentence in the text becomes S2, the assumption being that S2 has a logical relation to S1 through the shared longest word. These consecutive sentences are then sent to an HTML server from where they are mapped onto the architecture. However, the same text generator also sends aggregated text via email directly into the metaverse where it is used as the conversational material for the robotic avatars who are the indigenous residents of the architecture.

Although the text generator does provide the bulk of the text, additional input is provided through an AI system contributed by *i-DAT* from Plymouth University through which visitors to the physical gallery space can send SMS messages which are then displayed as an additional text layer by means of a screen based heads-up-display. Finally, visitors to the virtual installation can send Twitter messages by clicking on a message board which displays a short sentence obtained from the text generator.

The Aesthetics of *LPDT2*: Typographic Deconstruction

In both versions of the build, the architecture stretches itself over an entire metaverse simulator and reaches thousands of virtual meters into the sky, materializing on several platforms which show differences both in terms of visual appearance as well as content. Beyond this, the second incarnation of the project does not copy or mimic what was created in the first version, but strikes out into different visual investigations, searching for novel means of utilizing the generated text in a significantly more restrictive environment: While at a cursory glance the open metaverse operates in a similar fashion to the enclosed world of *Second Life*, nonetheless there are considerable differences when it comes to scripted objects and especially those involving virtual physics. This inevitably necessitated omissions of architectural components upon which the success of the *Second Life* structure had much relied. However, as is all too often the case, necessity gave rise to invention and the second version of *LPDT2* shows marked differences as well as improvements. As an example, the ground level of the second build puts us into a space of letter columns which form sentences from the harvested text. These columns surround a space filled with one hundred tables. Tablets of a single sentence each have then been placed upon these tables and through them the entire table hall bears testimony to the anonymously distributed authorship of the authors coming to us via *Project Gutenberg*, whilst at the same time reflecting upon the symbolic attributes of the 'tabletop,' a recurring conceptual element of Ascott's throughout his artistic career.

What remains consistent throughout both the first as well as the second formation of *LPDT2* is an adherence to the basic key phrases formulated by Ascott: Textual mobility, distributed authorship, emergent semiosis, multiple identity, and participatory poesis.

This brings about the installation in which the generated text is mapped onto architectural components such as floors, walls, as well as spaces which are more difficult to make sense of, such as a strangely configured cube upon which an ever changing text flow is mapped, or an ever changing labyrinth of sentences and letters of the alphabet. While the text can be read as full stand-alone sentences on the individual planes onto which it has been mapped, oftentimes the layering of the planes as well as the juxtaposition of typographic elements results in typographic deconstruction.

In the early 1990's the potential unleashed by desktop publishing and graphics software, allied with the methodological potential offered by deconstructionist philosophy, produced a style of graphic design and typography known sometimes as deconstructionist graphic design, and sometimes as 'The New Typography.' Although the later influx of deconstructionist philosophy cannot be denied, nonetheless deconstructivist typography has its origins in the early 20th Century. Thus, Marinetti writes in 1913:

"My revolution is aimed at the so-called typographical harmony of the page, which is contrary to the flux and reflux, the leaps and bursts of style that run through the page... With this typographical revolution and this multicolored variety in the letters I mean to redouble the expressive force of words." [4]

Modernist typography had engaged in such structural games, even before Marinetti. The printed word was liberated from printing's traditional constraints by Stéphane Mallarmé with *Un Coup de dés* in 1897, pioneering an expressive form of visual presentation for poetic language. One might have expected Marinetti to enthuse over *Un Coup de dés*, however he had other views:

"Moreover, I combat Mallarmé's static ideal with this typographical revolution that allows me to impress on the words (already free, dynamic, and torpedo-like) every velocity of the stars, the clouds, aeroplanes, trains, waves, explosives, globules of sea foam, molecules, and atoms." [4]

One of Marinetti's basic Futurist tenets, the relegation of human experience to a continuum of sensations, underlay the techniques he proposed to use in achieving a Futurist literary expression. Marinetti described these procedures by declaring that "nouns will be scattered at random, infinitives with their greater elasticity will replace the pedantic indicative." [5]

Marinetti's attack on typographic convention, taking Mallarmé's work several stages further, had considerable prescience. His directness, vigor and visual augmentation of the power of words, the entire Futurist ethos of treating words as ammunition, helped formulate the solutions which the new needs of the 20th century demanded. [6]

Although separated in time though a period of 80 years, Ellen Lupton seems to pick up on certain aspects of Marinetti's outcry when she sees deconstruction in graphic design as a process – an act of questioning typographic practice. In Derrida's original theory deconstruction asks several questions which are crucial to typographic design as well: How does representation inhabit reality? How does the external appearance of a thing get inside its internal essence? How does the surface get under the skin?

A crucial opposition in Derrida's theory of deconstruction, and one which is also highly pertinent in terms of typographic design, is speech versus writing. The Western philosophical tradition has denigrated writing as an inferior, dead copy of the living, spoken word. When we speak, we draw on our inner consciousness, but when we write, our words are inert and abstract. The written word loses its connection to our inner selves. Language is set adrift.

Parallel questions for graphic design which preoccupy Lupton are how visual form may get inside the 'content' of writing and through what means has typography refused to be a passive, transparent vessel for written texts, instead developing as a system with its own structures and devices throughout the ages? A typographic work can be called 'deconstruction' when it exposes and transforms the established rules of writing, interrupting the sacred 'inside' of content with the profane 'outside' of form. [7]

Added should also be that, more often than not, deconstructionist typography exhibits a fascination with contemporary technology, in both its utopian and dystopian possibilities, as well as its glamour, adopting tropes and strategies of appropriation, juxtaposition, détournement, montage, collage, repetition, facilitated by or reflecting upon the extraordinary capabilities of digital technologies. It is thus of no surprise that the outcome often resonates upon a world of diffused and distributed communication mediated through networks of powerful information technologies. Even when the artifact itself is presented as a static printed page the reference to a cyberspace driven by hypertext is very often implicit, underscoring that "communication for the deconstructivist is no longer linear, but involves instead the provision of many entry and exit points for the increasingly over-stimulated reader." [8] Thus the page is no longer to be just 'read' but also to be 'perceived,' beyond the pure textual content, into all of its associative conjunctions: We are also meant to 'feel' rather than just to 'read' a page.

In *LPDT2* typographic deconstruction is mostly achieved through space; that is the Z axis of virtual three dimensionality. As one wanders through the conglomeration the text planes containing their individually coherent sentences will inevitably fall upon one another, creating overlapping layers and presenting the visitor with configurations which will juxtapose as well as superimpose different sizes and angles comprised of many different sentences, enabling readings which may present many entry and exit points. Since the input text not only manifests upon two dimensional planes but also materializes as three dimensional objects, another juxtaposition which deconstructs the typography is the perception of two dimensional and three dimensional text simultaneously, often one blending into the other, falling upon each other, creating waterfalls and cascades of words, which are indeed meant to be 'felt,' as well as be 'read.' The conversations held by the robotic avatars, as well as the SMS text sent from the physical realm add further layers to this deconstructive process. Furthermore, the entire typographic system is in an ever changing state of flux depending upon the motion and view point of the avatar who traverses it.

This visual deconstruction would appear to enhance the transmission of Ascott's fundamental key phrases: Textual mobility, distributed authorship, emergent semiosis, multiple identity, and participatory poesis are augmented not only through the contributions of the countless historic authors whose words reside inside *Project Gutenberg*, but additionally through the layers of deconstruction which brings these words and sentences together in ever changing novel visual expositions.

Future Work

La Plissure du Texte 2 is expected to be an evolving work which will continue its residency in the meta-verse. As online, three dimensional technologies continue to develop many new interventions to the existent structure, as well as entirely new structures which may or may not emerge from the already existent one can be contemplated: An increasing availability of kinesthetic-somatic interfaces which can be expected to vastly augment avatar agency into states of online hyperpresence, [9] as well as research such as the AMBX system [10] and magnetic levitation haptic interfaces (Berkelmann et al, 1999), are only two of many projects aimed at an enhanced integration of physical and virtual sensory experiences which may vastly enhance, if not indeed fully alter, the adventure of yet to materialize future generations of *LPDT2*.

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A COZY PLACE FOR INVISIBLE FRIENDS

Birgit Bachler

Social networking sites appear to be cozy environments where we can chat with friends and share our daily experiences. But through our continual participation in these spaces we run into new definitions of power and privacy. This talk looks at how our personal data is turned into capital, how we engage in participatory surveillance, and how we have become increasingly dependent upon these market-oriented platforms.

Social networking sites lead us to believe that our social spaces can be expanded using online services. We presume that communication becomes faster, easier and more efficient. Having a profile on a site like Facebook opens up the endless possibilities of online communication, promises constant connection and offers free sharing with the people in our lives. Facebook claims to be a space for real people, giving them the power to share and make the world a more open and connected place. But how are we handling this power?

Before connecting to Facebook, one must fill in a registration form and set up an account. Only registered users can access Facebook, allowing them to find friends, send messages, upload photo albums, write stories and comment on other people's activities.

What social networks are really interested in is their users' personal data, which is of great value to anyone eager to find potential customers (rather than an old high school friend) on Facebook. Personal data is valuable to marketing specialists, since it allows them to identify, understand their target groups, and aim their advertisements directly at potential customers, thus maximising profit.

The data required for setting up a Facebook account includes one's full name, e-mail address, birthday and sex. Providing this data to Facebook turns the anonymous web user into a person with a name, an age and a gender. This data then makes it easier to locate and identify the real-life person behind the profile. Also, the personal data is adapted to fit the requirements of databases. By filling in a registration form, the user agrees to the structure and requirements of text fields and drop-down menus, so that the network can generate a compatible set of data. Jaron Lanier calls this "personal reductionism," something which has always been present in information systems:

"You have to declare your status in reductive ways when you file a tax return. Your real life is represented by a silly, phony set of database entries in order for you to make use of a service in an approximate way. Most people are aware of the difference between reality and database entries when they file taxes." [1]

Social networking turns digital reductionism into a casual element of mediating contacts between new friends. The Facebook 'like' button is a good example of how human affection can be translated into a binary value. Simply clicking a button supersedes the need to think about writing a personal message. The phrase '1 person likes this' then refers to this one person at least taking note of the content and wishing to make this acknowledgment public to other users. Nothing more, nothing less.

Words like ‘friend’ and ‘like’ are overused terms in the realm of Facebook. They can be deployed to express our appreciation not only of actual people, but also activities, companies, brands and products. Such terms create the feeling of a seemingly personal environment. Everything we ‘like’ on Facebook becomes part of our profile. We are described through categories such as music, books, games and sports as well as political views and religious beliefs. These descriptions are a perfect base for a categorising our personal preferences into a target group, which is of interest to marketing specialists. While Facebook suggests that creating a profile of ourselves is a way to express who we are to our friends and family, what we are actually doing is filling in a form that makes it easier for algorithms to analyse us.

We even assist in optimising these categorisations of each other’s content through participatory surveillance. Because we are visible to people who actually know us, we live under constant mutual scrutiny. The ability to comment and react to each other publicly creates a more clearly defined profile. Our friends will share and tag photos of us, which normally we would not proudly present to the public. This form of participatory surveillance subjects us to the feedback of our circle of friends. We control and govern each other by constantly keeping an eye on our thoughts and actions and the accuracy of our data. In other words, we are faced with (and participate in) something Danah Boyd has described as “invisible audiences.” [2] Incidentally, there is no possibility for ‘taking back’ content once it has been posted online. What we are actually dealing with here is a new form of publicity in an environment that wrongly suggests that we are surrounded by nothing but friends and likeable things. And we must constantly reassess our demands for privacy, as both the rules of the platform and the content are constantly changing.

“Even though people obviously communicate online with a specific audience in mind, *e.g.*, their friends, the public nature of online social networking makes the information available to a much larger audience, potentially everyone with access to the Internet.” [3]

The privacy settings on Facebook allow us to control what we are comfortable with showing and sharing. But we can only choose between a set of options relating to the visibility of content. There is no option for deleting content from the Facebook databases. So being visible is key to having a profile on Facebook. When privacy and visibility are so closely tied together, openness can be mistaken for over-exposure, while reticence may raise suspicion. And perhaps the content that we are not comfortable with publically sharing, says more about who we are and who we want to be, than the content through which we allow ourselves to be defined. We can easily become overwhelmed by the complexity of our social circles, and the multitude of our own identities within those circles, not to mention the possibility of these identities interfering with each other. In the swamp of hundreds of online friends, it’s hard to draw a sharp line between public and private content. And as our online networks grow, we run the risk that our engagement with each other becomes less personal and more standardised.

“After our initial introduction to the place and its orgy of transient friendships, most of us only want to bother with people at one degree of separation from ourselves.” [4]

Managing a multitude of online profiles and contact lists becomes a time-consuming business, whose main benefit is to help maximise the profit of advertisers. So why are we participating in this business of sharing and being shared in order to optimise the profit of others? Mark Andrejevic quotes Toby Lester, who refers to the way consumers are compelled to go online as the “tyranny of convenience.” [5] Just as the convenience of shopping online spares us the trouble of going to a store, socialising online spares us the trouble of going out and actually meeting our friends. We should not make the mistake of confusing friendship with a product, which can be easily maintained through a few mouse clicks. And we should be

aware that all the time spent on a social networking site, is ultimately feeding databases with personal, perhaps even intimate data, which is invaluable for Facebook's marketing strategy.

This marketing factor, and the exploitation of user openness, is the basis of Facebook's success. The promise to only bother users with advertisements, which they might actually be interested in, seems to be a winning marketing strategy. Obviously, we accept to generously provide free labour for marketing research, so that we may enjoy the convenience of the social network. Our online presence becomes a product, interesting for marketers and Facebook.

As long as we believe clicking a button can really improve our social status, the trade in our user data will remain big business. While we spend time with our invisible friends online, we risk neglecting our offline relationships. Not only are we responsible for the content we share about ourselves, but also for that which we share about others. In the end we must decide for ourselves, what the role of a commercial website should be when it comes to managing our friendships; and also, how much the limitations of a blue-and-white user interface change the way we see ourselves and our friends.

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A MAZE ABOUT MAIZE: A MESOAMERICAN DIVINITY AND ITS TRANSGENIC AVATARS.

Pat Badani

“Al Grano” project explores GM maize contamination and the risk to biodiversity and cultural diversity in Mexico. Decade-long debates have been re-kindled after the recent lifting of a moratorium forbidding multinationals to conduct GM maize experiments there. The convoluted stakes derive from history, ethnology, sociology, biopolitics, intellectual property, agronomy, ecology, science and technology of maize.



Maize specimens, 2011, Pat Badani, photographic document, © Pat Badani.

Introduction: “Al Grano” Project

“Al Grano” addresses the massive industrialization of corn in North America and transgenic contamination of native maize varieties discovered in 2001 in Mexico, the genetic home of that crop.

This is the first instance of contamination in a crop’s center of diversity and it has ignited a huge world controversy about maize’s genetic code (whether ‘pure’ or genetically manipulated) in the alimentary, political, economic, ethical and symbolic structures entangled in the debates. The “Al Grano” project gives visual and aural access to these structures via an installation that includes a 4-channel-synched-video-playback piece showcasing documentary footage with GM maize debate participants. The video footage is currently being filmed across national borders in the North American Free Trade corridor.

By investigating cross-sections in time and place, the project reveals the multiple viewpoints and discordant voices about issues that affect the environment as much as peoples’ lives – from basic subsistence for small Mexican farm holders, to food safety and physical health for the population-at-large. These issues pose serious questions about the nature of borders and about notions of identity, immunity and contamination.

A contested grain and its contested spaces: North America

Mexico is the center of origin and biological diversity of maize. Domesticated varieties can be traced back to the year 6000 B.C. in the valley of Tehuacan in Puebla, Mexico, where native peoples called it 'Zea mays.' These 'criollo' maize varieties have been maintained in 'milpas,' an advantageous polycultivation system that prevents the risk of crop loss in the event of natural adversity. To this day the 'milpa' provides an essential subsistence strategy for small farm holders because produce is used as food, as crop and as small commodity. Today, maize monocultivation is practiced in large farms in Northern Mexico.

The association between maize and Mexican identity is so central that a commonly used slogan claims: "Sin maíz no hay país!" (Without maize there is no country!) Maize is the cornerstone of ancient Aztec and Mayan cosmologies, and main protagonist in many myths that include the origin of woman and man. [1] Today, maize is considered Mexicans' 'Vitamin T' in a staple diet of Tortillas, Tacos, Tostadas, Totopos, Tlacoyos and Tamales consumed throughout all economic groups. Yet, paradoxically, Mexico is also a large importer of corn from the United States.

Maize was also a staple food for Native Indians in the United States and Canada who equally practiced polycultivation, although these native varieties have mostly disappeared today. European settlers adopted maize cultivation and practiced polycultivation in family farms as early as 1620. Much later, in search of greater profits promised by new technologies and genetic advances introduced in the mid 20th century, farmers were gradually absorbed by agribusiness with its increased specialization, standardization, and corporatization. Polycultivation gave way to monocultivation and this process has impacted the countryside and the family farm as a social body. Today, the United States is the world's largest producer and exporter of yellow corn (mostly transgenic) grown in the Corn Belt encompassing the states of Illinois, Indiana, Ohio, Iowa, Missouri, Kansas, Nebraska, South Dakota, Minnesota and Wisconsin. In Canada, corn is grown mostly in Ontario, Quebec and in Manitoba, yet Canada is a big importer of corn from the United States.

In 1994, with the intention of opening up and facilitating trade, the presidents of Mexico, the United States and Canada, signed the North American Free Trade Agreement that has created intense anti-free trade debates ever since. One argument is that business owners and elites in all three countries have benefited financially, to the detriment of small farmers. Mexicans claim that the most affected are 'campesinos' due to cheap imports supplied by agribusiness from heavily subsidized corn growers in the United States against which they cannot compete. Other important arguments include concerns over gene flow and contamination of native varieties by imported GM corn from the United States that would place the biodiversity of maize in Mexico at risk.

In Mexico the importance of maize is quite different from the importance that the crop has for the other two NAFTA partners, specifically regarding the debates on food sovereignty, land use, biodiversity and biotechnology of maize.

What follows is a discussion about maize primarily focusing on Mexico, because the debates there center on politics that go hand-in-hand with the introduction of new technologies informing the way in which maize is defended today as diverse crop, as food, as commodity, and as cultural symbol.

Maize technologies in Mexico

Maize cultivation and domestication systems and technologies in Mexico have been dynamic, evolving and changing, even to this day, through a type of expansion and innovation that, since the Spanish conquest, has engaged a process of transferring technologies from the global north to the global south with the promise of economic growth. [2] This process is marked by five periods of intense political, social and technological change with the most current one being the Biotechnological Revolution under the neo-liberal regime.

In pre-Hispanic times, the valley of Mexico had a complex system of floating gardens called 'chinampas' maintained by means of an efficient technique of recycling of nutrients, connected by a network of channels of drainage, irrigation and navigation that provided for the livelihood of about one million people. There is evidence that these floating gardens produced many plants and herbs including four to five tons of maize per hectare. Today, the United States averages the same amount per hectare with current technologies. [3]

With the Spanish conquest of Mexico, a long process began where the traditional use of land for 'milpa' cultivation gave way to other methods of cultivation. New agricultural technologies were introduced and the native polycultivation using simple instruments and small-scale farming was gradually replaced by methods and technologies used in Europe, including monocultivation over large expanses of land.

Maize's transgenic avatars: Multiple viewpoints

The convoluted stakes related to GM corn are huge but unevenly distributed. The debates are different in Mexico than what they are in the United States and Canada, because maize has added nutritional, historical and cultural importance there. However, some issues are of concern to the three nations, such as:

Conflicting interests that inhibit collaboration in an interdependent economy; food regulation under food safety laws that jeopardize the survival of small farmers; the remaking of the countryside and the disappearance of the family farm; the increased domination by agribusiness of agricultural land to plant limited crop varieties that gradually destroy biodiversity and erode the environment; the increasing expansion of GM cornfields not to feed people, but to supply a lucrative industry of animal-feed, corn fructose syrup, and bioproducts such as corn ethanol and corn plastics (PLA). [4]

In Mexico, in addition to the above issues, debates also encompass the risk of gene flow and GM contamination of 'criollo' corn varieties. Other arguments include:

Food sovereignty; labor and human rights debates concerning the livelihood of indigenous populations; debates about the importance of traditional maize cultivation for the world at large; debates about the need of government support for sustainable production technologies that include the preservation of traditional methods of agriculture; and debates about the need to protect Mexican genetic maize patrimony. [5]

Embroiled in numerous controversies, corn has become biotech's godsend and curse because of the current inability to identify and anticipate all the hazards involved. What is certain is that agricultural biotechnologies are here to stay. Some experts claim that the biggest risk is not from science and

biotechnology but rather from the control of this knowledge by agribusiness that create monopolies with copyrights and patenting of seeds for profit regardless of the human and environmental consequences (e.g. by Monsanto, Pioneer, Syngenta, DuPont, etc.) In self-defense, industry representatives argue that indigenous Mexican farmers have manipulated corn for centuries to fulfill individual demands, and that today biotech super-giants manipulate corn genetics to do likewise, but with different tools. Yet, this is reductive because although both techniques are aimed at crop improvement, there are many differences between domesticated and genetically engineered crops.

Maize is a self-pollinating plant with male and female parts, and reproduction happens when the plant's male gametes release pollen and fertilize female gametes located in the cobs. Crossbreeding selected plants by transferring pollen of the desired types by hand from plant to plant has been practiced for millennia. Indigenous peoples in Mexico have developed an extraordinary level of expertise throughout generations, obtaining and conserving diverse populations of 'criollo' maize, interchanging seeds with other 'campesinos' as part of ancestral social practices denoting ritual kinship and civil-religious systems that are in place to this day, albeit dwindling; practices that have been an intrinsic part of indigenous Mexican identity. [6]

Agricultural biotechnology uses genetic engineering, tissue culture and other techniques, and transgenic plants are the product of such tools. [7] These maize avatars are not the result of natural crossbreeding or recombination. Transgenic maize is genetically modified in laboratories to develop agronomically desirable traits whereby specific genes are introduced into the maize genome resulting in modifications such as resistance to herbicides and insect pests; mutations that have proven to be problematical at many levels. Moreover, because of the increasing control of agriculture and related biotech research by corporations who not only fund research efforts (Monsanto, Syngenta, etc.) but who also own these GM avatars through copyright laws and patents, farmers cannot save their GM seeds for replanting – contrary to traditional farm practice – forcing them to buy new seed from GM companies each year and to pay these firms a technology fee. This phenomenon places farmers in a pervasive money-spinning loop of government subsidies and corporate control.

Genetically modified maize was grown for the first time in the United States and Canada in 1997. Today, the United States is the world's biggest supplier of transgenic corn. Mexico no longer produces enough corn for local human consumption due to disappearing 'milpas' resulting from obstructive government policies. Yet, paradoxically, it is the large transnational GMO corporations in the United States who value the Mexican 'campesino' technologies most. Unfortunately, transnational corporations appropriate native maize varieties extracting what they find useful to create transgenic avatars for profit, establishing an elaborate system of patenting that ultimately harm 'campesinos.' This has generated great controversy surrounding regulatory frameworks governing the approval, production, use, and trade of crops.

For Mexico, the initial promise that agro-biotechnology would feed the increasing population and prevent starvation has actually resulted in greater social exclusion, greater inequality and a divide between two types of agriculture: the agro-industrial one based in new technological packages with official support; and the small holder, traditional maize production, increasingly cornered in zones of indigenous cultural resistance with little access to government subsidies. NAFTA practically condemned maize to disappear from Mexican commercial production. It is claimed that trade policies have contributed to the devastation of the countryside and of peasant production; to the increasing substitution of polycultivation by monocultivation and the associated risk of biodiversity loss; to water depletion, and to an impoverished soil that now offers diminished yields. All of these factors deeply

affect the livelihood of ‘campesinos’. [8] Indigenous populations argue that the current neoliberal regime considers them backwards and inefficient, and that their policies are forcing them to migrate from the countryside in order to seek employment in local industries or in ‘maquiladoras’ (such as jean factories) and across the border in the United States. This situation further condemns the ‘milpas’ by deskilling a new generation of younger farmers who do not inherit knowledge and expertise about classical plant-breeding developed and transferred from generation to generation for centuries by their elders.

This state of affairs increases Mexican dependency on GM corn imported from the United States, and further aggravates the risk of gene-flow contamination of ‘criollo’ maize. GM seed infiltration through imports and cross-pollination contamination by dominant GM genes are seen as a real danger to biodiversity by some experts, and contested by others. Yet, this type of disagreement points to the real need for caution and regulatory measures.

Sustainable agriculture/sustainable culture

In the United States and Canada the need to feed people at lower costs was the economic and social logic behind the increased industrialization, specialization and marketing of agriculture that began in the mid 20th century. Now, the claim that corporate agriculture and its technologies are the solution for the world’s starving poor is dubious because millions of hectares of land are being used, not to grow staple foods for human consumption, but to grow GM corn for the bioproducts, processed-food, and animal-feed markets. A devastating combination of factors – climate change, depleting natural resources, a global scramble for land and water, the rush to turn food into bioproducts and excessive corporate concentration in the food sector – is creating an era of permanent food crisis that will require radical reform of the international food system.

In earlier decades the ecological question and the complex connections between agricultural technologies, rural and urban life, maize production and the environment, worried very few people. Many now agree that corporate farming causes the decline of family farms and rural communities, threatens the environment and the natural resource base, and compromises the future of society. For some there is now a high/low tech divide. Others see a more hopeful ‘post-industrial’ future, a new paradigm of agriculture informed by ancient agro-ecological technologies combined with supportive state policies. Despite the maze of impediments that make policy amendments difficult due to agribusiness’ influence in government, numerous lobbying groups are making headway in effecting change. For example: NGOs and advocacy groups such as WWF, ETC, ActionAid and Oxfam, lobby for fair shares for the poor in a world of resource scarcity and environmental limits. [9]

In Mexico there are several civil groups and national organizations such as the Coalition in Defense of Maize, and an increased group of academics wishing to maintain traditional native agriculture. Some have been documenting knowledge of seeds and practices that constitute a true patrimony for the country and for the world, and there is now a live seed bank in place (CIMMYT). These actions validate native practices and recognize their scientific expertise.

At present, there is a growing tendency to develop new types of dialogue where tradition and innovation can meet and share a place, thereby extending alternatives and potential for change. Growing consumer worries about how we feed ourselves fuels a paradigm change in agriculture and marketing, and many are developing different models of food production and distribution where valued

goods and services are created by ecologically sound and socially responsible means, customized for specific markets. [10] Some farmers are already venturing into a new era of sustainable agriculture defined as a way of raising food that is economically viable, healthy for consumers, does not harm the environment, supports biodiversity and animal welfare, is socially just, and enhances rural communities. These initiatives proliferating in the 1990's (diversified farming, organic farming, biodynamic farming, urban farming, community supported agriculture, local food chains, etc.) look to combine traditional and contemporary technologies and systems not with the intention of returning to an idealized past, but with the intention of building a different future.

Transdisciplinary research and practice

Informed by the issues discussed above, "Al Grano" delves into new structures for life in the 21st century, seeking to re-define 'growth' for a sustainable future by evaluating knowledge about arcane and contemporary agro-technologies. Throughout the process of collection and interpretation of exploratory documentation, I maintain an inter-subjective role with a broad spectrum of individuals who share their expertise and wisdom: farmers, grocery store owners, agronomists, policy makers, researchers, personalities and the public at-large. The intention is to set in motion receptivity by intertwining research methodologies used in ethnography into my new media artist's tool-kit. These strategies allow me to craft a variety of narrative grounds about issues that are central to my body of work: border-crossings, migration, and foreign status.

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READING LA PLISSURE DU TEXTE "BACKWARDS"

Jan Baetens

In the history of new media art and digital writing, Roy Ascott's *La Plissure du Texte* (1983), has proven a watershed moment. In this paper I will give a historical contextualization of the first work, in order to better understand the challenges of its today's reappropriations.

Don't forget to read

In the history of new media art and digital writing, Roy Ascott's *La Plissure du Texte* (Electra, Musée d'Art Moderne, Paris, 1983), a work using telematics to create in real-time a world-wide, collective narrative (more specifically, a collaborative, multi-player fairy tale), has proven a watershed moment (Plissure, n.d.). Basic concepts and issues of authorship, text, invention, and linearity, among others, have been dramatically redefined as well as implemented in a concrete practice (as much a process in itself as a model for further development) of distributed authorship, text as "work" (instead of "product"), users' participation, and multimedia connectivity, that it is no longer possible to study the art and technology field without taking into account this major achievement.

Putting the stakes of Ascott's involvement with collaborative world-making even higher, the recent upgrade and reconceptualization of this seminal work in the metaverse of Second Life, *LPDT2*, proves that the creative potential of *La Plissure du Texte* is still intact, to say the least (*LPDT2*, 2010). Yet by creating a distance between the "old" and the "new", i.e. by making the (once) "new" now (supposedly) "old", *LPDT2* gives also the opportunity to come back on an aspect that may have been overlooked in the euphoric reception of the truly utopian first version of the work, namely the question of its "reading." So strong has been the emphasis on the shift towards the new paradigm of participation and connectivity, that the very question of the work's reading did no longer seem relevant. Reading instead of "doing", "performing" and "cocreating" *La Plissure du Texte* seemed an example of McLuhan's "rear-view mirror" approach of the future: (1967: 74-75). The neglect of reading, however, is not fully motivated here. First because reading is much more than just decoding the words of a text, it has also to do with the various stances and attitudes one takes towards a work (in this sense, reading has to do with global cognitive and cultural issues of "perception"). Second because Ascott's key innovation has not been made from scratch. *La Plissure du Texte* is indebted to all kind of textual ancestors (texts, models, authors). The revolution it brings about is not a tabula rasa, yet one new (big) leap in the history of art as connectivity, and it is plausible to argue that the relationship with this cultural and literary context –and hence the reading of it– is part of the work itself, so that participation can only be complete if one also takes into account the work's background.

To a certain extent, *LPDT2* functions as a device that reframes *La Plissure du Texte* and forces us to understand it in new ways. In that sense, the rethinking of an old work in and through a new one is not

very different from what had been done in the retrospective of Ascott's work (Plymouth Arts Centre, 2009.) In this retrospective, the curators had made some surprising but very clever choices, for instance by blocking any attempt to make their exhibit "interactive". By confronting the reader instead with the intellectual questions that had triggered Ascott's own artistic ideas, they stimulated the visitors to redo the creative thinking that preceded the realization of the works themselves (see Baetens 2009). To a certain extent, *LPDT2* works the same way: it helps us reread *La Plissure du Texte*, disclosing aspects that may have been gone unnoticed, for being totally self-evident, at the time. Among these aspects, that of the very reading of the work is a crucial one, and it is on this reading issue that I will focus my contribution here.

As already argued, the question "How to read (a work such as *La Plissure du Texte*)?" may be for some a false or even deceptive question. Isn't Ascott's work, they suggest, something that must be "performed" (actively, by what he likes to call a "participator") rather than "read" (more passively, by an ordinary "reader")? True, it would be absurd to ignore the priority given to participation, but that does not mean that the project is not accompanied by a whole set of more or less hidden instructions that do influence our interpretation, our approach and finally also our use of the work, since participation is not something that starts from scratch. Even in the case of works allowing and even encouraging very open forms of participation, as in *La Plissure du Texte*, the reader-participator does not experience the work in a "virginal" way, but is channelled through all kind of pragmatic markers that help make sense of what is about to be read. Many elements of this textual and cultural network that program, although never in a deterministic way, her contact with the work, can be found in the work's "others": paratext (the textual and iconic elements that surround the material appearance of a work), metatext (the critical writings and analyses devoted to a work), hypotext (the works that are adapted or transformed in a given work, which becomes then an inferred version or hypertext of the hypotext), intertext (the textual network that sprawls around a text), and architext (the relationships between a text and the discursive genre or genres it activates) (for an overview, see Genette 1992). A theory and practice of global connectivity as illustrated by the work of Roy Ascott, can of course not ignore the weight of such a network, which implies inevitably a certain number of reading instructions. This is all the more the case since electronic literature, is, contrary to print forms of writing strongly characterized by the blurring of boundaries between the text and its others. In the digital sphere, to avoid or to skip the textual "others" is, practically speaking, almost impossible (or at least much more difficult than in the case traditional print culture, which craves for clear-cut distinctions between the text and its others).

Reading and writing in light of Barthes and the Surrealists

The reader of *La Plissure du texte* has to pass through two major locks (next of course to the dominating discourse on participation, which can be read as the official and authorized user's manual of the work). The first lock is named Roland Barthes, the second one is the *cadavre exquis* technique of French Surrealism.

Barthes's thinking on writing and textual practices is conveyed through a double filter. On the one hand, there is the very title of the work, which is a variation on his famous book *Le Plaisir du texte* (1972). On the other hand, and perhaps more surprisingly, the "meaning" of this book is processed via well-chosen quotations, such as the one that opens today *LPDT2*: "The brio of the text (without which, after all, there is no text), is its will to bliss, just where it exceeds demand, transcends prattle, and whereby it attempts to overflow, to break through...." This quotation, which opens the door to *La Plissure du texte* for the contemporary reader eager to know more about the work, involves a strong interpretation or reinterpretation of Barthes' thinking, for instance by putting between brackets the distinction between *pleasure* (of the "readable" text) and *jouissance* (of the "scriptible" text) while bringing to the fore the semantic fields of "joy" and "innovation". Of course there is absolutely nothing wrong with such an interpretation, for after all this is the way we interact with texts and to refuse interpretation would only signify a lack of connectivity, but the use of Barthes as a self-chosen gateway to the discovery of the work is also open to interpretation and debate, certainly in the case of a temporally evolving readership (hence my emphasis on the Barthes quotation that opens the new version of Ascott's work, *LPDT2*).

But there is also a second cultural reference, that of the Surrealist "exquisite corpse" a method by which a collection of words or images is collectively assembled. Each collaborator adds to a composition in sequence, either by following a rule or by being allowed to see the end of what the previous person contributed. This technique, variously mentioned by Roy Ascott himself, describes quite faithfully the making of *La Plissure du texte*, produced collectively by participants in 8 different locations all over the world. The participants, who had been assigned the role of traditional fairy tale character: princess, witch, fairy godmother, prince etc., did not have to follow a given script or storyline and could therefore only expand on what had been written previously by the other participants. Here as well, the reference to Surrealism, with its numerous attempts to exceed traditional visions of authorship, text, and art, does not come as a surprise. But once again, the (contemporary) reader does not have to take this reference at face value, he or she can on the contrary, question the value of this position which puts a strong claim on what the text actually means (and asking questions on meaning means... starting to read).

In my brief presentation of the role and weight of Roland Barthes as well as of the "exquisite corpse", it has already become clear that issues of chronology and temporality are absolutely crucial. Since we are discussing here the question of rear-view mirror ways of reading and perhaps more specifically the question to what extent *La Plissure du texte* escapes such ways of reading-, the temporal distance between the readers that we are (and we are all today's readers, whatever our tastes or habits may be) and the reading instructions as given by the double mention of Barthes and Surrealism, is all but a detail. As a matter of fact, that distance is a key element in our contemporary reading of both Barthes and Surrealism, since we do no longer read them today as they might have been read in the cultural environment that made the emergence of *La Plissure du texte* possible.

To make a long story short, what has changed is the fact that, for contemporary readers, neither Barthes nor Surrealism (at least not the Surrealism as epitomized in the exquisite corpse and automatic writing in general), are considered good examples of the type of participation and connectivity that Ascott and his friends were looking for. In today's reading of Barthes, who used to define his position as that of the

rearguard of the avant-garde, the feature that is being underlined is the author's *antimodernism* (Compagnon 2005), the melancholic inability to let go certain aspects of the past while embracing more or less enthusiastically the challenges of the future. If we think of Barthes today, we think of Proust, of Stendhal, and above all of Chateaubriand, much more than of the revolutionary visions of textual practice that he has been defending as well. Or to put things even more sharply: if we want to "save" the revolutionary aspects of Ascott's "plissure", we would prefer today a mention of Deleuze's "pli" (fold) rather than one of Barthes's "plaisir". Too strong an emphasis on "pleasure" might jeopardize the understanding of Ascott's major breakthrough.

The case of Surrealism is even clearer (or worse, if one prefers). Since quite some time (and the work by authors such as Maurice Blanchot and Roger Caillois has played an important role in this reinterpretation), automatic writing, of which the exquisite corpse remains a good example, has been accused of doing the contrary of what it claimed to do, namely helping the author to get rid of old-fashioned ideas of literature and authorship, on the one hand, and to discover absolutely new forms of (collaborative) text production, on the other hand. What is being stressed today, is more the counterproductive aspect of these automatisms, which do not foster imagination or invention but which on the contrary condemn the author to mechanically repeat what he or she already knows. And it cannot be denied that most specimens of automatic writing are highly formulaic and weakened by semantic stereotypes and syntactic poverty.

One might object that the (partially) inadequate relationship between the reading that *La Plissure du texte* is expecting (namely a "participation" that goes beyond traditional frontiers between reading and writing, author and reader, etc.) and the concrete reading instructions that surround the work (but which program its reading in very constrained ways), is a false problem, since it relies upon an anachronistic approach of these models and metaphors. It is not fair, one would say then, to question the importance given to Barthes "pleasure" and to Surrealist games, given the fact that in the early 80s these two models functioned in a completely different way (at that time, both textual pleasure and exquisite corpses were convenient, useful, appropriate models and metaphors). Yet for two reasons, this objection does not hold. First of all, the reading of a Roy Ascott work must take into consideration the fact that things change over time, and that it would be absurd to stick to readings of the past which achieve a kind of supratemporal status. Such a stance is simply contradictory with everything Ascott is thinking and what his work stands for. Second, and even more importantly, Roy Ascott as well as Roy Ascott scholars are highly aware of the ambivalent status of the metaphorical tools one uses while elaborating new forms of thinking. On the one hand, it is impossible to do without, for these metaphors are not merely "ornamental" of human thought, instead they make human thought and innovation possible. On the other hand, each metaphor or model has also its limitations, and one has always to remain suspect of them and take care of not taking them too literally. In that sense, our current reflections on the double model of textual pleasure and automatic writing is very similar to Edward A. Shanken's meticulous rereading of the twofold model of the *noosphere* (the model of expanded consciousness, borrowed from Teilhard de Chardin) and the *global brain* (Peter Russel's elaboration of that same idea). These models have been key to Ascott's own thinking on interactivity and connectivity, yet as Shanken rightly argues, it is important to maintain a critical distance towards these (necessary) speculations (Shanken 2003: 4-5).

Reading as a form of "screen-thinking"

Looking for new reading models is therefore necessary, but should not be seen as an aim in itself. Therefore, it is important to know which kind of features one wants to highlight. In the case of *La Plissure du texte*, it might be interesting to further reflect on two basic characteristics of contemporary writing that have undoubtedly been enhanced and accelerated by Roy Ascott's work: spatialization and digitization. The modern literary text is a spatialized text, not in the sense that its material presentation accentuates visual parameters (typography, lay-out, illustrations, etc.), but in the sense that its very writing and reading are producing new experiences of space. One may think here of Stéphane Mallarmé's groundbreaking poem *Un coup de dés* ("A Throw of the Dice", 1897), whose visual pattern, which it is not possible to start analyzing here (Cohn 1949), offers an experience of a process in which nothing is taking place, except place itself. Spatialization, which in the case of Mallarmé has also to do with the abolition of old forms of authorship and the introduction of chance operations, is more and more linked today with computerization. Literature is becoming more and more digital born (Hayles 2008), yet many consequences of the shift from page to screen have still to be discovered.

It seems plausible, however, that works such as *La Plissure du texte* (and even more LPDT2) should be paramount in our reflection on all these aspects, provided we can use or elaborate new tools that help makes sense of their novelty. An interesting candidate in this regard may be Anne-Marie Christin's notion of "screen-thinking", as defended in numerous publications on the history of writing as a profoundly visual system, and whose usefulness for spatialized and computerized writing is very promising.

Christin's notion of screen is much broader than the technical sense of computer screen. It involves both a material and a cognitive aspect. Materially speaking, it implies that the meaning of a text is not (only) determined by the meaning of its linearly and hierarchically organized units, but (also) by the metonymic relationships that are being established within a certain frame or screen. Cognitively speaking, it implies that the production of meaning has not only to do with the recognition of already meaningful units but also with the contemplative and meditative creation of new meanings within the energized field of the screen. And just as in the case of Mallarmé, this new vision of the text involves also a new vision of authorship and text. It is the viewer who makes the text, and this text is an open network of relationships within a given frame.

Christin's screen-thinking is obviously compatible with Ascot's work. First, it strongly emphasizes the link between art and technology. The screen is indeed a device, not one that is mechanically imposed, but one that is creatively activated according to permanently shifting contexts. Second, screen-thinking appears also as a form of participation, for interpretation is much more than the identification of already given elements. Third, the agents involved in this whole process are clearly supra-individual. Even in the case of a solitary meditation of the textual object or the writing process, there is a strong awareness of the mutual implication of subject and object: I am shaped by what is being shaped by me, in an eternal movement of mutual enrichment and questioning. For all these reasons, and given the highly productive and stimulating character of Christin's work in the field of literary and visual scholarship, it may be highly

relevant to try to implement screen-thinking in our reading of *La Plissure du texte*. Of course, screen-thinking may prove in the (near?) future as problematic as the reliance upon Barthesian pleasure and Surrealist automatic writing, but in the meantime it can only enrich the already existing network around Ascott's work, which it helps connect with the key issues of LPT2: textual mobility, distributed authorship, emergent semiosis, multiple identity, and participatory poesis.

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DEEP/PLACE: SITE-BASED IMMERSIVE HISTORY

Bridget Baird, Özgür Izmirli & Andrea Wollensak

DEEP/PLACE is a flexible system for site-based, immersive, interactive installations that allows participants to explore historical and cultural information in a hybrid physical/virtual space. This multidisciplinary collaborative artwork merges materials from discrete domains; navigation is through an intuitive gestural interface. The experience provides an interplay between the real and the virtual, allowing the past to infuse the present.

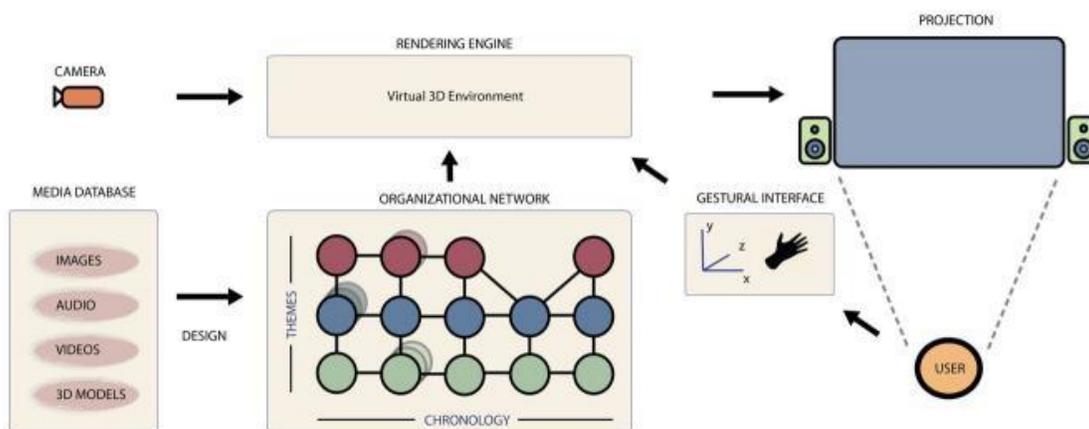


Fig 1. Overview of the DEEP/PLACE system.

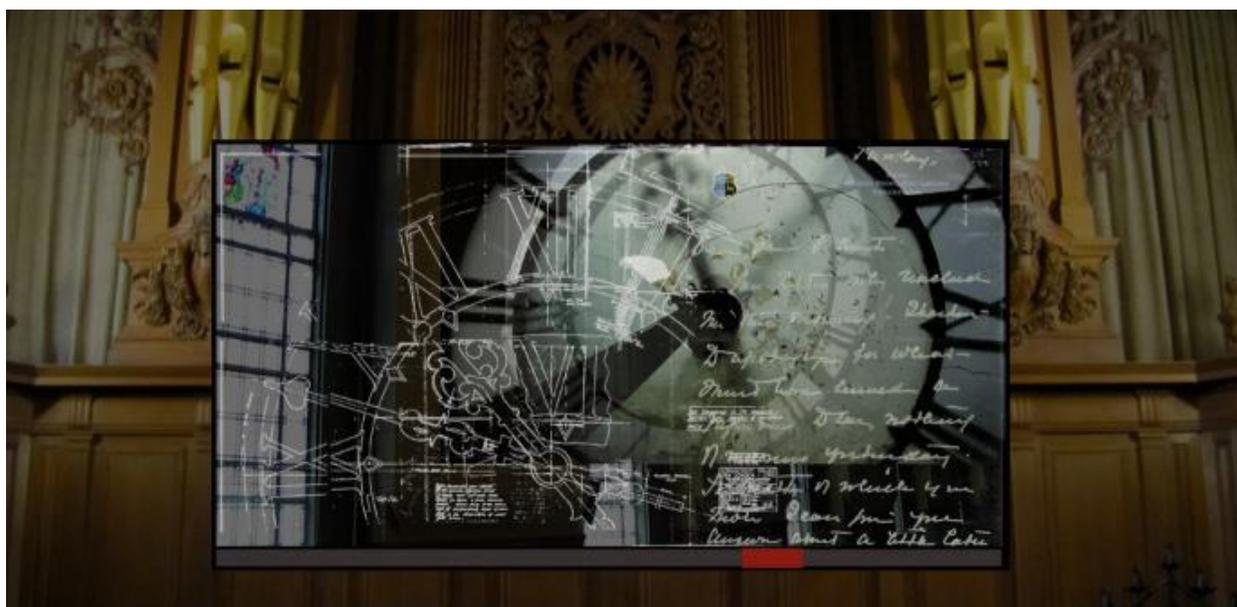


Fig 2. DEEP/PLACE system installation in Harkness Chapel.

Introduction

We have joined together as an interdisciplinary team of collaborators to explore, through technology, experiences of place and history that are engaging and interactive. As part of this endeavor, we began with a set of core guiding principles that would govern our investigations. The first principle is the experience of a hybrid physical and virtual space in which to situate site-specific enriching information such as socio-cultural and historical artifacts and audiovisual elements. In other words, we began with the premise that we would curate a wealth of site-specific information about a selected place, and that the end user would engage with the material not solely through a computer, but rather, by way of a digitally enhanced and augmented experience in the place itself. The second principle is that we would develop a customizable system that can be configured and deployed to different sites with the ability to define semantic categories to organize the curated media content. The third principle is that the user interface will be as simple and intuitive as possible in order to promote the users' engagement and provide a relatively transparent mode of interaction. The fourth and final principle is that the information architecture of the system will be non-linear and contextual so that the user of the system can navigate through the site-specific information by means of gestures within the space.

DEEP/PLACE features an expanded interactive audiovisual space consisting of diverse media elements. This multidisciplinary collaborative artwork merges materials from discrete domains—such as architecture, cultural geography and geology—in an immersive site-specific experience. Participants explore the multifaceted information by navigating a rich media landscape through an intuitive gestural interface. The media landscape is represented by a system of interconnected nodes of site-based information that include spatial and geological information, archival blueprints and images, 3D models, video and recorded audio material. A live camera feed of the site into the virtual space connects the built architectural space to the digital multi-modal history. The overall experience provides an important interplay between the real site and the virtual experience, allowing the past to infuse the present.

System Description

The DEEP/PLACE system is a flexible and customizable environment that will allow others to design their own site-based interactive explorations, populated with relevant media. The underlying structure provides coherence and ease of use while allowing the designer great freedom to individualize the experience for the particular site. The user communicates with the computer application through a gestural interface that consists of a wireless multi-sensor glove and position trackers. It implements a 3D virtual environment in which the rendition of the media elements within this space are projected onto a large screen and played through loudspeakers.

The process for a typical deployment of the system includes an archival research phase followed by digitization, recording and modeling of artifacts. In the next phase the designer organizes these media elements into thematic and chronological clusters called nodes. The final stage of the design involves the organization of media elements within the nodes, which are 3D subspaces in the virtual environment. Once the design phase is completed the system is placed at the chosen site in a location that best underscores the dual experience, that is, the interplay between the presence of being at the real site and the

virtual experience. The visuals are rendered in real time and projected onto a screen that is located directly in front of the participant; the size of the screen and the location of the participant are chosen to balance the immersive aspect of the rendered content with the presence of the immediate surroundings of the site.

In Figure 1 we provide a schematic overview of the system. The media database contains assets collected during the research phase. The organizational network represents the overall design of the content and includes information about all media elements. The rendering engine implements the virtual environment by combining information from the organizational network, digital assets, the gestural interface and the on-site camera to produce the visual and auditory output.

The main organizational construct in the system is the *node*. Conceptually, each node represents a theme and a chronological moment in the history of the site. Each node may include multiple media objects: possible media formats include images, audio (either spatialized or ambient), recorded video and 3D models. Within the virtual space, each node occupies a defined volume. Each piece of nodal media, as appropriate, can be positioned and sized within this volume, as specified by the designer via a text file, creating a visually dynamic layered information space. The design can specify a variety of properties for each media object in the virtual space such as: theme, chronological period, type (image, audio, etc.), location and size.

Within the organizational network, nodes are linked conceptually in two manners: chronologically and thematically. The designer determines the thematic subjects and the temporal divisions based on how s/he wishes to organize and aggregate the elements in the media database. If one thinks of the themes and chronological divisions as a two-dimensional planar grid, the nodes are objects in this grid which, in turn, contain multiple media objects. In other words, each node represents both a theme and a moment in time. The system is designed so that all nodes do not have to be populated on this grid. The designer also has the ability to designate multiple nodes that depict a theme and the same chronological division. In this case, when the user arrives at a node, one of the possible nodes will be randomly chosen by the system.

In addition to designating the nodes, the designer can also choose background images and colors that correspond to themes. There is also the ability to import filtered and manipulated video from the live camera feed. The system is structured so that, once the designer has prepared the media and conceptualized the organization of nodes, it is straightforward to implement.

User Experience

As a system focused on realizing site-specific installations, the *DEEP/PLACE* system is portable and can be set up in any site location. The main components include the interactive system (with a gestural recognition glove and position trackers for the user's hand), video projection, stereophonic audio and an on-site video camera. The user learns to make a number of navigational and exploratory gestures with the glove and attached trackers, moving through historical time and across the chosen themes for the site. The user explores the rich media landscape by navigating within and between nodes. Exploration within the node involves moving the viewpoint to a position and proximity of a media object. Object-specific audio is spatially triggered during this exploration. In contrast to node-specific ambient audio, object-specific audio may be heard based on the user's proximity to the objects that have attached

audio elements. During the exploration a live camera feed that has been filtered contributes additional media.

The experience opens with a node that contains media (video, image, audio) elements within a volume of space. The user can navigate through this volume (through gestures) and examine the media more closely. When the user has finished with the current node, a change of gesture (using finger pointing) will cause the user to navigate to a different node: a gesture in the horizontal direction will cause the user to move backward or forward in time (the movement will be either left or right) and the same gesture moving away or toward the user will cause the theme to change. As the user navigates to a new node the old node will fade and move away as the new node, populated by its media, comes into view.

The gestural interface consists of a wireless glove and 3D position sensors. Gestural movements allow the user to explore the media within a node. Gestural movements also allow the user to travel to the nearest adjacent nodes, either chronologically (the theme will stay the same but the user will move forward or backward in time) or thematically (the user will stay in the same time period but change themes). Other gestural movements also help orient the user by returning to an initial view of the current node or moving back to the system's starting node. A timeline at the bottom of the screen helps orient the user chronologically; background images and color orient the user thematically.

First Realization of the DEEP/PLACE System

For its initial deployment and configuration, we authored the *DEEP/PLACE* system to focus on Harkness Chapel (Connecticut College, New London, USA) with three main themes: architecture, culture and land. Harkness Chapel is a landmark building on the Connecticut College campus that was designed and built in 1938 as a reflective gathering place. As a public site, it has a rich history of performances and events. Much of the materials we have found on the architecture of the building are in the form of letters, architectural pencil drawings, and some black and white photographs. Current material within the architecture theme include video and audio and a virtual tour of the interior public and crawl spaces and the bell and its tower. Archival materials for the architectural theme include schematic drawings and photographs of the construction of the chapel. We have included in the culture theme a large collection of letters, telegrams, and notes from meetings during the time of construction between the architect, Roger Gamble and the donor, Mary Harkness, in 1938. There are also many time-based audio and video clips of performances. The geology (land) materials include GIS (Geographical Information System) data of land use, historical maps and information about the geological rock formations. We have produced layers of 2D images and 3D models that show the site within a larger land mass. This context includes both the surrounding area and also a visualization of what is under the surface of the earth in this location.

We have elected to position the screen in front of the altar in the chapel. This choice allows the main architectural elements of the chapel (windows, ceiling, organ, beams, arches, organ grille) to be visible to the participant in addition to the panorama of the screen (see Figure 2). The background visuals of the virtual space are informed by the images obtained from the on-site camera. The wireless camera is positioned inside the chapel so that the changing light conditions are captured and used as part of the digital background in order to accentuate the quality of light coming through the windows throughout the day. This connection portrays the interplay between the actual site and the virtual one. We have also used color codes to signify our themes (architecture, culture, land) to provide thematic orientation to the participant.

Conclusion

DEEP/PLACE is a flexible site-based interactive installation that can be configured to allow participants to explore site-specific historical and cultural information in a hybrid physical/virtual space, creating new opportunities to enhance apprehensions and relations of place. We have created the first iteration of this system by designing an explorable topography of site-specific historical/archival, geological, architectural and audiovisual elements based on Harkness Chapel in New London, CT, USA. This collaborative project involves three core faculty (in Studio Art and Computer Science) at Connecticut College as well as students within the Ammerman Center for Arts & Technology. Expertise in history, architecture, geology and geographical information systems was provided by affiliated faculty at Connecticut College.

Acknowledgement

The authors would like to acknowledge the invaluable assistance of two Connecticut College students, Amy Barrett and Hannah Plishtin. Amy worked on the gestural interface and Hannah worked on the archival material. Both students assisted in the design development.

TACTILE VIDEO LOVE LETTERS: FINDING NEW MODALITIES FOR NON-VERBAL COMMUNICATION

CAMILLE BAKER

This paper will discuss new research repurposing the mobile phone from a textual and voice device to a more multi-modal, synaesthetic, tactile, expressive, and gestural device. 'Tactile Video Love Letters' seeks new modes for individuals to express themselves intimately, visually and non-verbally—akin to remote 'touch', immediately and intuitively understood in a pre-conscious sense—direct and tactile route to interpersonal communication.

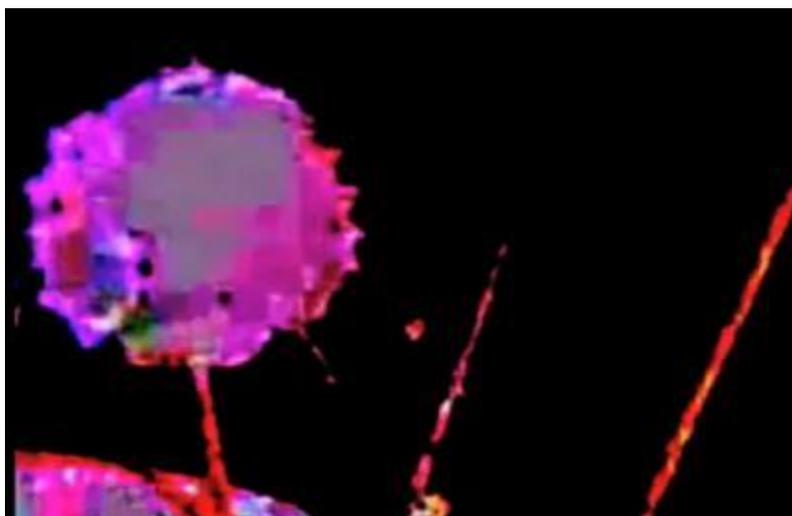


Image 1. © 2010 C. Baker – screenshot from MINDtouch project mixed video



Image 2. © 2007 C. Baker – still image by participants part of MINDtouch PhD research workshops

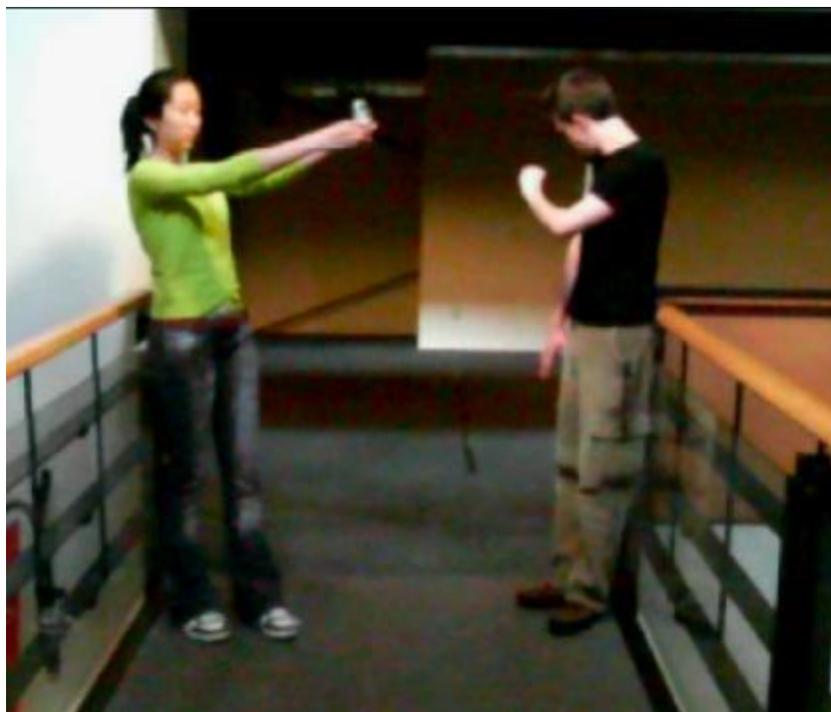


Image 3. © 2007 C. Baker – still image of participants in a MINDtouch mobile video workshop

ABSTRACT

This paper will discuss new research that repurposes the mobile phone moving it from a textual and voice device to a more multi-modal, synaesthetic, tactile, expressive, and gestural device. The project ‘Tactile Video Love Letters’ seeks to find new ways for individuals to express themselves, in an intimate, visual and non-verbal way—akin to sending remote ‘touch’ messages, immediately and intuitively understood in a pre-conscious sense—direct and tactile route to interpersonal communication.

CONCEPTUAL APPROACH

Currently, we live in a world where we are increasingly more distant from our friends and families. Mobile video cameras can be repurposed to visually convey emotions and sensations, rather than merely a device for documentation of events, or as an entertainment gadget. As such, this new project ‘Tactile Video Love Letters’, aims to continue to bridge this emotional and physical divide between users.

Based on previous neurological research on human development [\[1\]](#), it is evident that humans *need* in-person, physical contact (as do all mammals) and interaction to establish and maintain intimate bonds, as well as to continue to develop strong neural pathways in the brain. According to psychiatrist neuroscientists Lewis et al (2001), this physical contact is essential for survival (and the only authentic, tangible, focused interaction). Therefore, communicating via written word, voice etc. is only part of this interaction.

Portable devices and increasingly ubiquitous forms of mobile media and communication devices have transformed the modalities in which we can communicate our affective and emotional “states,” however they are still predominantly via text and language. Mobile images are often experienced as personal, intimate, and private expression. Once sent, the immediacy of these media images feels like a receiving a virtual kiss blown to you or of invisible pieces of them [\[\[ii\]\]](#) through the network. Therefore, if one thinks of a text message as a thought transfer, then an image or video is sensory or sight transfer, sending visual experiences, feelings, as well as one’s unique expression and perspective. Thus, people might wish to send their internal perceptions, instead of relying solely on words to communicate when using the mobile phone.

Tactile Video Love Letters’ involves developing a novel method to repurpose the mobile videophone, using wearable technologies and smart textiles. This fresh approach hopes to replicate physical experience as much as possible. The system will use both the mobile connection using a wearable interface for tactile interaction. This will create a reciprocal exchange with a way to reply to a mobile message sender in a non-verbal, embodied, multi-sensory, two-way dialogue. Thus, this media project studies to relay ‘felt’ experience or touch sensation ways through a sensitive interface that is a skin-like membrane or bio-material responds with a reply directly to the recipient’s mobile phone application.

To address the problem of extended absences, global travel, and distance relationships, methods will be developed to enable the translation of emotional content contained in the visual construction and patterns of mobile video messages into ‘touch’ messages. Visual interpretation software technology will be designed to transform and transmit the video messages recorded by mobile videophones into physical feedback and sensations. These emotional video messages will then be sent through to the tactile textile/membrane’s interface to pass the message to the person directly through the surface of their skin, by contracting, emitting heat, pulses or vibration and other such actuation outputs. Also under investigation are methods to relay the ‘felt experience’ or touch sensation back through to sensors, via the garment, to send a reply or notification response directly from the garment to the initial sender’s mobile phone. This is intended to better enable a person to have more realistic ‘contact’ or interaction with a friend or family member at a distance.

CuteCircuit designed the first mobile connected sensory wearable garment with their HugShirt© in 2006. Others have since followed from their lead, with variations of mobile-to-garment projects. Tactile Video Love Letters builds on the innovation of CuteCircuit’s ground-breaking, interactive garment, the HugShirt© [\[\[i\]\]](#). It aims for a two-way exchange and experience, with sensitive textiles, and mobile video, taking this interchange to a more complex level, with mobile connection to skin interaction. To achieve these aims involves a systematic approach in three key areas: video messaging lexicon development, sensor/textile interface design and mobile media application programming and development.

Tactile Video Love Letters asks users to draw upon the visual material in their environment and any imagery they think relevant or essential to their expression. The ‘tactile textile to video’ exploration will develop a customised video symbolic vocabulary or lexicon to express and construct visual ‘sentences’ or ‘utterances’, to then be translated into distance touch or embrace. The intention is to create a structured semiotic system for expression, especially for people with physical, verbal or linguistic challenges, to use for personal interaction and to have an embodied, tactile and visual means of messaging [\[\[ii\]\]](#).

Through a participatory design processes project will develop a method to use videophones and mobile imagery together as an alternative to the current textual or voice uses. It will utilise visual patterns and common approaches to the use of visual material in one’s environment, including users’ movement and

gestures with the device. As the sensory experience/conceptual/interaction designer and facilitator, my role is to explore the physiological tactile experiences of emotion on the body and brain of the message receiver, as well as to develop (with the aid of the users) the video language used by the video message senders [[iii]].

The first step for this 'tactile video' research, is the development of a symbolic video message lexicon to express with. This involves:

- 1) exploiting the possibilities and limitations of the mobile device and its video technology;
- 2) studying users' comfort with the device;
- 3) understanding the limitations of available environmental visual material as an aid in communicating such messages;
- 4) testing/studying users' ability to utilise the visual environmental material to represent their emotions, internal perceptions, sensations, or experiences;
- 5) studying visual content, meaning, patterns and representations to create a mapping of symbolic vocabulary to translate into touch sensations;
- 6) create structured activities for test users to be guided through, in order to find ways to express or record patterns and other visual elements as meaningful messages.

From this process, a vocabulary or syntax of representations of internal experience should emerge.

User interaction workshops for this process will be conducted starting before the end of 2011. This will begin with a designed set of structured improvisation activities to explore various types of expression as the impetus for developing a symbolic code for non-linguistic video expression. These workshops will be based on previous PhD research (Baker, 2010), where it was observed that the key aspects of mobile video-making process include these four features:

1. an innate performativity, movement, gestural qualities, afforded by the device size and its features;
2. portability factors (i.e. ability to watch or shoot anywhere), which allow one to notice the mundane more acutely, and causing people capture all that catches their eyes;
3. the phenomena that users start to view the world through the camera 'vision' of the mobile screen, rather than their eyes alone, adding novelty, and a re-engagement with the scenery;
4. an innate intimacy of expressivity, fostered by ready access to the device, and the predilection of users to record close-ups – framing only that which is to be seen, allowing for abstraction.

In previous user recording workshops, users were observed capturing their experiences and exploring the immediate space of their bodies, as the main intrigue and focus of the mobile medium. This has become a common approach to mobile video capture, as other artists and researchers have found [[iv]]. It was found that the device inherently encourages movement, often resulting in a smearing effect making

abstracted patterns through gesture. This instinctive approach to mobile video recording is facilitated or afforded by the device size itself (possibly not intended by the manufacturers). Thus, it appears that users' immediate impulse is to wave the device around, as if it was part of their hand, blurring the images intentionally to experiment with the visual results. To exemplify the gestural and intimate aspects of mobile recording practice, artist Dean Terry states that the phone encourages one:

*[...] to project [the] **very private space immediately surrounding the body** into meta-space. Many of the videos show objects little more than a few centimetres beyond the tiny lens, often some body part, like hands or forearms that obscure an unknown, overexposed background space. Other pieces are **gestural performances**, recording the movements required when following a line, or when trying to create shapes by moving the camera in certain ways (2005, my emphasis).*

One can only conclude that the videophone inspires a playful, gestural, or performative exploration resulting in a new video aesthetic unfolding merely of the qualities of the device.

A new modality for non-verbal communication

The primary dimension of this new project is in determining what non-verbal, visual communication can result when users are asked to express a certain types of inner experiences or perceptions using videophones. The aim is to harness users' own ingenious nuances of representing their inner sensations and emotions through the imagery. Thus, the focus of my work has shifted from facilitating non-verbal, internal, visual and synesthetic expression.

Non-verbal communication generally involves using eye-contact, gestures, body language, touch, tone of voice, and other physical indicators, to express certain information to others without words **[[v]]**. It can also be used to highlight a conversational or linguistic exchange, or to make a point more clear. Sometimes it is a mode of communicating the unspeakable or a way to interact prior to formal verbal exchanges or introductions being made. It is a means of initiating contact, or expressing something intimately without the need to verbalise the sentiment. We all use non-verbal modes of expression and learn them at a very young age, possibly before we are able to speak.

In his research on mobile phone use, Murtagh noticed that non-verbal behaviour:

[...] focus[es] on bodily gesture and eye contact emerged from the data when it was noticed that activities with and responses to mobile phone use were almost invariably non-vocal in nature [...] Yet, so much of mobile phone use in public is organised through non-verbal action and interaction. It is suggested that these non-verbal aspects of phone use display the 'unwritten rules' of usage behavior in public. (2001: 82)

In my previous research, participants were asked to use videophone imagery to speak for them, to draw upon visual material within their immediate environment, as well as from their own sensations, perceptions, thoughts, and emotions, to share with others without words. Through gestures and movement it was evident they could represent their internal experiences via the external world visually and could have meaningful non-verbal expression. This modality falls outside of the usual physical or body language and is more akin to the cinematic language **[[vi]]** of video art, abstract cinema, audio/visual performance. This method of non-verbal expression does not require in-person presence, but could be transmitted in a visually with a mobile connection. This digital mode of remote non-verbal expression

transmits different layer of emotional presence, beyond tone of voice or turn of phrase that is currently used. The embodied interaction through technology replaces the in-person physicality.

Also to be investigated here, is how a receiver of video messages might experience and interpret these messages, especially if the messages are abstract, emotional and visceral. A direct, literal approach to constructing the visual expression may be the key to meaningful exchange (or may not be). Thus, one option is to construct a semantic language or symbolic representation for video messaging. While it can be argued that, like a dream or an artwork – the receiver/viewer/dreamer should also be free to interpret the message any way they like, in some cases the representative imagery is clear enough in content that the message is evident and obvious [[vii]]. Yet, the way the communicator constructs the message can also help in its interpretation and how it is decoded, especially if they use recognisable signifiers and symbolism (see Image 2 below). As such, this research will develop activities to develop a visual lexicon, building on past research that can provide tools and a structure to guide users to create a video language of their own. The intention is to develop a coding system for direct personal, embodied, sensual, and meaningful visual messaging using synaesthetic possibilities of mobile expression. The goal is to enable the average, non-artistic user to communicate in playful, creative, intimate, and novel ways [[viii]].

CONCLUSIONS

This project hopes to help people to maintain close personal bonds when it is difficult to be physically present or infrequent. Yet, most people likely do not seek a digital replacement for in-person contact with the spouses/partners, friends, family, or business associates. Ultimately, fleshy, corporeal, in-person interaction will always be the most sought-after and ‘real’ experience. We have evolved to a condition in which this the optimal form of clear human understanding, trust, survival, and connection between people. Global travel for business, pleasure, and trade necessitates that we develop better solutions to bridge the gaps between face-to-face interaction and immediacy to maintain relationship. The only reasonable justification for substituting fully embodied experiences of in-person interaction are to save money, resources, lives, and other life threatening activities that otherwise cause problems in our current socio-economic, political, and environmental state of the world. Instead of using 3D surround projection TV to bring us closer to a sense of real, live, in-person experience with others, this project seeks a more sensual, tactile, present, and cross-sensory approach.

Artists and scientists will continue to develop alternatives to in-person contact, ones that feel real and authentic, both emotionally and physically. This media art research will expand on previous work by continuing to seek new interpretations of everyday technology, to improve the quality of life through non-verbally express and transfer messages through various embodied modalities. As always, my overall goal is to devise deeply experiential interactions, in order to improve and expand communication options and traverse vast distances through creative, multi-sensory modalities.

This project is only beginning so all suggestions are welcome.

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NANOART- SCIENCE AND MAGIC

ANNA BARROS

In the nano world the transmutation of elements by manipulation of its molecules, the superstar of nanotechnology, introduces an almost magical connotation. The condition of invisibility and the presentation of its images provided by the electron microscopes increase the sense of touch to the first magnitude. This text discuss ways that have been updating Nanoart. The emphasis is on the presentation of works and research by the author.

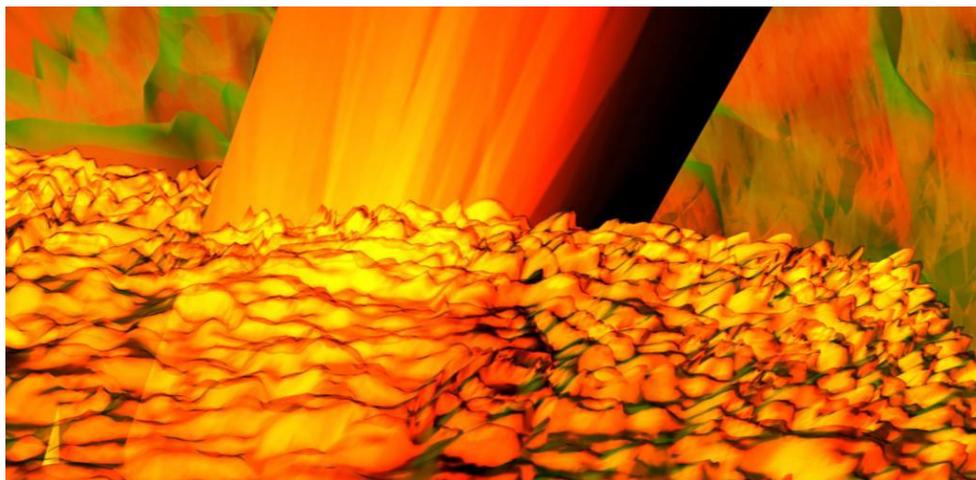


Fig 1. 200 Million Years - *Durée*, 2010, Anna Barros. Still frame of digital animation.

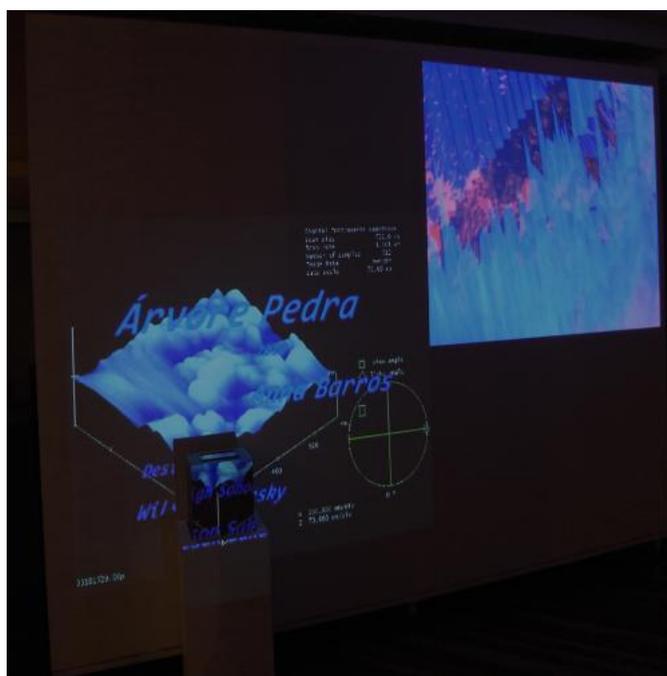


Fig 2. Petrified Tree, 2010, installation, Anna Barros. Photo Carlos Donaduzzi.

The integrated circuits and optoelectronic devices that enabled the first steps on the path of nanoscience and nanotechnology – molecular technology – were invented in the last century, in the 1960's. Art and science together aimed at researching and presenting nanometric particles (a nm designates a billionth fraction of a meter), which are placed beyond human perception, in a horizon where the material and the immaterial are perambulating a space dominated by quantum functions, under a never experienced behavioral way. With this, a hybrid discipline was created, where two knowledge categories start to be experienced in mutual transformation, able to amplify the perceptive qualities of humans.

The techniques that opened up the mysteries of nanoscience may be classified in the general category of Scanning Probe Microscopy. The Scanning Tunneling Microscope have a tiny tip made of conducting material with one or a few atoms at the top, controlled by a mechanical arm that executes a tridimensional movement scanning the sample. The laws of quantum mechanics permit the electrons to move (tunnel) between the tip and the sample. The images are in 3D and have a virtual character, what you see on the screen is their transcoding by a computer program. The same for the Atomic Force Microscope images.

The domination of seeing was altered by the entry of these three-dimensional topographic images, closer to tactile sense. The existential condition of nanoscience lies between matter and energy, a world unseen but felt, here it is possible to blur the boundaries of mind, and dream of the creation of new materials, even artificial life, throughout a new disposition of the atoms organization.

A new world is the dream of all creators; in nanoscience this is taken to a higher level raised by the possibility of the human being to recreate himself, which can be a marvel or a damnation. At the nanoscale, matter has different properties. A new cultural paradigm is formed by the convergence of several disciplines: nanotechnology, biotechnology and biomedicine, information technology, cognitive science, together under the acronym NBIC that refers to nano-bio-info-cogno.

These conditions generate a feeling of magic, of presence of an occult science, a source of power beyond that provided by the perceptive experience, already settled in knowledge and recorded by culture.

SCIENCE AND MAGIC, SCIENCE FICTION

The importance of science fiction in the course of researches in nanotechnology strengthens this enchantment, while science still searches for a narrative to describe what happens in this world by the difficulty to understand its properties. The science fiction narrative is more intuitive and fantastic, contributing for an opening to new scientific perceptions.

In literature, Suzan Lewak presents nanotechnology and nanoscience focusing on an analysis between her enchantment and that found in *Alice in Wonderland*, by Lewis Carroll. She shows Alice's journey as a useful metaphor to nanotechnology, which "is a magic that is predicted to become a valid part of human experience." [1]

In Carroll's book, it is not the tiny scale of the environment where the story takes place that enchants, but the enchantment presented and validated by itself. The child's imagination is set free, with no moral messages. What Alice must realize to experience this new world is that "there is a 'logic' to Wonderland,

she must... learn to accept Wonderland's microscale logic as a separate entity which operates according to its own set of principles." [2]

In a similar way, we realize as magical the properties and the matter behavior in nanoscience, but they are ruled by the laws of quantum mechanics. Used to perceive the world as a set of things, more or less solid, how do we react to this set of molecules swirling in a frenetic dance of electrons?

THE SENSES AND THE POETIC IMAGINATION

Let's bring back the question of the predominance of sensing over seeing in the nanoscience and nanoart world. William J. T. Mitchell claims the nonexistence of a sense, in a pure state, as to the specificity of media to organize them: "there are no visual media." [3]

Since the avant-garde movements, art seeks the integration of all senses: in nanoart, this has to start from scratch because one can not physically touch the matter; there lies a perceptive ambivalence, between the microscope and human.

In the mean while seems to be a clear consensus about the classification of first-order senses: sight and hearing have been dominating our occidental culture and art. Some current thinkers as Roy Ascott, in digital art, and Madalina Diaconu, in aesthetics, follow this classification.

Diaconu says that touch would be among the secondary senses – touch, smell and taste (according to phenomenologists), which in principle could not produce art because "they deal with ephemeral stimuli and consume their objects." [4] Diaconu gives careful considerations to the exceptions in arts that are transitory, such as dance, theater and music, where the touch prevails, to what we add digital animations.

The properties of digital animations are introduced at the beginning of the new Technologies of Communication when Mario Costa places the Aesthetics of Communication in Cyberculture as an aesthetics of events that are not reduced to a form; they present themselves as a space-time flow, an interactive living process. They are a mobilization of the energy that replaces form and object.

This energy mobilization in digital art is updated by bits, in nano, is present in atoms and molecules allowing us to speak of a quantum event.

Roy Ascott identifies "digital, somatic, and pharmaceutical" [5] as second-order senses. Within the first order, he includes further senses according to neuroscience: "pain, balance, proprioception, kinesthesia, sense of time and of temperature", similarly so with the ranking of secondary perceptive senses by Diaconu.

Ascott identifies four forms of sensibility, among which we travel freely in our current experience: physical presence in ecospace, apparitional presence in spiritual space, the telepresence in cyberspace and the vibrational presence in nanospace", what makes us return to the domination of the tactile and haptic system in nanoscience and technology.

The philosopher Gaston Bachelard assumes the universe of imagination and poetry where senses are never seen as isolated or working separately. According to Bachelard the poetic image does not germinate from a perception of the senses, but comes from a “poetic reverie as a phenomenology of the soul.” [6] This classification echoes in Ascott’s “second order senses. Technoetic senses.” [7]

ART BEING GENERATED IN NANOART

The presence of atoms and molecules energy, decoded in images, is something quite new to us, artists, and the way we display it in artworks is still in its earliest stage.

Having no history, it asserts itself by the search of artistic techniques for its own achievement and, at the same time, aims at breaking them. If Art History depicts the struggle of artists to destroy parameters and evolve in the interstices of accepted knowledge, nano art performs in a space without boundaries, where the constitution of the artwork-subject conflicts with the continuous flow of energy, in a cosmic dance of molecules, which becomes visible in this field where the real and the virtual, the potential and the actual still flirt, things that we are just starting to perceive. To us, artists, it offers the opportunity to penetrate our creative interiority, a magical space where the act of creating explores the possibility to experience wonder for wonder, and deliver it to the community in a new perception.

Among the means used to creating in nanoart, we define:

First - The use of images generated by research lab microscopes, on which artist and scientist work together. Several artistic techniques are used. Cris Orfescu was the first artist to create a group to work under these conditions: NanoArt 21.

Second - Artworks that use a metaphor to translate the perceptive conditions themselves into a nano environment. Some outstanding artists: Christa Sommerer and Laurent Mignonneau, and Victoria Vesna who worked together with scientist James Gimzewski.

Christa Sommerer and Laurent Mignonneau, *Nano-Scape*, 2003, is an artwork with little visual information, where the sensing perception prevails. According to the artist, it is an invisible sculpture, like the nano world. She wants to reach this world throughout intuition; she uses a wireless magnetic force interface so that the visitor can create an invisible sculpture by touching with a ring, a table prepared to this experience.

Victoria Vesna’s and James Gimzewski lead us to the experimentation of philosophy issues on the impact of this emerging science over culture in general, in interactive installations.

Maybe Blue Morph is the most paradigmatic artwork of these two; it uses images and sounds obtained by an Atomic Force Microscope from different phases of the metamorphosis of a caterpillar into a blue butterfly in a sound process called sonocytology. The poetics of the artwork is built to generate a poetic and mysterious environment where the scientific information is invested with a sense of magic.

There is the suggestion to transform the visitor and here Vesna meets Ascott’s ambition of a codependency between the observer and the observed object in “technoetic systems (digital, somatic, pharmaceutical) designed to enable us to traverse further states of consciousness, to access psychic states, and extend our spiritual awareness.” [8]

200 MILLION YEARS - DURÉE, 2010

As an active artist, my research is always combining theory and creative practice and ponder over it. This installation is part of a trilogy: *200 Million years – Petrified tree*, 2010, *200 Million years - DURÉE*, 2010 and *DURÉE*, 2011. For its accomplishment, I faced lacunas in the traditional art education, where there is no priority development of the sensorial systems, tactile and haptic; I sought for perceptive experiences arising from body contact, during my training in Laban movement for enhancing my sensibility; in the extension of conscious while penetrating the unconsciousness, in active imaginations in Jungian analysis, where the boundaries of reality are broken similarly to the experience in nanotechnology and nanoscience.

In *Petrified Tree*, only the imaginary information of the petrified tree was activated. For the first animations, images derived from the Scanning Tunneling Microscope were used, seeking to give movement to geometric forms suggested by those images. There are archetypal forms found in drawings since the beginning of time, and also in nature formations: in the Ypê tree bark images, an hexagon; in the petrified tree, a sphere. A dominant color to each instance was assigned to those images.

The installation has a little box, with mirrored sides, containing a digital picture frame that displays images of the first JPG animations, combining in sequence the sound created by Wilson Sukorski, a musician and special sounds and instruments inventor who has helped me in my research. By the side of the box, in a large scale, two animations are projected: one is the same in the box, in which the viewer is also included; and next to it, another one in 3D displaying poetic images scanned by the Scanning Tunneling Microscope.

The project for the installation *200 Million years - DURÉE* was presented at FILE 2010, São Paulo; 9^o International Meeting of Art and Technology, UnB Brasília, 2010 and the art work exhibited at the international exhibition EmMeio#2, in the National Museum of the Republic, Brasília, November 2010. It features a digital animation and a vibrating chair. Sound was created by Sukorski and is presented in a hybrid form with the image in order to emphasize the tactile and haptic perception, generating a vibration that is felt by the body.

The scientific images derive from samples of a petrified tree that grew 200 million years ago in a paleontological reserve of Mata, in Rio Grande do Sul; seeds of Ypê and Reseda trees; a branch of a Reseda tree and the bark of an Ypê tree scanned by the Scanning Electron Microscope and the Scanning Force Microscope (Instituto de Física da Universidade de São Paulo, São Carlos; Laboratório de Filmes Finos, Instituto de Física, Universidade de São Paulo, São Paulo; Centro de Nanociência e Nanobiotecnologia, Universidade de Brasília).

Animations of poetic nature were created from these topographic images in 3D computer programs. The still images generated by the computer program connected with the microscope are in tiff format, and even if they are seen in the third dimension with topographic quality, they do not show the necessary technical characteristics to create 3D animations. An independent object that can be animated is required. To this purpose, I worked with the program, Blender, in order to obtain a bitmap of the image, which was then transferred in sequence to 3D format, where I created the animations.

While science and media try to capture images from these tiny particles to understand their properties, DURÉE tries to make them accessible, poetically and intuitively, according to the felicitous space of Bachelard, a space that "... has been lived with all the partiality of the imagination." [9]

My digital animations, despite being usually abstract, have their origin in tales and mythologies, as seen in Saci, Tiamati, Mahamaha. This magical atmosphere beyond the daily reality, was activated in the poetic narrative of DURÉE, where 200 million years are placed in that same quantum of the nano scale.

THE CREATIVE PROCESS

My body is connected to the universe through nature in a growing complexity; in a process of bottom-up as scientists call the path that arise from the possibility to rearrange one by one the molecules position. Not only the biological body, but my whole being.

While walking in a nanoart installation, we carry the experimental and conceptual burden of culture, and we have to acquire new perceptive experiences to fully enjoy the experience in nanotechnology and nanoscience.

In *200 million years – DURÉE*, imagination irrupts and uses intuition to find something that can unveil the invisible in a nano scale during all this period of time; a possibility arises: to think life as a duration – Bergsonian durée. Bergson establishes that "the essence of duration is to flow ... the flow is the continuance of transition, is the change itself;" [10] to the work under examination, its updating vehicle is the digital animation, what integrates the idea of flow, of a continuous happening, of an event, not matter but energy.

Since the world of nanoscience and nanotechnology floats between matter and energy, all microscopes offer to our eyes can be seen as magic representing something that can not be represented and that constitutes simultaneously the basic stuff of the universe.

The memory, the durée, has to promote changes for new associations that exceed the boundaries of the time spent and include the future. "The real duration means simultaneously indivisible continuity and creation." [11]

THE VIBRATING CHAIR

In order to experience the dominant condition of the nano environment, that of the energy in the boundaries of matter, using a perception relating to the tactile sense, a chair equipped with a vibration engine modified by a device that operates according to the rhythm of the sound of the animation was created. Since the beginning of my research, I considered the effect of vibration as a possibility to include the haptic system in the artwork. When seated, the visitor experiences the matter, seen as compact and still by Newtonian physics, in its energetic quality of atoms and molecules, and experiences the animation in a sensorial perceptive set that spreads throughout the body. I looked for generating a dramatic tension on the visitor that exceeds the daily experience of reality. The intention is to be a participant not a voyeur. One must seat to watch the video.

The images perception is altered when we sit on the chair because the vibration leads to a state of half trance, while liberating the ego to new perceptive apprehensions (when one remains seated for a long time). The sound, the music, is intended to open the soul to new sensitive experiences.

The installation includes the vibrating chair and a video projection on the front wall.

DURÉE

It is the second version of the approached installation. There is a modification including three projections of the same animation, which circle the chair activating all vision fields and creating an immersive environment that emphasizes the ambience magic.

The artwork is not the vibrating chair, but the concept of vibration as an haptic perception which drives to the origin of energy in a field where the connectedness is both macro and nano. The experience includes an inner space and an outer space.

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DIGITAL MEDITERRANEAN AND NEW MEDIA DIALOGUE

Herman Bashiron Mendolicchio

Is it possible to realize a new social and cultural Mediterranean dialogue through media technologies? How does it change the practice of conversation, exchange and dialogue in the digital era? How do art and creativity operate, interact and influence in the “Digital Mediterranean”?

A new media landscape – transformed also by art and creativity - is defining and challenging the social relationships and interactions within the Mediterranean area.

The convergence between art, creativity and new media in the contemporary global framework offers a different way to think about the community with its local connections and intercultural relations. In the Mediterranean context this new way of thinking is currently developing a renewed awareness of concepts like “mobility,” “representation,” “mutual understanding,” “connection,” “dialogue,” “exchange,” “network” and “flux” that help to foster an increasing production of ideas, artworks, seminars, researches and new forms of encounter.

The fields of study and research, the practical applications of creativity, and the cultural production within collaborative spaces are all becoming more and more transversal, hybrid and ambitious. The opening of platforms to share projects and visibility where participants can meet, learn and discuss about the intersections between art, new media and socio-political changes are essential experiences that are seeing an impressive and constant growth.

Intercultural communication is extending and developing itself through multiple mechanisms: we seek, we find ourselves and we interact more regularly through technological tools and social networks that act as platforms for gathering, disseminating and sharing knowledge. Online participation experiences, festivals, exhibitions and virtual galleries, research and dissemination of free information, platforms of social and political criticism, etc., are just some examples of the stages where art, creativity and new information and communication technology meet and converge. Thus the Internet becomes the continent where *multiple cultures, one humanity* coexist (Bauman, 2008), where the in-between element of the border disappears.

As stated by Biserka Cvjetičanin:

“Cultures develop through complex dialogues with other cultures. They cannot develop “next to each other”, but through dialogue and interaction. In today’s digitalized, competitive and conflicting world, no country or region, no society or group can subsist by itself.” [1]

Communication without borders and the encounters between different cultures create new models of plurality and new forms of sociability. The social value of technology and the potential of transcultural networks are generating a new way of intercultural relations and exchange, a new flow of ideas and information, a new sensitivity about global challenges and a better understanding of different cultures. According to Cvjetičanin:

“Today, the entire field of international relations involves the activities of transnational and transcultural networks. They have an important position in redefining global communication and cooperation. (...) Through their non-hierarchical, heterogeneous and horizontal character, and their flexibility, networks foster the exchange of different cultural values and facilitate intercultural dialogue.” [2]

A global transformation in terms of communication and exchange is taking place. The territory of the Mediterranean is now experiencing a deep social change and a new form of interaction between people, places and cultures. The raising use of digital tools and Internet in the Southern Mediterranean and the Middle East is an evidence of these changing realities:

“There are even studies that affirm that the Middle East has the second fastest Internet traffic growth in the world with a growth rate of 97% a year since 2005, below that of South Asia (...) The growing use of the Internet was initially shaped by the demographic structure of the region, intimately linked to youthful protagonists of the region who have perceived the net as a window to the world.” [3]

Equally contemporary art practices have been deeply influenced by the evolution of communication tools and processes and, therefore, have experienced a transformation of their way of perceiving and representing the world. In the universe linked to artistic practices, collaborative models have emerged, and new spaces have been built to meet and to create relational platforms. The current changes, especially in the hybrid territories between art and communication, are many and complex and that is why it is necessary to study and analyse these phenomena from different perspectives.

Thanks to the complexity of the Internet and the enormous popularity of the participatory tools of new media - which belong to the 2.0 generation and model – more and more artistic and creative festivals, exhibitions and events are organized online. Within the 2.0 model we need to mention the “Online Arts Festival” organized by EMYAN (Euro-Med Young Artists Network), whose main objectives are to promote information and communication technology (ICT) tools in relation to arts and creativity. The EMYAN Network proposes a virtual meeting among young artists and researchers in the Euro-Mediterranean area, thereby challenging current problems of borders and mobility. As its organizers explain and highlight:

“The idea of the Online Arts Festival is to nourish the values of social and cultural coexistence of the cultures of the Mediterranean via new media technologies. One of the fundamental aspects of enabling a platform where young artists can participate with their creativity within the Mediterranean arena is the fostering of knowledge, values and perceptions of each other in the region.” [4]

Other exhibition projects, virtual galleries, and e-conferences like the Web Biennial, organized by the Istanbul Contemporary Art Museum, or the Padiglione Internet, linked to the Venice Biennale, are changing the panorama of the art production and its dissemination.

In this new landscape, if we focus on the Mediterranean area, we can find other activities like the online dialogues on art and science in the Mediterranean that take place through the YASMIN list: a “network of artists, scientists, engineers, theoreticians and institutions promoting communication and collaboration in art, science and technology around the Mediterranean Rim.” The need to create new spaces to debate, to share ideas and projects between art, science, communication and technology is also manifest in the mission of IMÈRA centre in Marseille, a place where the Mediterranean became a research space without disciplinary or cultural borders.

Multiple projects coming from the Southern Mediterranean – like the Arab Media Lab or the Arab Platform for Art and Technology (APAT) – contribute to draw a new map and a new language that will challenge and transform the picture of the entire Mediterranean.

There are many questions that arise around this topic:

Is it possible to promote a new social and cultural Mediterranean dialogue through media technologies? How the new media dialogue changes the mutual understanding and knowledge? Is Information and Communication Technology (ICT) a new stand and tool for intercultural education and understanding? How does it change the practice of conversation, exchange and dialogue in the digital era? How do art and creativity operate and interact and what kind of influence do they have in the “Digital Mediterranean”? How have artistic practices, curatorial exercises and cultural production in the Mediterranean changed thanks to new media, digital tools, ICT? What kind of social and political impact have they introduced?

As the Italian artist Michelangelo Pistoletto said:

“Art does not become a policy to express sympathy with an ideology or a system or a party control but rather develops the mission of creating a space that does not yet exist, because we still have to discover how to exist together without conflicts. For this to happen a new way of thinking is necessary, which does not have its origin in a defined system, but in creativity, capable of creating a new fabric of relations between the many beliefs, religions and powers.” [5]

There are several projects that combine real presence and virtual communication between “relational aesthetics” and the tools of Web 2.0. The ambition of these projects concentrates in finding different ways to create connecting points where different Mediterranean cultures and people can meet and share their visions, and their creative expressions and thoughts.

A new media landscape, transformed by art and creativity, is currently defining and challenging the social relationships and interactions within the Mediterranean area.

Digital bridges are converging into a new “Mediterranean Agora” where thought processes, language structures and relational dynamics are involved in a deep structural transition.

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WHAT WOULD WE MEAN BY REALISM?

AMANDA BEECH

This paper asks how speculative realisms may be in fact proposed by the image and explores what conception of the social this operation of the image produces now. If the causal ties between artwork and world are no longer connected or guaranteed, then what conception of the artwork and the social is now drawn? What is this world of images without us?

Technological power as the work of reason, its aestheticization and conceptualization in art and philosophy has been the site of an exploration of what it means to think past the human condition, to face the unknown and to reason out the unfathomable world, cosmos and universe that we inhabit – to avoid the problems of subjective perception and to think the science of objectivity. However, the consequence of this is that any attempt to speak of this non-human orientated world has problematically found itself as the primary correlate to human finitude, unable to surpass the binary formulation of human/nonhuman, subject/object that it claimed did not exist in the first place. By now we know and understand this dualism as a well-worn cliché, especially if we read or watch any sci-fi. The image of ‘technology beyond our control’ has situated our self-understanding of our power, our potentiality *and* our finitude. But what this tells us is that ironically, discussion on anything that we seem unable to control instead becomes quickly refigured as the ideal description of the human in crisis. Therefore, it is human life and human death that are primed as the thing that matters, despite these claims to think past the human condition towards matter itself.

Ernst Jünger’s work in particular plays out the paradox of untying the human from both the image and power and could be said to prefigure these problems. Jünger’s, antimodern fantasies from the 1930’s focus on images of industrial technology as the ultimately non-human. Jünger’s work pictures a totalitarian nightmare or sci-fi horror of an absolute techno-culture, where faceless mechanistic power controls right the way down from the alarm clock that wakes us to the camera lens whose ability to replace and produce reality brings violence ever closer. He writes: “In our technical era the individual appears to be evermore dependent, ‘unfree’ and endangered but the nature of these bonds are less visible than those of the feudal era. Hence they are even more absolute than the absolute monarchies.” [1] For Jünger, the only way to live with this metaphysical force is to embrace it in the form of a romantic nihilistic self-sacrifice. Here the body must become technological so as to “unravel the logic of violence.” [2]

Jünger’s theory seeks to overcome the problems of a representationalist metaphysics as well as the problems of Marxian dialectics by refusing to revolt against techno-Capital as a form of bad dominance. Jünger seeks to think past a tragic definition of human life in the face of a Big Other, but paradoxically does so *for the human* where the image of techno violence becomes site and condition for, and therefore is directly correlative to gauging the success of human power. The formalism encountered here now appears as a form of kitsch and likewise we can say the same for a variety of artistic practices and in particular those most familiar to the body art and performance arts generation around the 1960’s onwards. Here we see that both the body and psyche act as a prime site for a testing of ‘the beyond’ through technology. These practices take an easy place within the history of the subject, a history that often settles in the same schlock mysticism that we see in Jünger’s work. As such, despite its many

claims to be speaking of a world beyond human control, we refer back to a binary formula of that mingles biology and techno-power in an aesthetics of mechanistic cool and abundant excess. Both the body and individual identity remain as the site for this figuration.

What we see emerging here is a central problem; the de-ontologised real of our reality, namely a conception of a post-metaphysical world, is correlated to the forces in our lives that we identify as dominant and pervasive, and beyond our mastery – effectively a matching up of empiricism with transcendence. In other arts practices, and in particular those that share the dialectical methods of Critical Theory, we have seen the identification with language itself as the place of the non-human, where language as our essential technology is understood as alienating and beyond our control, despite it being made by us. This paradox lays the heart of Adorno and Horkheimer's *Dialectic of Enlightenment*, where we see core connections between the image, its ability to manifest power and its (albeit) negatively construed correlation to reality. Adorno and Horkheimer's work looks to how this dimension of language-power figures a crude, barbaric and miasmatic nature in a kind of post political reality that desublimates individual identities to the equivalence of an animalistic totality. The base of the operation is Hollywood, and as we know this highlights a deeper irony where these the two sides have shared a mutual popularization. Crucially, for Adorno and Horkheimer, a knowledge that knows the dialectic is capable of transcending the horrors of similitude, but it is here where this knowledge is expressed where we encounter a key problem. This is centrally because this knowledge is married to a form of mysticism, and significantly this is most evident when it comes to an understanding of art. Here arts re-politicized form is correlated to what is considered to be its essential nature, that is, arts politics is conditioned upon the natural ambiguity of the image.

Furthermore, it is important to dwell for a moment on the contradiction that this twofold status of the image produces. On the one hand the image is considered as the site of a constructed reality that takes the form of nature, and on the other hand it is considered as the means to transcending it. It is the prime symbolic referent to dominance and it has the ability to access a deeper unconditioned reality. To achieve this double operation the image is compelled to become the primary figure for a politics that it claimed it had no access to in the first place. It is asked to be both the guarantee and cause for political transformation. In thinking these asymmetrical demands together the image is mystified further towards a concept of a deeper concept –less nature. Problematically such a conception of the image can only serve to set of the limitations both for itself and politics.

But this problem of how an antihumanist realism can be thought in terms of the image can be does not end here. We see it in the problems of manufacturing the relativity of chaos in the world of the given where reality is represented to us very often in an aesthetics of dissonance, arrhythmic atonal music, base materialism, punk and other visions of excess. These images are first problematic because they are understood easily as genres, their dialectic form simultaneously figures the object of our constraint whilst being the key to our freedom: a nexus that figures the image as the space of torsion. This is opposite to the freedom its authors had hoped to access. But in addition to this, the image becomes an illustration of our relation to it. In aspiring to point to an unmeasured nature beyond us, a world that we cannot master, this image ends up as a weird reflection; the mirror of our nature. It finds its form in a Kantian-style psychosis of mimetic compulsive gestures that resides in the pleasure of a twisted and masochistic anthropocentricism. This image of world beyond us, in fact is a story that narrates our relationship to ourselves. The image can only be for us and by us. Here the big error is easy to spot: an ontological relativity is produced despite claiming its empirical impossibility.

To make some early conclusions:

1) These approaches to meaning is that they assume too quickly that the work of producing meaning is tied to a theory of causation.

2) At the same time and in direct contradiction to this, they assume that the image is naturally free.

If we take these two points together, the image can only be understood as mutually weak and special or evil and banal, a tool for power, but at the same time the figure for freedom. In this schema the last stop for the image is unreason. Ironically it is such a statement that has defined the conditions of arts politics for generations.

3) What is common and also worth focusing on when we look across these materialisms that try to think through the conditions of the world without us, is that they all are subtended by an impoverished theory of meaning. Here we begin to see in much sharper distinction between an image of knowledge that illustrates our relation to language as a form of knowledge and the intended but failed aim to think contingent reality.

Therefore, crucial to this paper is that we think past this problem and more urgently that we re-think the operations of the image that can get past this poor mode of illustration.

Our task therefore is neither to annihilate the image in the name of a true reality nor to assume the image has privileged access to it. To do this I want to draw upon some of the work of Quentin Meillassoux with attention to his arguments in the book, *After Finitude*. Of course if we mention the term politics, then a question of how we comprehend reality has at its center the question of causation, namely, how an understanding of reality might condition and refigure the world that we act within. Having established the landscape of representationalist and causal problems in the past few examples I have discussed, my central aim is to understand how meaning takes place, how words and language can be taken seriously without mapping a version of reality back onto the political or by mapping empirical claims to a transcendental reality. Rather, my aim is to understand how this has consequence for the political and to do this is to commit to a thinking of action through the unbinding of the relations of image, power, and reality.

Meillassoux's work describes a world of super-contingency where any concept of the world being 'for us' is denied and any conception of practical reason is undone. This is a world without guarantees; it means that we have a radical denial of perspective, relations, and consistency. It becomes impossible to subordinate means to ends and therefore threatens any investment in practical means. Instead Meillassoux proposes a truth that is correspondent with our reality, in as much as it guarantees the inability to produce a theory of meaning. "There is nothing beneath or beyond the manifest gratuitousness of the given – nothing but the limitless and lawless power of its destruction, emergence or persistence." [3] Here we enter the realm of hyper chaos where disorder no longer stands as the prime reality of existence, instead contingency is so radical that disorder can be destroyed by order in an equal contingency of order and disorder.

Meillassoux's work refuses to condition another form of access or connectivity, for he asks to us to remember that contingency is banal, since not only does knowing contingency not transcend contingency but for chaos "...to remain chaos, [it] cannot actually bring forth the unthinkable." [4]

So how does this mind independent reality, this description of a contingency that is absolute, have any connection to or place within the formation of politics? The question here then is how this thought of a time without us can be understood without handing back the statement itself to the primacy of the thought that thinks that time without us? On the other hand, what form of knowledge can recognize the primacy of contingency as a fact, without reducing absolute contingency to an object of knowledge? [5] The task now is to understand how Meillassoux's work has consequences for understanding both reason and the image.

Language without correlationalism

A question of the politics of absolute contingency demands that we untie the question about what absolute contingency bears out in the political, from the question of what absolute contingency means 'for us'. We must then take this question from an antihumanist perspective. Reviewing Meillassoux's approach to language it is clear that whilst the representational faculty of the image is understood as inadequate to its object, the work of reason is capable of this adequation. Meillassoux contends, "a reality separate from the subject can be thought by the subject." [6]

Here Meillassoux takes us to the limits of meaning that are proven by scientific reason.

"The fact that I can't imagine the non-existence of subjectivity, since to imagine is to exist as a subject, does not prove it is impossible: I can't imagine what it is like to be dead, since to imagine it means we are still alive, but, unfortunately, this fact does not prove that death is impossible. The limits of my imagination are not the index of my immortality." [7]

These limits are not defined in tragic terms. This 'death as a fact' statement is not reflective of a mortality, or finitude, instead it situates a new potentiality for the work of reason. However, Meillassoux's dedication to scientific thought over a thinking of the image demonstrated in his clear distinction between reason and the imagination sets up a problem since it describes a return to the kind of idealism that he seeks to escape. This is where the thought of the fact of death acts as the fact of non-relationality – a transposition to the primacy of thought it. This idealism is underscored by his rejection of any analysis of how 'the world of the given' is conditioned through such statements, or how such statements emerge within it. Duly, this work creates urgency for a renewed attention to language, specifically this form of rational language and its operations, as well as how this connects to the manifest image. By looking to how meaning works in relation to facticity I hope to overcome the problems of idealism of a particular form of scientific thought as well as the censorship of the imagination that seems core to Meillassoux's argument. I'm not going to go into this in any great detail but in this final section, I'll sketch out a few points that move towards this. The first ties reason to cause, the second looks to absolute contingency as metaphor and the third identifies a heteronomy of reason and imagination.

First of all, the methods that Meillassoux's puts into practice point us to a divergent reading of the operations of reason. Meillassoux's logic is built on a literal approach to language, where facts are facts. Facts are taken seriously to the point that they exceed the subject who claims it. This literalism allows us to identify another form of adequation where reason operates as a form of action and force. Here, language succeeds in transcending the limits of the human and is not refigured back onto it. The work of Donald Davidson lubricates this observation, specifically his assertion that "reasons are as much causes of, as they are explanations for action." [8] Therefore, the make-up of this factual claim is action and reason, and these now appear unbound from a general principle of cause, because cause is simply the non-linguistic physical relation of these objects.

Secondly, it is here where we could say that the work of Meillassoux's absolutism resides within the world of metaphor. According to Davidson, "metaphors mean what the words, in their most literal interpretation, mean, and nothing more." [9] And I think the same goes for Meillassoux – whether he likes it or not – since the thought of the absolute in Meillassoux relies upon the referential qualities of language, both to justify the fact of absolute contingency and equally to cause the unbinding that speculation requires. The reason that thinks the absolute nature of contingency makes absolute contingency the metaphor par excellence, and this metaphor in its absolute nature has to be understood literally. Therefore, whilst representationalism as a mode of producing meaning is limited in Meillassoux's argument, the meaning in its metaphoric operation is alive and well. This opens a vista of new possibilities, just as for Davidson, taking metaphors literally allows for new practices, understandings and meanings to be produced. It is through this metaphoric condition where I'd identify another kind of realism; a realism that produces a mix of the speculative (the might be) and the specific (the matter that is that speculation itself). "This is indeed a speculative thesis, (says Meillassoux) since we are not thinking an absolute, but it is not metaphysical, since we are not thinking any thing (entity) would be absolute." [10]

Thirdly, we must also remember that by Meillassoux's lights we would have to split reason and the imagination as categories that do not and will not meet. However, in thinking reason as cause, or the force of naming facticity we must not only consider the language operations of scientific statements in empirical terms but we must also how the site of the imagination names and produces these facts. Here we can think through how the thought that thinks fact operates in a new heteronomy that complicates any distinction between reason and the imagination, where this force has no will or essential direction, no referent or map, only terminus.

Any reconnection between reason and cause, and reason and the imagination might seem to replicate all of the problems I reviewed at the beginning of this paper. The former might fall back into a some form of instrumentalism and the latter might suggest a renewed focus on the subject, moving us from the problem of idealism of thought in Meillassoux, to another idealism: the subject that thinks thought. However, since there is no principle of cause at work here, there is also no ontology or objectifying concept that would ground these relations, and because we cannot tie this indistinction between reason and the imagination back to a coherent subjectivity that thinks it, since facts are unrelated to human will, we do not idealize either the subject as a thinking being, nor the thinking that is thought by it. There is no longer an image of reason that would operate as the delineation of our knowledge or our finitude and we can avoid the mistake that is to graft some image of our knowledge, as technological reason, at the center of our internal psychological fears or towards some externalizing force of secret dominance that this image may hold.

Taking this to artistic culture, we now can think about a radical untying of what we understand to be the necessary and the instrumental. Whilst Meillassoux's speculative materialism guarantees the unbinding of instrumental reason, the understanding of the condition of meaning and in particular not just what the image can mean but also what a conception of our reality without us means within the reality that we reside. This is a question of meaning without us, and the reconditioning of an understanding of language interpretation as being always already tied to our mind and body – this is an escape from the circle of referents where art is understood as a personal message to us and a general message about us.

Rethinking art as a factually non-relational entity that is also capable of meaning shatters these habits and sets out to evacuate the genres that confuse themselves for a deeper and meaningful experience of a truth. It overcomes the kinds of banal mythologies and nostalgic horrors that recount that which exceeds us, and returns us to a face a different and truly alien world.

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REMOTELY CONNECTED, REMOTELY CREATIVE: LEAPFROGGING THE DIGITAL DIVIDE

Tracey Meziane Benson

What does locative media from remote Australian Indigenous communities look like? How does access to 3G mobile phones impact communications? What media is being created on these devices?

This paper discusses some of the strategies being used in remote Australia to leapfrog the digital divide; scoping the potential to introduce tools that encourage creative development and collaborative cultural engagement focused on skill sharing.



Remotely online, image credit Andrew Taylor

It is often said that Australians pick up on new technologies early, in particular those that assist with communications across distances. However, there is limited Internet access depending on where you live, with many remote communities having no access via phone line modem, broadband cable, satellite or Next G mobile phones. Distance is a great challenge in remote areas as there may be hundreds of kilometres to the next town, making the provision of essential infrastructure and services difficult.

This paper scopes some of the strategies being used in remote Australia to leapfrog the digital divide; and explores some key findings of recent research focused on a number of remote Indigenous communities and access to the Internet and mobile phone networks. The scoping exercise is aimed at developing a best practice approach to collaborating with remote Indigenous communities to develop effective information communications technology (ICT) literacy skills and improved access to communications technology.

Background

My interest in mobile phone Internet delivery evolved from a larger interest in new technology especially accessible and usable web design. I work in a government organisation on a sustainability behaviour change program, which uses a website as the delivery mechanism. There has been significant research undertaken for this project, which includes testing with audiences, using appropriate levels of language, ease of navigation and compliance with web standards.

The decision to research online access for remote Indigenous communities came about after I read an article discussing the high uptake of mobile phones in remote communities, particularly 'smart' phones with 3G Internet access. This was shortly after attending 'Web Directions South 2010' in Sydney where I was switched on to flexible device delivery with a web standards approach (which encompasses accessible and usable design). The developments in HTML and CSS have added increased flexibility and functionality to web design, making websites more elegant and streamlined. Cleaner code can potentially have a big impact on fast online delivery, especially if supporting images, video and documents are compressed.

As a means to build cultural understanding and working collaboratively with Indigenous communities, I became a volunteer for the Indigenous Community Volunteers (ICV) program. This non-government organisation works collaboratively with communities and volunteers to realise projects that foster sustainable community development. So far I have started work on one project that is based in Canberra, *Billabong Aboriginal Development Corporation*, where I am leading a web design project.

The Australian federal government have started the process of implementing a National Broadband Network (NBN), which would not only provide much needed broadband Internet access in the remote locations of Australia, but would also speed up Internet connections in urban areas. But is this the best method for the majority of remote Indigenous communities? Other countries have leapfrogged optic fibre for satellite broadband access to the Internet and this would appear more practical for remote areas.

Identifying a potential need

As mentioned earlier, there are still significant limitations to broadband access in regional and remote locations. In recent studies, it is noted that Indigenous social policy is trending towards the centralisation of services into larger settlements

There is much talk of 'closing the gap' between Indigenous and non-Indigenous Australians and this initiative has implications on a range of issues, most significantly access to health and education services, also other basic services like reliable access to power and communications channels.

“Closing the Gap” is an Australian Government social policy framework that is aimed at addressing Indigenous social disadvantage. In June 2009 an agreement was made between the states and territories of Australia (COAG) and the Australian Government to improve remote Indigenous public Internet access. A 2009 report titled *Closing the Gap: National Partnership Agreement on Remote Indigenous Public Internet Access* committed to investing in a number of priority locations around Australia.

Some facts and figures

The Australian Bureau of Statistics (ABS) reported that at December 2010 there were 10.4 million active Internet subscribers in Australia, compared to 9.6 million in June 2010. What was revealing in one of the tables of this report was that the volume of users accessing the Internet with wireless and mobile devices has been significantly increasing since 2006. According to the data published on the ABS website in December 2010, the use of broadband and wireless/mobile access is almost on par, whereas satellite access has remained static.

The 2006 Australian census of the population revealed that there was 108,143 Indigenous people (0.54% of the total Australian population) living in remote or very remote parts of Australia (ABS2006a). There are 1187 discrete Indigenous communities across Australia. Of these 865 (73%) have a population below 50 and 987 (83%) have a population below 100. The average size of those communities with populations under 100 is 20 people. The majority of the communities identified as remote or very remote are located in the Northern Territory, Queensland and Western Australia. Most of the governments 29 growth towns have a population of more than 300 people.

Cultural need for appropriate engagement

Since white settlement, there has been a plethora of laws and interventions for and about Indigenous Australians. For example, people are often surprised to know that Aboriginal people in Australia did not get the right to vote in elections until 1967. The landmark Referendum of 27 May 1967 approved two amendments to the Australian constitution relating to Indigenous Australians. Technically it was a vote on the *Constitution Alteration (Aboriginal People) 1967* which became law on 10 August 1967 following the results of the referendum. Of the Australian voting public who turned up and voted, 90.77 per cent voted in favour of the changes, which was an overwhelming response to the Referendum questions.

Just to give an example of the dire legal status of Aboriginal people prior to the 1967 Referendum, Western Australian Aboriginal people were controlled by the 1905 Aborigines Act. This Act gave the Chief Protector of Aborigines the powers of legal guardianship over all Aboriginal people to the age of 16 years. This power over-rode any parental legal rights as normally exists between child and parent. Many children, particularly children of mixed descent, were forcibly removed from their parents in droves and placed in white foster homes, missions, orphanages, and hostels. This era in Australian history is often referred to as the ‘Stolen Generations’. Aboriginal parents were often not told where their children were, names were changed or the children told that their parents were dead.

In order to move from under the burden of the 1905 Aborigines Act, Aboriginal people had to gain Australian citizenship. Aboriginal people, under the Australian Constitution, were not considered to be Australian citizens and therefore, Australian citizenship was not automatic. If an Aboriginal person gained Australian citizenship, the 1905 Aborigines Act could no longer control them.

To gain Australian citizenship, Aboriginal people had to complete an application for citizenship in which their 'caste' and the 'caste' of their parents was stated, they had to prove disassociation from Aboriginal people and culture, provide a photo and references as to their good character. This went before a board who decided if citizenship was approved. Once it was gained, the Chief Protector of Aborigines could remove it at any time.

If you did not have citizenship, as an Aboriginal person, you were classified under the Flora and Fauna Act.

In 2008, Labor Prime Minister Kevin Rudd gave a formal apology to Aboriginal people who suffered under this regime. The event was initially seen as significant step towards acknowledging the many mistakes of past government policy. This gesture has been somewhat undermined by the continuation of the previous Liberal (Conservative) governments Northern Territory Emergency Response (NTER), which has seen the implementation of measures that appear extreme, include quarantining of welfare payments, bans on alcohol and pornography and a weakening of native title rights over homelands.

There have been many implications for Indigenous Australian as a result of policy decisions. The NTER, (re-branded and expanded after a change in government and after the formal apology as 'Closing the Gap') has seen many children removed from families. In 2009 it has been reported that 4300 Aboriginal children taken from their parents in New South Wales alone. The reference point that launched the intervention was a report of the Northern Territory Board of Inquiry into the Protection of Aboriginal Children from Sexual Abuse, *Ampe Akelyernemane Meke Mekarle, Little Children Are Sacred*, which found child sexual assault to be widespread throughout Aboriginal communities. These measures are highly contentious and there are a range of views both for and against approaches to managing social issues in remote Indigenous communities.

The problem with past and present government policy implementation is that there has been very little consultation with Aboriginal people about issues that affect them directly and significantly. This very short chronology highlights that there has been a continuing lack of respect and understanding of Aboriginal peoples and their cultures despite some successes.

In contrast, some organisations are making legitimate and serious efforts to engage with Aboriginal people respectfully and sensitively. For example, when I attended the two day training to be a volunteer with ICV, there was a lot of emphasis on how to collaborate with Indigenous communities in a culturally appropriate way. What was also emphasised was that volunteers work on projects that are owned by the community, and of which are focused on sustainable community development. This approach empowers the community to drive the project and build skills and resources for their community and its people.

Relevant research projects

To date there has been limited research undertaken in the area of Internet and communications technology access for remote Indigenous communities and the research that has been undertaken has varied results. For example, in the 2009 research titled *Report to Wujal Wujal Aboriginal shire Council on Mobile Technology in the Bloomfield River Valley*, it was documented that 55% of Indigenous residents interviewed in a survey had owned at least one mobile phone compared to non-Indigenous residents who had 71% ownership. This report also evidenced that there was reliable reception in some areas,

around 50% of the region identified. What was surprising in this report was the relatively low percentage of home based Internet, which was 9.5% and only 7% of private dwellings had a fixed phone line. Another point of interest was that many respondents had the perception that there was widespread use of mobile phones. This may be attributed to many families sharing phones, creating an impression that 'just about everyone has them'.

By contrast, the 2011 report *Home Internet for Remote Indigenous Communities*, focused on three communities Kwale Kwale, Munglawurru and Imangara which all currently have no mobile phone coverage despite 30% of people owning a mobile phone. The people owning mobile phone, purchased the phone to use in town, there was a number Around 30% of this group used mobile phones to access the Internet for music downloads and or chat. Of these three communities only 6% of total residents had a laptop or a home computer, although 58% of people have used a computer at some time. Only two thirds of this group had ever been online and 75% of Internet users were under 30 years of age. This report also documented that the 2006 census revealed that only 20% of Indigenous households in remote and very remote Australia have an Internet connection, compared with 60% of non-Indigenous people in the same statistical area.

Both of these reports signal the importance of providing other alternatives to the NBN. The *Home Internet for Remote Communities* report recommends that a broadband assistance program be established to assist in the implementation of satellite broadband access and Wi-Fi networks. The Wi-Fi network would be available community wide, providing access to any dwelling as a shared resource. The Bloomfield River Valley report recommends to extend coverage in the area, reliable access to computers, train local people in managing mobile phones and the provision of an equitable Universal Service Obligation.

These examples also highlight that there is still a long way to address the digital divide for remote residents. One of the biggest challenges is that because mobile phone uptake is much higher than individual home access to the Internets, people are currently vulnerable to mobile phone companies installing transmitters so they have reliable access to mobile networks.

It has also been mentioned in the media and via word of mouth reports about how mobile phone companies are exploiting customers in remote areas because of limited literacy and awareness of the contracts being entered into.

An excellent video titled *Mobile Moola Matters* by students in Alice Springs High School, was a winner in the 2008 Australian Securities and Investment commission *Moola Matters* competition. The film discusses the dangers of high mobile phone bills. This humorous short film talks about how you can financially manage having a mobile phone with tips like using pre-paid and talking face-to-face instead.

Despite the fact that there is uneven access to communications channels there has been significant investment in media production and broadcasting by Aboriginal people in remote Australia.

Indigenous owned media production

Yuendumu is a community in Central Australia that had relatively early take up of communications technology. Early experimentation with video production, preceded the establishment of a 'pirate' radio station in 1985. Early video production activities at Yuendumu were associated with the Warlpiri Literature Centre.

Walpiri Media's establishment coincided with the federal government's plans to launch the first Australian owned satellite - AUSSAT. The AUSSAT satellite brought national television to much of remote Australia for the first time. The deployment of AUSSAT involved the establishment of a Remote Commercial Television Service, the management of which was put out to tender. Alice Springs based Aboriginal media organisation Central Australian Aboriginal Media Association (CAAMA) was successful in its tender application launching Imparja Television in 1988.

Imparja is a private, fully commercial television company registered in the Northern Territory. It is globally unique, being totally owned and controlled by Northern Territory and South Australian Aboriginal shareholders, who do not receive dividends, investing all profits back into the development of the company. Imparja also provides the satellite access for National Indigenous Television (NITV).

By 1995, Yuendumu had access to email, video conferencing network, two television stations two radio stations and telephone and facsimile. Walpiri Media (now known as PAW Media) continues to have a strong interest in media and creative media production.

About RIPIA (Remote Indigenous Public Internet Access)

In 2009 the Northern Territory Government entered into an Agreement with the Australian Government to provide or improve public Internet access facilities and training services in computer and Internet use to 19 Indigenous communities across the Northern Territory.

The Project is jointly run by the Department of Business and Employment and the Department Natural Resources, Environment, Art and Sports through Northern Territory Library.

RIPIA aims to deliver the following outcomes:

- Increased public access to online resources and services, for financial, educational, health, economic and social purposes;
- Increased awareness of the benefits and uses of online resources and services;
- Increased computer literacy
- Increased information literacy enabling the search for, evaluation and use of online information; and
- Increased Internet use that facilitates transactions and communication with government agencies, businesses, communities and families.

In 2010 the Project was delivered to 19 Indigenous communities. In 2011 the Project will be delivered to 40 Indigenous communities which includes the 19 communities from 2010.

It is also clear from the many conversations I have had with people who have recently spent time in remote communities, that if there is Internet access, then there is a lot of participation on social media channels, mainly Facebook and YouTube. For example, at 1 August 2011 there was well over 1.9 million views of "Zorba the Greek Yolngu style" by the Chooky Dancers www.chookydancers.com, from north-eastern Arnhem Land in Northern Australia. The Chooky Dancers has used the Internet very effectively to promote their work and they have performed in film and on music videos.

Conclusion

At such an early point in the research project there are no significant conclusions as yet, except to state that there is still a significant digital divide for many people living in Australia which will not be sufficiently rectified with the rollout of the NBN. This paper highlights the need for a multi-pronged approach to providing Internet access to remote communities, including 3G mobile Internet and Satellite broadband.

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T/ACT - SOCIAL EMPOWERMENT THROUGH INTERACTION WITH MEDIA ARTWORKS

Andy Best

This paper presents results from research made through a collaborative design process with selected individuals with severe physical disabilities. The work encourages and enables creative expression by the participants beyond everyday norms. Can a disruption of institutionalized conditioning according to class, education, gender and physical abilities be orchestrated by careful design and presentation of interactive artworks?

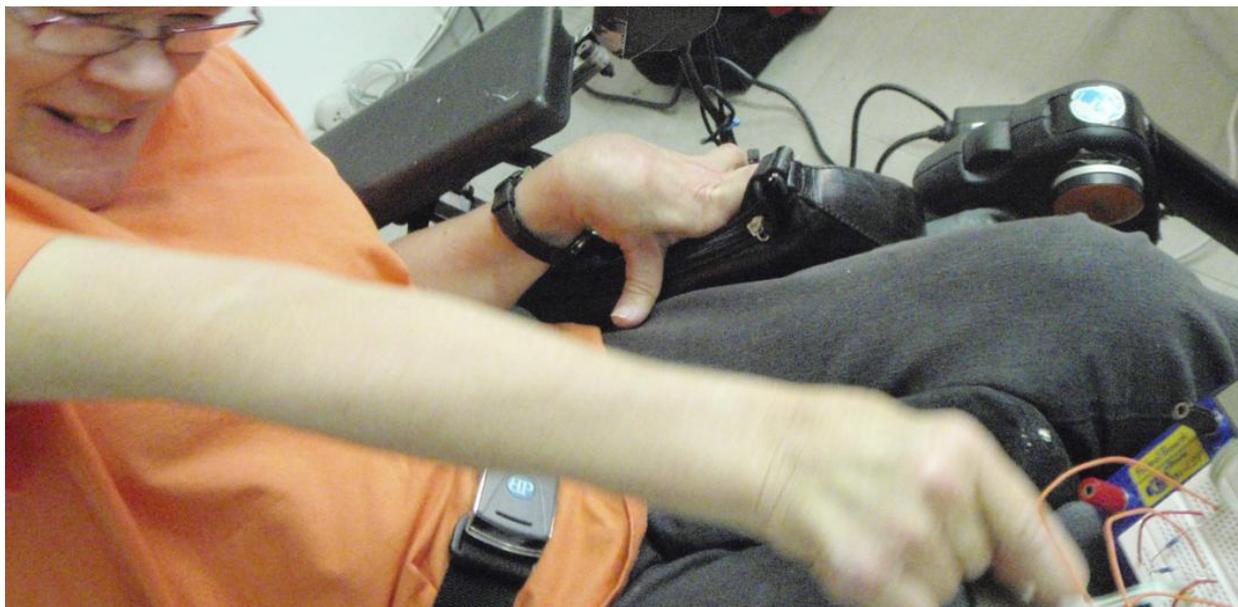


Fig.1. Eeva testing potential interfaces. Taika-tanssi, 2011. Photo copyright the author.



Fig.2. A community of presence evolves within the physically interactive art work. Empty Stomach, 2009, Andy Best & Merja Puustinen, at Eurocultured Festival, Manchester, UK. Photo copyright the author.



Fig.3. Sirpa testing a small drum and sensor. Taika-tanssi, 2011. Photo copyright the author.

Our current lifestyle is focused and reliant upon media technologies. Our lives are organised through and by technology, such that we can easily forget the importance of physical social interaction rather than which are mediated by online social networks. Instead of being empowered by technology, humans are enslaved to its seductive powers. Is it possible to move away from this focus on the technological and rather discuss the act of using the interface and the product of that action and the content? Does access to media technology in itself empower the participant, particularly if that person is herself on the margins of society? The Eye Writer project is a superb example of open source media technologies being used to empower a specific individual (Tempt One) and others with a similar debilitating disease (ALS). [1] As Tempt One himself states:

“Art is a tool of empowerment and social change, and I consider myself blessed to be able to create and use my work to promote health reform, bring awareness about ALS and help others.”

It is clear that the act of empowerment for Tempt One comes through a combination of access to the technology, the ability to once again create graffiti art, and his possibility to have a presence in the public city environment through the large scale urban projections of his tags. Each element is very specific to the individual in question. In the research described in this paper the author attempts a broader area of investigation. Can the use of media technologies enhance the possibilities for people with disabilities to express themselves creatively on equal terms with able bodied people?

This paper presents ongoing research into the effects of physical interaction with audiovisual systems through a discussion of the results and observations from collaborative design workshops organised for

a group of people with disabilities. The author, as a media artist, had not considered working with people with disabilities until a visit by a group of students from Beaumont special school to the Lantern-house International arts centre in the north of England where he was undertaking a residency. As these students with severe cerebral palsy were encouraged to touch and interact with the installation which was on display for them, it became apparent that the colour, form, sound and overall interactive environment they were confronted with provided a powerful and provocative stimulus, causing emotional reactions which surprised their carers. A follow-up visit to the college showed that although well equipped with musical instruments, media and audio software, most solutions were generalized rather than individually tailored to each student's needs. This approach may work for the able-bodied person where we all have approximately the same physical abilities, but for a person with disabilities this can be totally inappropriate and very frustrating for all involved. Together with musician Alan Fitzgerald the author proposed to develop bespoke electronic interfaces for a small group of students. In particular it was hoped to examine the following question: If a unique interface is created specifically for a particular individual, can an examination of the use of this interface lead us to answer questions regarding interface design in general? Unfortunately at the time it was not possible to carry out this project in England, but since the beginning of 2011 the author has been investigating similar themes through participatory design workshops with people with disabilities belonging to the Taika Dance group in Turku, Finland. The majority of the participants are electric wheelchair users and have severely limited use and control of their physical bodies, while some have more mobility. They have their own social networks, yet as a whole they can be regarded as on the margins of society with little voice or visibility. Does access to media technology and the ability to create visual and audio performance lead to a wider social empowerment in society for people like these with disabilities? Does the same effect happen for the wider public at large when they are able to interact deeply with a media art work?

Through a participatory design process, the aim of the workshop sessions has been to develop personal interfaces which might be thought of as bespoke electronic musical instruments made for each individual. Due to the practical difficulties involved with all aspects of the collaboration – logistics, communication, and basic bodily needs – progress has been slow, but fruitful. As this group of people have had no prior possibility to make sound or music, the process started with getting to know each other via “off the shelf” solutions. A midi keyboard and controller were used to provide an immediate experience of actually creating different sounds. Using Max/MSP and Reason software, samples and sound parameters could easily be modified. Sounds were also recorded from the participants own voices and mobile phones to use as samples. Even at this simple level, the experience of hearing one's own voice played back and modified to create interesting or weird sounds was stimulating for the group. Participants soon felt confident to contribute their own ideas and suggestions for the sounds.

The next level of interaction involved gradually introducing different types of electronic sensors and interfaces, allowing the participants to experiment and play with sound in ways that were totally new for them. The author is familiar with using analogue sensors for data collection, interfacing through the Arduino microcontroller to PCs. Now it was necessary to develop methods of using the electronics so that they would not restrict the users' limited physical movements. Fortunately there are many small footprint solutions readily available on the market. The selected solution was to use short range radios to send the data to remote PCs. The X-Bee radio together with an Arduino Fio has so far proven to be the best solution, as radios can be networked to send data simultaneously to one PC. The type of sensors used range from simple flex and pressure sensors, accelerometers, and compass modules, to perhaps the most useful, the 9 DOF Razor IMU which provides angle of orientation data in all directions. [2] The emphasis on hardware development had been on the novel use of existing electronic components and not the actual development of new technology per se, although this does include the creation of custom

sensors and switches using soft circuitry for example. The exploitation of small wireless devices means that the usual restrictions caused by signal wires are removed, and any impediments to the physical body are minimized. The approach used is to concentrate on the movements that the participants are able to make, rather than design an interface that they would have to adapt to.

The focus is on ABILITY rather than DIS-ability. They play according to their own abilities, and can focus on developing that skill. The aim is to discover appropriate forms of interface and sound according to each person's physical abilities and musical interest. The dynamics of social interaction between the members of the group is also mediated by the technology. It can be observed that there is an eagerness to be the one performing. At the current stage of the project only one or two people have been able to use the interfaces simultaneously. Now that the physical abilities of each of the members have been understood, appropriate personalised interfaces are under development.

As much as possible the motivation for the design of these interfaces comes from the participants themselves as they experiment with the prototypes. One example is a control interface made as a cushion for a wheelchair user – she can control media and play sounds by shifting her weight on the chair. Made with Arduino and Open Frameworks, the interface is very sensitive, intuitive and fun to use. It can be thought of as a dance mat for wheelchair users, yet it is equally useable by the able-bodied. This is at the core of the research: through the development of new media interfaces for a small group of very particular people, gain insight into empowerment through human interaction with audio visual systems in general. Even though the participants have sensory systems different to the regular population, the goal is to make this difference invisible through the medium of the art performance. With the Taika Dance group the aim is to perform publically at the end of 2011.

The use of computer mediated technologies opens up further possibilities for social interaction. Networked technologies, such as video, audio and telematic control of devices allow these physically challenged participants to interact with others over large distances (such as Finland-UK). There is the potential to enable people with disabilities to collaborate remotely and perform highly advanced works to a geographically dispersed public audience. The use of telematic and virtual spaces allows flexibility in developing personal navigable space for each participant – finding the comfort zone for each individual is extremely important when they may not feel comfortable exposing their physical self to a live audience, but a tele-mediated performance maybe an exciting and liberating alternative. The author can foresee other groups of users/participants such as older people making use of these same systems to create their own networked performative works, mixing the security of their personal space with the empowerment of performing to a virtual audience online.

Collaborative performance shifts interaction and participatory behaviour onto a social level. The research aims to develop a methodology for observing the changing role of creator-interactor-viewer and the effects on the social interaction of the participants. How does narrative structure and a shared sense of social space lead towards development of temporary community? In the case of the Taika Dance group, the participants are already known to each other, but through the performative act they are able to transform their own self-image and their perceived role in society. They become activators of their own destiny for that moment in time – they are no-longer abject objects on the margins of society but proud performers in their own right. These works enable investigation of enactive engagement in collaborative activity with playful, participatory artworks, environments and performances. These include accessible and easy use – easy control interfaces that give inexperienced users control over creative acts and allow them to explore artistic experience through their natural body movements and perceptually guided actions.

The dialectical method facilitates the benchmarking of the generalist approach with that of the highly defined individually focused approach. By focusing on people with special needs (brain damage, physical handicap) in this case, the research adds to the discussion of reactions to interaction stimuli and control in the average adult human. Just as the blind person's sense of hearing is amplified, so it may be that someone with severely limited movement can actually have an acute sense of control over a range far too limited for the normal person to perceive. Work by Saranjit Birdi with special needs patients in the UK supports this proposition. [3] The bespoke device or environment designed for the individual also acts as a window into their world, as we are able to experience the physical or virtual world through their interface, their experience. In particular Merleau-Ponty's discussion of the body schema illustrates how examination of a unique individual helps us to understand the wider landscape. [4]

As is alluded to in the title of this paper, the motivation for the research is to understand if and how social empowerment can be orchestrated through interaction with media artworks. Can a disruption or disturbance of institutionalized conditioning according to class, education, gender and physical abilities be affected by careful design and presentation of the interactive artwork? It is vital that the interactive experience invites and encourages social interaction between the participants themselves, as it is only through social activity that the self-image can be positively developed. Can the artwork create a community of presence, an opportunity for living in the moment leading to unpredictable (inter)activity within the social group? The artistic TAZ (Temporary Autonomous Zone) acts as a revealing agent within society using the tools of poetic terrorism to disrupt the status quo. [5] Hakim Bey's concept of the Temporary Autonomous Zone has been proposed by Geert Lovink as a model for network based communities of interest. [6] Having worked extensively with 3D virtual communities in the past, the author can say that the behaviours observed in physically interactive environments can be identical to those seen in the TAZ of virtual communities. The physical artwork (environment, installation) becomes a point of focus for social interaction AND empowerment, as the normal rules of engagement within the public (museum) space are temporarily ignored in favour of those created by the participants themselves. We are forced to reappraise the traditional models for spectator vs. artist, as new tools and technologies allow the barriers to interaction to become transparent. The role of the artist or designer changes to become that of a facilitator or producer for a larger group of participants. In fact, the artist creates the situation, and the possibilities for others to bring to life, and accordingly the role of the artist as the author becomes less significant. Curator and theorist Nicolas Bourriaud regards that we have passed into a new "altermodern" era where artistic production is concerned with the weaving of "relationships" between people and things, where the artist "viatorises" objects to build narratives through "post production" techniques – the re-use of artefacts, sampling, a mixing of cultures and signs. [7] The discourse, the social activity, becomes the work itself.

By contrasting the generic with the specific, this research has set out to uncover new information about the benefits, desire and motivation to interact with complex technologically driven systems, as well as proposals for rules and methods for the creation of artistic communities of presence. The work together with Taika Dance encourages and enables creative expression by the participants beyond their everyday norms. The eventual goal is to have an understanding of how to enable deep audience participation in live performative events and interactive environments through their interaction and control of audiovisual and robotic systems.

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CO-CREATIVE USE OF DIGITAL TECHNOLOGIES IN A POSTCOLONIAL CONTEXT

Joëlle Bitton & Atau Tanaka

We present a series of artist-led interventions with the Festival de l'Eau in Burkina Faso, that span the decade, 2000-2010. Its long term nature offers rare insight into sustained relationships with rural, hard to reach communities. We reflect on the ways the collaborative creative situations we established can draw upon similar processes as participatory design and whether they are relevant in a context of North-South cultural exchange.



Camel Zecri, co-organiser of Festival de l'Eau, in discussion with village elders in Léri.

INTRODUCTION

The Festival de l'Eau went to Burkina Faso in 2000 and came back in 2010. This particular context allowed for a sustained relationship with rural, hard to reach communities. By bringing electronic media technologies to destinations off the grid from main information and utilities infrastructures situates these means of creative production in contexts that reveal their potential to facilitate cross cultural communication and actualization of local identity in global contexts.

We describe in this paper the approach of the Festival de l'Eau and some of the activities that involved both the artists and the local population in an often spontaneous, collaborative way. "Postcolonial computing," as coined by Irani in the domain of human-computer interaction (HCI), offers an "alternative sensibility to the process of design" that acknowledges the cultural specificity of a location and the questions of power at stake with the use of digital technologies. [5] Here we apply Irani's analytical framework exposing the "culturally located and power laden" aspects of design practice, to the creative arts. We consider whether the collaborative creative situations we established in Burkina Faso draw upon similar processes from bottom-up methods of participatory design and whether they are relevant in a context of North-South cultural exchange.

FESTIVAL DE L'EAU

The Festival de l'Eau is an artist-led initiative of musicians Camel Zekri and Dominique Chevaucher, founded in the late 1990's with a series of artist exchanges between Europe and Africa that took place in the form of concert tours by boat to remote villages in Niger, the Central African Republic, and Burkina Faso. This was followed by concerts on alternate years in Europe with the African musicians met on location. While the project uses the word, "festival" in its title, it is not a regular artistic event in the classic sense of the word. It was, instead, a series of itinerant activities focusing on improvised music as a conduit to cultural exchange. In this sense, the word festival is used in its definition as celebration – festival de l'eau as "celebration of water."

In 2000, a group of 15 European musicians toured six rural villages along the Mouhoun River in Burkina Faso. The tour took place by boat, allowing the artists to reach villages that were inaccessible by road and entirely off the utilities and power grid. A gasoline driven electric generator powered a sound system, laptop computers, and synthesizers to enable performances of electronic music alongside traditional African music. In 2001, 2003, and 2009, the same group of musicians from Europe and Burkina Faso met again for concerts in European venues such as the Fondation Cartier in Paris.

In 2010, four of the original European musicians regrouped to revisit some of the same villages. While in 2000, the tour by pirogue (a canoe-like river boat) took 3 weeks and toured six villages, the 2010 tour was abbreviated – taking place by van in just one week, and revisiting 3 of the 6 villages. While there had been advances in infrastructure over the decade since the original journey, two of the three villages remained without electricity, and access to one of them by van was arduous.

Chevaucher and Zekri had worked with video archives from the 2000 tour to produce four short films: one presenting the Festival de l'Eau in an impressionistic documentary, and one film for each of the 3 villages revisited in 2010 specifically documenting the arrival, meeting, encampment, and concert in 2000. At the beginning of the evening event and concert, the film corresponding to that village was screened for the inhabitants of the village outdoors in public space. We sought to identify villagers who might have been present at the original 2000 tour, perhaps appeared in the film, for interview.

For the 2010 return, the Festival de l'Eau invited researchers from the Social Inclusion through the Digital Economy (SiDE) project at Culture Lab Newcastle. [10] With this involvement, one additional field researcher and a battery of portable media capture equipment was deployed to document the encounter and to deliver additional activities beyond music concerts. The availability of video projection equipment locally to supplement this added a visual component not present in the 2000 edition of the festival.

DIGITAL PHOTOGRAPHY WORKSHOP

In addition to the film screening and concerts, at one village, in Léri, we conducted a half-day digital photography workshop in the village school. The group was comprised of twelve school children aged between 11 and 13.

The workshop began with mutual oral introductions, with each student writing their name on sheets of paper that were later used as chapter marks in the final slide show of photographs. We next distributed 3 low cost, minimally featured digital cameras, and introduced their basic operation, and practiced with them in the classroom. We formed three groups of four children (each group comprised of two girls and

two boys) and sent on a photographic journey of the village, each accompanied by one of the researchers or musicians. In each group, the four children took their turn with one digital camera, snapping photos of their village and their surroundings.

After an initial tour of the village, the children went back to the classroom and downloaded the pictures onto a laptop computer. As a group, we looked at them together and commented on them. One of the groups went out on a second tour, this time without an accompanying adult. The workshop facilitators compiled a slide show of all the photographs, and used images of the paper sheets with handwritten names to identify which group had taken which photos. In the evening, after the film screening and before the concert, the slide show was projected using the video projector for all in the village.

OBSERVATIONS

The Festival de l'Eau was organised in an artist-led, grassroots manner. This enabled it to be agile, and access remote villages that had not attracted the attention of larger scale cultural initiatives, humanitarian or industrial initiatives. The villages were chosen in part by the festival organisers for these reasons. While this gave us a rare glimpse into daily life in rural Burkina Faso at a human proximity that might otherwise be difficult to achieve, the outcomes of the work, and the impact of cultural exchange are difficult to quantify. Here we offer empirical reflection on the effect we observed, and the interaction we engaged in, that touches on the effects of memory of a decade-long re-encounter, and question of identity, and the potential of a culturally, politically neutral use of digital technologies as facilitator of cultural exchange.

The most compelling opportunity presented by the project was the ten year time span over which it took place. This offered a unique chance to conduct a longitudinal study, all within the constraints and limits of improvised encounters. To have remained in contact, or to have re-contacted three of the same villages a decade apart means that a long term relationship had been established, lending a real form of legacy to the original 2000 trip. According to the organisers, Chevaucher and Zekri, the ephemeral and transitory nature of cultural exchange is often an element that can undermine deeper ties. Here we can argue that a form of sustained relationship had been established, cultivating trust that enabled rich interaction on the return despite its more rapid nature, and facilitated the increased types of activity conducted on the second trip.

The ten year span of images created a unique situation for reflexivity and memory. We documented the reaction of villagers as they viewed the film of the 2000 trip with video cameras. Individual moments of recognition, surprise, and collective reactions of glee were characteristic. Children saw their parents at a younger age. Some revered village elders had since passed away and were remembered. That there was a clear joy and enthusiasm upon our return, and a real memory of the 2000 event. Our return was a total surprise, and the resulting happiness was the clearest emotion that was expressed in conversation.

We attempted, with limited success, to organise interviews with and ask casual questions of those who may have been at the concert in 2000. In one extended interview, conducted through a non-professional interpreter, of a villager Zante Kolé in the village of Walo, we were able to make the following observations. The interviewee took the opportunity of the interview to articulate a need for development and infrastructural improvements to take place in order to enhance the quality of life and socio-economic viability of the village. This was corroborated in two other interviews in the city of Dedougou and

town of Ouessa, where discussion of the need of infrastructural improvements touched on Internet access. The question remains whether articulation of this need was opportunistic or whether it is tied in a more profound way to the form of cultural exchange we put in place. Tempering expectation to the bounds of the original (in this case artistic) mission is instrumental here.

In the digital photography workshop, we gave very few directions as to what the children were to capture with the cameras. In one of the group, a certain girl, Odette decided to take pictures of her household and courtyard, the other one, Asséta, took pictures of the cotton exchange market, one of the boy, Souleymane, reported on a family courtyard and the other one, Drissa, took pictures of people in the back alleys of the village. After they were able to see the pictures when they came back to their classroom, we invited them to do another round of documentation, this time on their own. From the pictures they brought back the second time, we noticed that they were more focused on the subjects and attentive at details: they reported on a funeral that was happening that morning, by the village mosque. Looking at the first batch of pictures and being able to reflect back at them may have guided them to choose to report on a unique event.

Mutual trust that had been developed over the course of the decade-long relationship created a situation where rights to image and to video and photographic representation were not issues.

The Festival de l'Eau not only offered a context of transcultural musical collaboration but also invited the local population to attend a video screening and to look back at a ten-year old event to which their village participated. Involving the new generation into a digital photography workshop as they documented the life of their village for one morning and conducting spontaneous interviews throughout the journey enabled the festival to pursue an informal cultural exchange with the local population, initiated years before and in another form than musical.

With these creative means - music, digital photography, video interview, we aimed to establish a relationship with the people we would interact with, that would be driven by a collaborative approach and not be based on power. We draw upon fields of participatory design and apply a bottom up design ethos to the creative use of digital technologies.

Co-creation (co-design, co-created creative expression) allows users of a particular product, system or service to actively participate to and to share responsibilities in the design process and its outcomes. The expansion of participatory design methods have influenced a shift in design practice, [7] particularly where digital technology, interaction design, creative practice and interdisciplinary research are involved - an environment that the researchers involved in this project are coming from.

The participatory approach in co-creative use of digital technologies allows us to introduce these technologies to the local population in a non-prescriptive way. This offers an alternative to power-based, hierarchical and top-down decision-making processes that impose technology on new users, and may in certain circumstances overlook needs that can variate according to cultural or practical contexts. [5]

Because the project was undertaken in a West African country, we address the potential heightened relevance of participatory design in a non-Western context and its possible role in bridging the "digital divide." [3] Indeed, we can relate these ambitions of non-power driven relationships to the aspirations at play in postcolonialism : that of contesting colonialism's power structures and remaining hierarchical heritage. [1] And we notice that other projects seem to have certain similarities in term of context,

methodology and tools, thus possibly constituting a wider acceptance of co-creative processes among researchers, and practitioners. [6]

COLLABORATIVE APPROACH IN RELATED WORK

Our approach builds upon those of similar creative projects that place an emphasis on digital technologies, cultural exchange and participatory design in non-Western contexts and in African countries.

There are a number of projects initiated by research laboratories and institutes. *RAW* is an audiophotography project developed at the Media Lab Europe Human Connectedness group and took place in Mali. It deployed audio and still-image recording technologies configured in such a way as to afford capturing accounts of everyday life with minimal mediation by third parties. [2] By shifting the attention to the ordinary (as opposed to extra-ordinary events), the project aimed to enable accounts less pervious to stereotypes and clichés that might blur the understanding of a different culture than one’s own. Furthermore, the content remained unedited throughout the process (“raw”), implementing what was called a “minimal mediation” from the researchers involved (or third-parties). And as it integrated a non-selection process in its design, the authors of the accounts were spontaneous and direct in their approach of the content recorded. Yet, it assumes that it’s not entirely a bottom-up approach as the concept was originally driven by an artist’s perspective.

Mobile Learning for Development, of London Knowledge Lab, looks at international development, mobile technologies and learning in Nigeria, Kenya, and Zambia. It establishes a dynamic of co-design in the creation of knowledge exchange platforms through a series of workshops and open online resources.

Made in Burkina is a project developed by the Madeira Interactive Technologies Institute which leveraged support of media companies, European local government, and World Bank funded African NGO’s to put in place broadband infrastructure in provincial Burkina Faso. In the researcher’s report of his work, it’s relevant to note that as he came to install an infrastructure and teach local population uses of Internet tools for communication and even micro-businesses (such as Google tools, YouTube, online publisher Lulu, etc), he also drew design lessons from his observations of local uses of services and from the projects elaborated by the participants of his workshops. These design lessons are shaping his current work. [4]

Events such as conferences and festivals in cultural and other sectors promote local initiatives through participation in international networks. Forum InnovAfrica presented innovative initiatives in communication and information technologies in francophone West Africa and was organised as a collaboration of Fondation Internet Nouvelle Génération (FING), a French technology innovation NGO and ANPE Mali, the Malian employment agency.

Kër Thiossane is a Dakar-based organization and place that promotes creativity and cultural expression, in particular with new media technologies. They have established Rose des vents numériques, a knowledge sharing network and program between Senegal, Mali, South Africa and the Caribbeans, within which have been organized festivals such as AfroPixel, artist residencies and workshops. International grassroots meetings in “Do It Yourself” (DIY) movements have had local chapters in Africa, with *Upgrade!Dakar* promoting local digital artists and practitioners as part of the international Upgrade! Network.

CONCLUSIONS

Based on the observations made in our field work and the different studies cited above, we argue for a collaborative approach and co-design processes that support the case for non-power driven relationships. Furthermore, we consider that elements at stake in participatory design - user-centred design, empowerment, responsibility, democratisation of process - can be relevant in post-colonialism contexts where the local population may not have been involved in decision-making processes and bear the consequences of non-adapted solutions, such as digital technologies, brought on by Western interests. [9]

Because digital technologies are the tools that form the basis of the collaboration we propose, be they through our own design, or simply through creatively use (re-use or misuse), we should address the values that they carry in a post-colonial context. Studies surrounding the “digital divide” [8] address issues of unequal access to technology and policy centered on access may be criticized on the basis that digital technology enforces a gap. Could it be that within its design and uses, digital technology could enable an equal type of relationship? The argument could be made that with technology that is developed in a Western country, that power still lies in with the owner of the technology. While it would be simplistic to consider that this is not an issue, recent world events do point to cases where, for example, knowledge sharing with social networking, can enable forms of empowerment. A collaborative arts-based approach, as we document here, makes possible ways of introducing digital technology in co-creative ways, ways in which all parties involved define, subvert or reinvent its uses and outcomes.

ACKNOWLEDGEMENTS

We thank the organisers and audience of the Festival de l'Eau.

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THE AESTHETICS OF DISAPPEARANCE: CLIMATE CHANGE, ANTARCTICA AND THE CONTEMPORARY SUBLIME IN THE WORK OF ANNE NOBLE, CONNIE SAMARAS AND JUDIT HERSKO

Lisa E. Bloom

This paper discusses a shift in representation of the Polar Regions from the older aesthetic tradition of the sublime as pure heroic wilderness to the aesthetic of the contemporary sublime wherein categories of both nature and civilization are undone because extreme nature is disappearing. By focusing on the work of three artists this paper asks: What new stories and images are being produced through recent attempts to re-visualize the Antarctic.



Fig 1. With Scott at the South Pole, 2010, Judit Hersko, collage, Copyright Judit Hersko.



Fig 2. Barne Glacier, Antarctic Center, 2001, Anne Noble, photograph, Copyright Anne Noble.

In the last ten years, global warming has brought renewed attention to the Antarctic, as scientists and the media report almost daily on shrinking ice masses. Recently, there has been a shift in the representation of the Polar Regions from the older aesthetic tradition of the sublime as pure heroic wilderness to a contemporary sublime that visualizes Antarctica as a place of fascinating terror and beauty not because of its remoteness or severe climate but rather as a result of man-made climate change and neo-liberal economics. [1]

If the traditional sublime introduced danger to the act of viewing extreme nature as thought by both Burke and Kant in the 18th century, [2] the contemporary sublime is about the undoing of the categories of both nature and civilization because extreme nature is disappearing. [3] The Polar Regions have shifted from being the last space of heroic exploration to the first place of global decline. As the ground zero of catastrophic climate change, the Antarctic is no longer seen as simply the continent most extreme and inhospitable to humans.

How we see Antarctica now is in marked contrast to most of its short history, a space that was radically uninhabited and afterwards conceived as a place where only the presence of men was deemed appropriate. Just who belongs in Antarctica has now become an especially vexed issue for contemporary women artists because only in the last few decades have women been permitted to work on scientific bases, as researchers and as maintenance workers and more recently as artists and writers. [4] By focusing on the work of three women artists that traveled to Antarctica--Judith Hersko, Anne Noble and Connie Samaras-- I ask, what do these women artists see in a place where their history has been so brief? [Fig.1-2] This is not to beg the essentialist question but to ask how their work has changed our ways of seeing this region as a primary site of the contemporary experience of the sublime and climate change.

As I wrote in my first book *Gender on Ice* (1993), polar exploration narratives in the late 19th and early 20th centuries redefined the legacy of the Heroic Age of Arctic and Antarctic exploration (1895-1914) in explicitly gendered terms as spaces of male bonding, conquest and suffering. In the early 20th century both the North and South Poles represented one of the few remaining masculine testing grounds where "adventure and hardship could still be faced." [5]

As climate change melts the ice we are seeing a re-emergence of interest in polar narratives marketing an imperial masculinity that were the subject of this earlier critique. The surge of interest since the late 1990s is exemplified by recent reprintings of original exploration accounts, new biographies of 19th and early 20th century explorers, and even reality TV simulated re-enactments of their journeys.

Almost one hundred years later, the Antarctic is no longer the site of a privileged white masculinity and these regions are no longer understood as just remote or forbidden areas, but rather as spaces closely if complexly connected to globalized and political forces that also impact the rest of the world. In what follows I will examine how artists Judith Hersko, Anne Noble and Connie Samaras are playing off or in dialogue with issues raised in my book about the Heroic Age of exploration, science, and photography and how these discourses are reworked in the context of twenty-first century artistic practices. In what follow I present their work as a dialogic set of texts that move in new artistic directions beyond the bounds of my original inquiry, contemplating new forms of critical awareness about climate change and the paradox of human belonging in Antarctica now. The title, *The Aesthetics of Disappearance*, is meant to underscore this link between art, aesthetics, new media, science, global warming and culture. It brings back the issue of aesthetics and feminism to discussions within new media, and questions how much older narratives of male heroic exploration and colonialism are still part of the discourse.

Amelia Jones, the contemporary art historian, in her 2006 book *Self/Image: Technology, Representation and the Contemporary Subject*, argues that the most important legacy of feminism is its politics of positionality across the visual. By that she means the importance of emphasizing the situatedness of positionality, of visibility, and of spectatorship. Noble and Samaras are interested in the social space of taking photographs and their performances behind the camera are committed to recording their embodied relationship to Antarctica. For Samaras and Noble, that means highlighting the sense of dislocation and anxiety involved in living in such an extreme environment. In *Gender on Ice*, I pointed out how this is negotiated in the British early 20th century Scott narrative in which the gendered, physical body is replaced by moral character, which provided the foundation on which masculinity becomes heroicized and the exterior world loses its concreteness. Samaras' and Noble's work is not about heroic masculinity but something much more displaced, related to both their positionality as well as the placelessness of the site that they both photograph. Their detailed focus on the everyday moves us away from narratives that erase or ignore the real life suffering and counters the romanticism and fantasies of transcendence of the body through moral character that characterizes so much of the British discourse in Antarctica. At the same time, fantasy as evoked by science fiction is key to understanding Samaras' work. Samaras evokes how alien the landscape is in Antarctica, when she, for example, foregrounds how uncontrollable the ice is as it swallows up buildings and signs of life in photographs of the Buckminster Fuller Dome in *Domes and Tunnels*, in *Night Divide and Contrails* and in *Buried Fifties Station*.

If Hersko brings us back to the earlier days of polar explorers and the epic by inserting her unknown Jewish woman explorer in her fantasized re-enactment of the Scott expedition, [Fig.1] Samaras pulls us away, bringing us into another fantasy space where she plays with the abstract even inhuman aspect of Antarctica to make us imagine how climate change and globalization have transformed these spaces in ways we otherwise would not have imagined. By refusing the aesthetics of the sublime from the heroic age, Samaras highlights the unreality, as well as the drab ordinariness of this landscape and built environment. By virtue of her photographs that situate banal architecture in a sublime landscape, she draws our attention to the surreal contrast between the everyday and the heroic.

This is also an important concern for Noble especially in her *Whiteout Series*, but her use of color in the Antarctic displays, the *Piss Poles*, and the *Machine Series* tends to be more visceral than Samaras' to capture the sheer physical attraction and presence of what she photographs. Noble's method is to use beauty in her work in an unexpected and even jarring way to get us to retrieve the Antarctic that implicitly questions the framing of the Antarctic landscape as heroic and sublime. [Fig.2] In her work titled *Aurina* that is comprised of six large photographs of "piss poles" taken at various US research locations. Her documentation of the everyday use of flags as identity markers for peeing outdoors at many remote field camps in Antarctica is a deadpan twist to narratives of early 20th century nationalisms in which flags enjoyed an exalted status in the context of British colonialism. Not only has the heroic national banner been reduced to piss poles in her work, but she further banalizes them by shooting them in such a way to make them resemble golf course flags. To underscore the contrast between the piss poles and the flags of conquest connected with older narratives of colonialism and polar exploration that they inadvertently seem to mimic she refuses certain typical conventions of discovery, the horizon, the high vantage point, the gaze of acquisitional ownership. Instead, some of these images seek flatness by cutting out the landscape altogether or including a small portion not of a pristine landscape but of a more industrial one. The title *Aurina* refers to "aura," "aurinia" and "urine" and her images like her play on words also brings together visually dissimilar things such as the heroic dawn, a purse of gold, and male urine. What stands out is her jarring use of the color of gold that brings all three together, a color she then uses effectively to set the aesthetic quality of the image at odds with the content. Like in the *Barne Glacier* (2001), [Fig.2] she turns the most impossible and mundane evidence of human presence, the

stain of urine in a pristine landscape into an object of beauty rather than revulsion to make us aware of how the reverential attitude toward the heroic age can also extend to scientists who often see their pursuit of scientific research in Antarctica as following in the footsteps of the earlier explorers from the Heroic Age.

Noble's use of color is in contrast to Hersko whose aesthetic is drawn from the early history of photography, cinema, and photo-collage. Her photo-collages, transparent sculptures, and cinematic projections work more with shadow, light and transparency rather than color. Hersko downplays the heroic by having most of her images gradually disappear or having her characters fade in or out, whereas Samaras plays with disappearance by representing the older built environment of Antarctica sinking into the permafrost. By challenging documentary conventions in critical ways, such as her unsettling blurring of the boundaries between the artificial and the natural, she draws on the genres of science fiction and horror to give artistic expression to her experience of Antarctica, both in its routine everyday aspects and in its surreal extremes. This aesthetic strategy enables Samaras to visualize a neo-liberal sublime in which Antarctica on one level becomes like the rest of the world in terms of its built environment, but at the same time remains an exception and outside of nature as when she gives us something on a human scale we get either coffins or a ghostly presence of a man fast asleep on a transport plane. [6]

Hersko's use of science fiction, by contrast, is less about the paranormal but of feminist time-travel as evoked by Ursula Le Guin's *Sur*. She situates us in the past to reimagine the present through the embodied positionality of her female characters and their ability to reinvent themselves or escape themselves through writing, science and photography. Moreover, she critiques the scientific ideal that calls for professional detachment and scientific proofs, and the way scientific authority resides in the effacement of the speaking and experiencing subject. Despite the dreamlike quality of her images and narrative, the viewer or audience is included in the experience of her work as a participant, not a distanced observer. This is done through our fascination with her sensuous images and the compelling narrative point of view she offers in her performance to make us contemplate how this landscape is forever colored by its destruction through catastrophic climate change.

Irony is critical to Samaras' aesthetic as it is to Noble's, though Hersko's use of irony is similar to that of the surrealists. She returns to the heroic registers of the early twentieth century to perversely restage a masculinist imperial past within a neo-liberal present, whereas Noble's use of irony recalls that of the postmodernists that intervene in a discourse that confidently explores, maps and visualizes a space, thus turning it into a place we now claim to consume. Noble reworks contemporary images of Antarctica to examine the visual tropes that contribute to the maintenance of the perception that Antarctica is still an all-male continent or a living memorial to the good old days when only men could populate the continent. The creative challenges of Noble's work is her examination of how gender is implicated in her questioning of how we should see Antarctica in a context in which we can no longer distinguish between its everyday facticity and its cultural representation, as a place that is still very much constituted by male heroic narratives and imagery of the Heroic Age.

Her work explores what the formerly heroic age of exploration means through work such as *The Barne Glacier* (2001) [Fig.2] where Noble presents two tourists in survival coats before a panoramic painting of the Barne Glacier in an Antarctic-themed indoor entertainment center. Critical to the photographic history of Antarctica are the canonical photographic works of Ponting and Hurley that become synonymous with the heroic and sublime visual tropes of stoic heroism in the face of deadly conditions. Her work references Ponting's image of the Barne Glacier that emphasizes the magnitude of this uninhabitable landscape. In Ponting's photograph the epic scale of the glacier dominates the image to such an extent that

the figure in the landscape is dwarfed by comparison. In many ways this image provides an ideal image of sublime wilderness since it shows the inhospitable male space of the Antarctic as a testing ground in which isolation and physical danger combine with overwhelming beauty. Noble's photographs however reverse Ponting's use of beauty and space. Her images are much more tightly framed and almost claustrophobic robbing the setting of its epic character. While the photographic beauty of her images is central to the meaning, she is also asking us to rethink the way we currently understand the sublime in the present.

In her image *The Barne Glacier* (2001) [Fig.2] she draws out the beauty of the sublime in her use of color and light in an artificial simulated landscape environment to make an uncanny commentary about the continuing cultural investment in Hurley's and Barne's work and the contradictions between the Antarctica visualized in Ponting's and Hurley's photographs and the kitsch aesthetic of sublime wilderness now produced in indoor settings like the Antarctic Center where she took this photograph.

Samaras, Noble and Hersko are also telling stories about an absent subjectivity, but while Hersko uses this as an occasion to make a statement on the belatedness of woman's place in polar narratives and a lost or obscured perception, [Fig.1] Samaras's interest is more in creating a new aesthetics about daily life and survival in these unearthly neo-liberal institutional settings. Thus, her aesthetics, compared to both Noble's exuberant conceptualism and Hersko's sensuousness is extremely spare and pared down, though she does employ an emotionality to convey an informational richness in her work that differentiates it from more reserved dead-pan photographic practices. Neither of the artists' works can be simply folded back into a conventional discussion of the sublime or politics. All three are engaging these regions in new ways by searching for alternative narratives and aesthetics in the very dramatic contemporary situation of climate change without falling into the old heroic/melodramatic tropes of the sublime.

Hersko does this specifically by drawing comparisons between two holocausts to move us away from the purely visualizable as the basis for knowledge. Consequently, none of these artists offer the unimaginable scale that we associate with the sublime, and instead each plays off the epic quality of these male heroic narratives and images. Hersko's, Noble's and Samaras' viewpoints suggest some important new directions in contemporary art, and in the process, their work makes us think about how feminist perspectives have contributed to making us think critically about the conservative apocalyptic versions of the contemporary sublime and a kind of neo-liberal aesthetics that is at the heart of current discussion in climate change, art history as well as Arctic and Antarctic discourses. Viewers' aesthetic experience of their work is not just about landscape, the masculinist heroic subjectivity but also subjectivity itself, be it male or female since their narratives are about rethinking a landscape that is on the verge of disappearance due to anthropogenic pollution. One can only imagine what could happen if they, or other artists in their wake, bring this transformed aesthetic sensibility to other contemporary sites undergoing environmental degradation to examine how it is often in the spaces that we cannot see or know where history, aesthetics and climate politics intersect and collide in the most compelling of ways.

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CONTEXT MACHINES: A SERIES OF AUTONOMOUS SELF-ORGANIZING SITE-SPECIFIC ARTWORKS.

Benjamin Bogart & Philippe Pasquier

'Context Machines' are a family of site-specific, conceptual and generative artworks that capture photographic images from their environment in the construction of creative compositions. They are produced in an art-as-research practise at the intersection of generative arts, and cognitive theories of creativity and dreaming. They invite us to reconsider what is essentially human, and reflect on our constructed conceptions of ourselves.

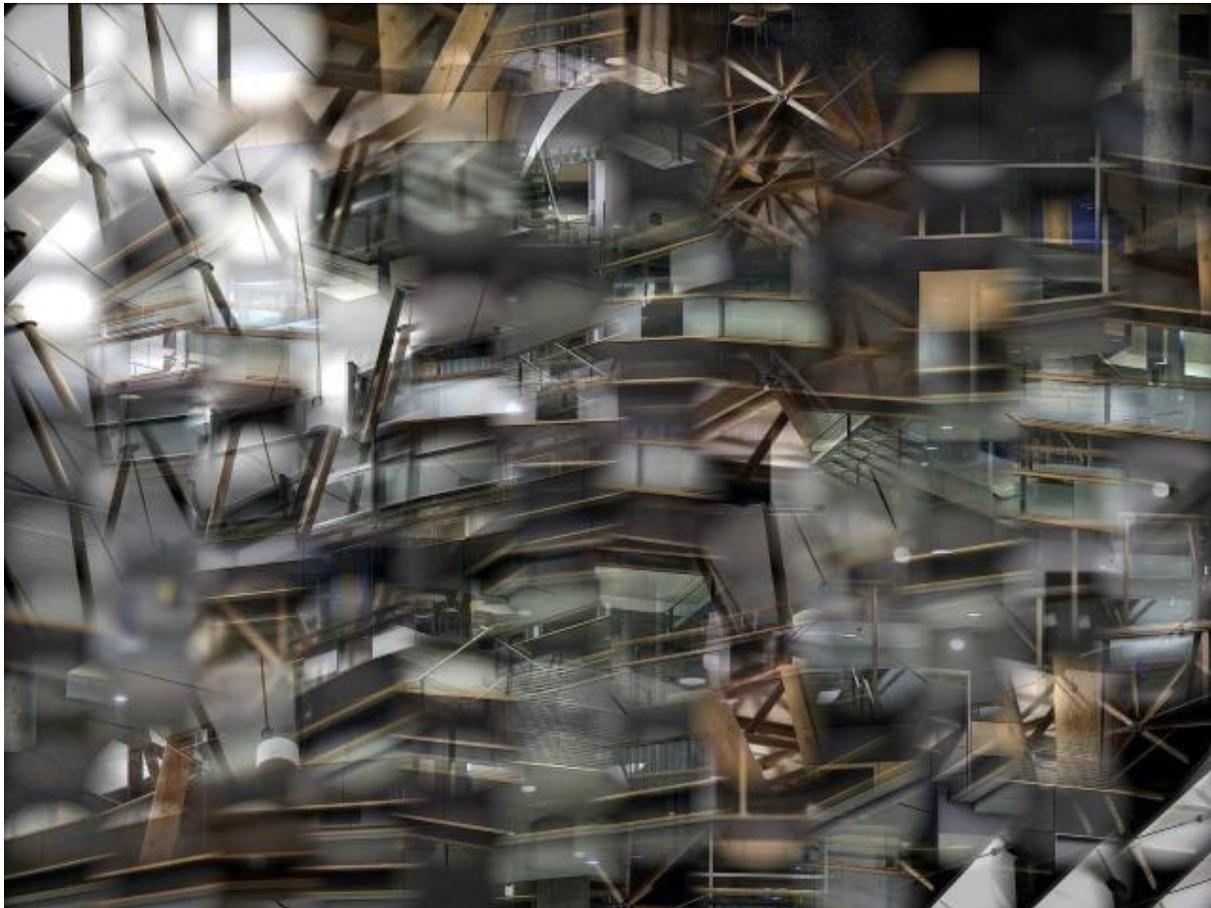


Figure 1: Sample of a memory field resulting from MAM's integration of sense patterns.



Figure 2 : Frame from an associative sequence occurring during the Elektra exhibition.

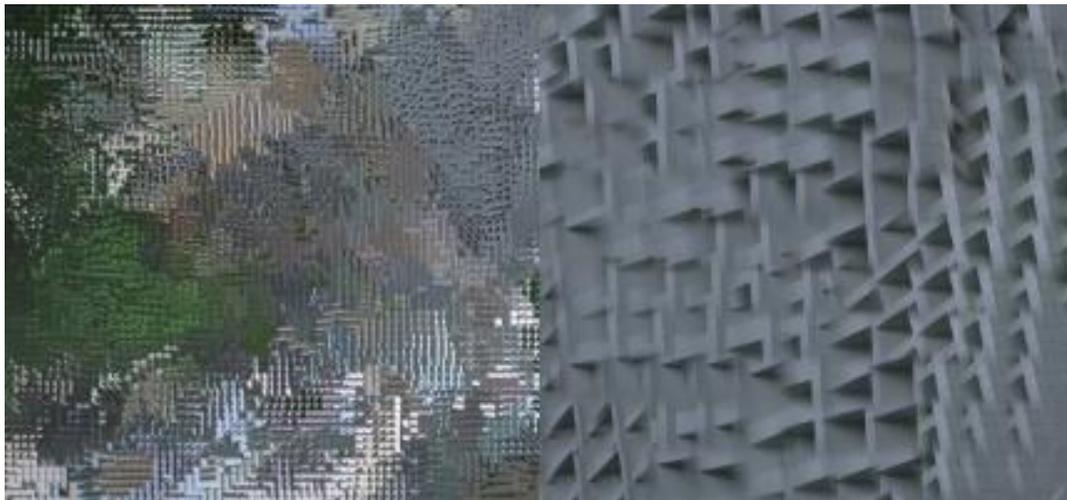


Figure 3: 'Self-Organized Landscape #12' (Hong Kong), 2009 (View from Overpass: Study from Video)

1 INTRODUCTION

Context Machines (CMs) are generative artworks (GAs) inspired by models of memory and creativity drawn from cognitive sciences. A central motivation is the creation of systems whose output is, to some degree, surprising to the artist. The CMs' creative behaviour is manifest in the generative representation presented to the audience. CMs are image-makers, and the process by which they generate images is of

equal or greater significance than the images themselves. Cohen [1] describes the relevance of cognitive processes in image-making:

An image is a reference to some aspect of the world which contains within its own structure and in terms of its own structure a reference to the act of cognition which generated it. It must say, not that the world is like this, but that it was recognized to have been like this by the image-maker, who leaves behind this record: not of the world, but of the act.

The CMs share a number of core features: they all involve a computer controlled camera, used to collect images of their visual context, and use computational methods to generate novel representations. 'Resurfacing' [2] is a precursor to the cognitively inspired CMs, and is discussed to illustrate the transition between the overtly interactive artworks produced before 2006 – where the viewer's behaviour is integral to the work – and the emphasis on autonomy that informs the cognitively oriented CMs. 'Memory Association Machine' (MAM) [3] is an explicit application of the Self-Organizing Map (SOM) [4] and Gabora's theory of creativity [5]. The integration of these processes results in associative sequences of images captured from the immediate environment. This is the central contribution of this work and is further developed in the 'Dreaming Machines': 'Dreaming Machine #1' (DM1) and 'Dreaming Machine #2' (DM2) refine the method that generates associative sequences and frames them as machine dreams. During the day, associations are initiated by images in the world, while at night they are randomly activated and implicitly reference Hobson's [6] conception of dreaming. 'Self-Organized Landscapes' (SOLs) are high resolution print collages that reflect the SOM organization of thousands of pre-recorded images.

2 BACKGROUND

CMs are characterized by features consistent with conceptual, site-specific and generative art practises. In conceptual art, the idea is of equal or greater importance than the object. Both conceptual art and GA have a strong emphasis on process over object. Conceptual art includes 'instruction' works where the artist provides a recipe for the construction of an artwork. These works are highly analogous to GAs, where the artistic concept is encoded in software instructions and executed by the computer. Site-specific art locates the meaning of an artwork in a specific social, historical or physical environment. For Kwon, a site-specific artwork gives "...itself up to its environmental context, being formally determined or directed by it" [7]. The CMs automate this task by literally capturing images of the environment, and using them as raw material from which to generate their own representations. GA is a niche within the broader context of electronic media art, a contemporary art practise at the intersection of technology and cultural production. For Whitelaw [8], "[n]ew media art self-consciously reworks technology into culture, and rereads technology as culture."

Gabora's conception of human creativity [5] enables 'Memory Association Machine' and 'Dreaming Machines'. The theory focuses on the generation of creative ideas rather than their evaluation. Gabora considers creative thinking a form of highly controlled association between memory components. A chain of many small, and perhaps obvious, associations can lead to surprising and creative results. The CMs' ability to organize diverse visual images is enabled by the SOM Kohonen (2001), which models a topological and content-addressable memory field analogous to the 'conceptual space' in which Gabora's creative associations occur. The SOM is an unsupervised AI technique where many simple units organize input patterns by similarity. The details of the SOM, as it is implemented in MAM, is discussed by Bogart [3].

3 RESURFACING

'Resurfacing' [2] integrates generative and interactive components. The artwork autonomously explores its visual context and collects images that are stored in a navigable structure. The installation is composed of two screens housed in an architectural facade, and a computer-controllable video camera mounted to collect images from outside the gallery. The system is initiated with twenty manually selected camera positions. The frames resulting from these positions are 'moments' indexed by the pan, tilt and zoom of the camera. Over the course of the installation, the camera continuously captures images as it cycles through these moments. The right screen shows a live video feed from the camera, while the left screen presents a collage of moments. The camera position (pan/tilt/zoom) is mapped to on-screen parameters (x/y/scale), resulting in an image that approximates, due to lens distortion and a lack of precision, the spatial relations between moments in the physical context. As the camera position changes, the collage translates and scales to match.

Sustained touch on the right screen results in a hole opening, at the contact point, that reveals corresponding images from earlier in time. As the viewer runs her fingers over the display, up to five layers of images, from the increasing past, are shown. Each moment is annotated with a 'value', calculated during each touch event, that reflects the relative number of contact events that occur while the moment is on screen. Each time a moment appears, its value is compared with a threshold. If the value is below the threshold, then a new random camera position will take its place during the next cycle. The value system ranks moments in order to replace low value moments with new and potentially interesting ones.

'Resurfacing' aims to facilitate the viewer's examination of aspects of the world to which she may be habituated. The machine's gaze is strikingly different than a human's. It tends to focus on visual items that are often ignored, providing a representational surface through which to encourage curiosity and exploration of the world.

4 MEMORY ASSOCIATION MACHINE

'Memory Association Machine' [9] (MAM) consists of three screens and a computer-controllable video camera. The left screen is a live video feed from the camera, and corresponds to the current stimulus. The middle screen (Figure 1) presents the system's memory field – the memory field that results from the SOM. The right screen presents MAM's associative sequence through collected images. Each screen presents one of the three processes that define MAM's behaviour:

(1) 'Perception' captures images from the visual context. The camera's gaze is driven by random pan/tilt values. For each associative sequence, the camera moves to a random position and one image is captured. Each image is sub-sampled to 40×30 pixels and fed to the 'integration' process as a vector of RGB values.

(2) 'Integration' organizes captured images into the memory field, as enabled by the SOM. The middle screen shows the memory field where each node is represented by its corresponding image (Figure 1). To emphasize the content of the images – and de-emphasize their arrangement – Gaussianoid alpha channels are used. The SOM is continuously training in its attempt to learn the structure of the world. Due to the finite number of memory locations, and the complexity of the world, the SOM will never converge at a stable topological representation that perfectly reflects the structure of the world.

(3) 'Association' sequences images from memory and is enabled by an independent network of units that mirror the arrangement of units in the SOM, such that each unit is linked to a corresponding image in the memory field. When a new input stimulus is presented to the SOM, the most similar image from memory is activated (presented on the right screen) and becomes the basis of a new associative sequence. The activation of an association unit results in the propagation of that activation to its neighbours to a lesser degree and after a random delay.

Each image is presented on screen with an opacity, and for a duration, proportional to the degree of activation. The sequence is complete when the degree of activation falls below a threshold. The camera chooses a new random direction and a new image initiates another associative sequence. The length of these sequences is an emergent result of the interaction between the current image and the memory field. Reactivation is restricted by an inhibitory model that prevents already activated memories from being selected. At night, MAM ceases to capture images, and association units are randomly activated. This corresponds to the random PGO activation of brain regions that result in dream imagery, according to Hobson's AIM model [6].

'Memory Association Machine' uses a novel combination of a SOM and Gabora's theory of creativity to generate associative sequences of images. These images are collected from the visual context and represent the sum of the system's experience. MAM's random night-time associations inspire 'Dreaming Machines', in which sequences are framed as machine dreams.

5 DREAMING MACHINES #1 AND #2

'Dreaming Machine #1' (DM1) and 'Dreaming Machine #2' (DM2) (Figure 2) refine the associative process initiated in MAM. DM1 is a prototype and uses the same video camera as in MAM installations. In DM2, the video camera is replaced with a digital still camera on a computer-controllable pan/tilt mount. Both 'Dreaming Machines' use a single screen that presents a fusion of the memory field and the associative sequence. DM1 and DM2 manifest the same process and only differ in hardware and installation details.

In one installation of DM2, for the Elektra festival, the camera is mounted on the second floor and looks over the street below. The associative sequence is projected on a large display in the lobby. The display shows the current activated memory in the centre, surrounded by its eight immediate neighbours, all masked with a Gaussianoid alpha-channels and overlapping fifty percent.

Whereas the camera in MAM was driven by random pan/tilt positions, the DMs use a random walk to trace the camera over the visual field. In the DMs, images are not sub-sampled and fed directly to the SOM, but are abstracted into RGB histograms. As demonstrated in the 'Self-Organizing Landscapes' (Section 6) the histogram is sufficient when used on unconstrained real-world images.

In MAM, memory activation is similar to dropping a pebble in a pond – energy is propagated in every direction. This results in an extremely dense and complex network of associations. In the DMs, an activated memory propagates only to its most similar neighbour. The strength of the activation decays proportionally to the degree of similarity between memories. Similar memories are visible for shorter periods, while dissimilar memories are shown for longer periods. The temporal inhibition, used in MAM, is replaced with memory specific inhibition where a memory will only be activated if its reference is not in

a ring-buffer that stores previously activated memories. These refinements result in sequences that progress smoothly through individual associations [10].

An aesthetic weakness in MAM, DM1 and DM2 is that the SOMs never achieve a topological representation of the world. In ‘Self-Organized Landscapes’ the SOM is applied to a finite number of images where memory fields properly reflect the topology of the input images.

6 SELF-ORGANIZED LANDSCAPES

Due to their topological arrangements, the ‘Self-Organized Landscapes’ (SOLs) are the most faithful application of the SOM among the CMs. The bulk of SOLs are constructed from video frames captured on a hand-held HDV camera. Figure 3 shows an example SOL comprised of approximately 10,000 video frames, arranged in a euclidean lattice, overlapping fifty percent, where each is masked with a Gaussianoid. The SOLs directly apply knowledge attained through the development of previous installations.

7 FUTURE WORK AND CONCLUSION

Current research is focused on ‘Dreaming Machine #3’ where production will move away from notions of creativity in order to explore implications and qualities of explicitly implemented cognitive models of perception, memory and dreaming. SOLs are large, and topologically correct, representations and are ideal ‘memory fields’ for the associative process used in DM2, resulting in ‘Dreams of Self-Organized Landscapes’. Another project would construct a SOL from images collected live from the context of installation.

CMs are artworks whose generative representational processes are inspired by images captured from their contexts of installation. Little research explicitly implements cognitive models of memory and creativity in artworks that learn from the world. These works encourage us to see the world anew through a reconsideration of art, perception, memory, creativity and dreams. The artwork is meant to be a public discursive interface for questions such as: What are crucial aspects of creativity and dreaming and can they extend to animals and machines? What aspects of humanity are not represented in AI systems and cognitive models? What is lost if we accept strict scientific conceptions of mind? A machine that creates and dreams is a reflection of our, perhaps misguided, conceptions of ourselves.

8 ACKNOWLEDGEMENTS

The authors thank the Social Science and Humanities Research Council for supporting the research that lead to MAM, and future work on DM3. DM1, DM2, the initial SOLs and ‘Resurfacing’ were produced thanks to support from the Canada Council for the Arts. ‘Resurfacing’ was produced in collaboration with Donna Marie Vakalis.

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JOURNEYS IN TRAVEL – AN INFINITE DIGITAL DATABASE FILM PROJECT

Christin Bolewski

This is a report on a practice-based research project that investigates contemporary modes of non-linear and recombinant digital storytelling based on algorithmic computer-controlled systems. The video installation 'Journeys in Travel' is a story of travel and investigates relationships between travelogue, cinematic essay and digital database narrative.

Decades after its original promotion, the development of nonlinear narratives remains still an intractable topic, because there is often a gap between artists' radicalizing innovation and audiences' quite different expectations. The database video installation *Journeys in Travel* aims to establish its own unique setting amongst the multiple approaches towards nonlinear narratives by addressing this issue. Lev Manovich suggests that "one of the challenges in creating database films is to come up with narratives that have a structural relationship to database aesthetics." [1]

"Journeys in Travel" suggests that:

1. The episodic structure of cinematic essay is a suitable adoption for database aesthetics, which can be called accordingly a "database essay."
2. It is also important to consider film rhythm and the viewers' cognitive and emotional engagement in the narrative construction. Watching a film can be an absorbing emotional experience, but how can this be achieved in database film?

"DATABASE ESSAY"

Cinematic essay is an experimental film form characterized by a collage of associative and subjective reflections on a set theme intertwining different streams of episodic narratives in a mixed genre of narrative, documentary and experimental filmmaking. It emphasizes theme over plot and the discovery of narrative through a flexible, reflexive and self-critical approach.

Paul Arthur writes in *Essay Questions*: "Essays are distinctly process-oriented: they are rhetorical journeys in which neither an exact route nor final destination are completely spelled out. The essay assumes that what it tells us, and the order in which it is communicated could have taken an entirely different route, that it is one of several possible versions of the same concept." [2]

Likewise, the travelogue is an open, episodic narrative; it often brings together scenes without regard for plot or narrative progression. Travel itself can be understood as the reading of an audio-visual narrative, a sequence of images and sounds of unfolding events, captured while we are moving through time and space.

Hence both cinematic essay and travelogue emerge at closer examination as suitable forms to be connected with database narrative. The viewers' expectations are directed towards a film genre that does not offer cause-and-effect structure of classical Hollywood cinema or the problem-solution approach of Griersonian documentary. They are attuned towards a complex episodic narrative, which affords intellectual engagement by following a discursive argument.

Journeys in Travel is a temporary, open-ended arrangement, which sets in motion a seemingly endless chain of references to related topics: Travel, foreign places, tourism, ethnography, movement, pace, rhythm and the relationship of film (structure), narrative and travel. The Open Source Software *Pure Data* (PD), a real-time music and multimedia environment mainly used to create live-algorithmic musical improvisation and (interactive) music composition, controls here an infinite audiovisual narrative.

DATABASE FILM AND FILM RHYTHM

What makes a film finally successful in moving the spectator is film rhythm; how everything comes together and puts the viewer into a ride and flow through different emotional stages. Film rhythm is an essential feature of film, but very complex to analyze, since it is achieved through the final balance of all elements of a film. One rare example of recent research in film rhythm drawing onto cognitive and neuroscience is Karen Pearlman's *Cutting Rhythms: Shaping the Film Edit*.

"The functions of rhythm are to create cycles of tension and release and to synchronize the spectator's physical, emotional, and cognitive fluctuations with the rhythms of the film. By modulation of somatic tension and release, rhythm impacts on the spectators as a generative aspect of their acceptance and comprehension of a film." [3] Later Pearlman continues: "It doesn't matter if the film is a thriller or a romance, narrative or abstract or a film, which might rely on a more directly visual, aural, or kinesthetic mode of tension and release; the editor works with the "life of the object visibly recorded in the frame" to determine the timing, pacing, and trajectory phrasing of its movement, and spectators' bodies respond to this rhythm." [4]

But how can this response be achieved in a database film, where a custom software edits movies in real time by choosing elements from the database using a set of rules given by the author?

NARRATIVE STRUCTURE OF "JOURNEYS IN TRAVEL"

One of the major challenges of *Journeys in Travel* is to set the computer algorithm in such a way as to create a stimulating intellectual and emotionally challenging experience for the viewer without causing boredom or frustration. The algorithm shall keep a balance between well-directed narrative and randomness, and also adjust rhythm and pace to the condition of the human perception so that the timing of the narrative units and the frequency of alternations stimulate the attentive and emotional potential of the viewer.

Journeys in Travel suggests using "micro" and "macro" narrative structures. "Micro structure" refers here to the structure of pre-edited narrative sequences, which offer different perceptive qualities, and "macro structure" to the computer algorithm, which alternates these pre-edited clips into a stimulating audiovisual flow. The term "macro narrative" structure is – in this case – derived from "macro-aleatoric" chance-based music composition. Aleatoric music composition supports structure but also variation within structure, it is determined by elements of chance or unpredictability. "Macro-aleatoric" is a principle in European composition of the 1960s, which uses a "modular structure of musical units that can be combined using a set of rules given by the composer." [5]

Within the “micro structure” of the separate narrative units traditional methods of film montage such as continuity editing are applied to create miniature narrative structures and subplots, for example, a documentary observation, an anecdotal travel report, a philosophical quote, or an experimental audiovisual stream, which can then be flexibly arranged in the “macro structure.” Therefore each narrative unit within the database provides a type of conclusion and rhythmic structure that can be read against the content of the following or previous units. The computer algorithm controls the pacing and timing within the “macro structure”. Pacing and timing within the individual sequences is set through the prior editing process of the separate sequences and typical narrative devices such as commentary voices and musical leitmotifs establish reoccurring subplots and themes to support the episodic and rhythmic structure of the ongoing narrative.

The experimental mixed genre form of cinematic essay allows the creation of narrative, documentary and experimental film sequences of different aesthetic, intellectual and emotional capacity. Each sequence is then classified into one of five different genre categories, which are organized within the structure of PD as five separate video and sound players. These players alternate according to a pre-programmed script to generate a rhythmic flow of associative narrative chains with an alternation of different perceptive qualities and varying intellectual, visual and auditory stimulus for the viewer. The five narrative groups offer:

1. Philosophical and sociological reflections for the intellectual stimulation of the viewer. These clips are aligned by audio commentary providing a discursive argument.
2. Intertitles, which interrupt the cinematic flow and provide additional text information and intellectual stimulation.
3. Visual travel narrations and observations. These clips frequently use a camera in motion gliding through foreign landscapes creating an effect similar to early “phantom rides” and are often aligned by an anecdotic commentary and musical leitmotifs.
4. Experimental clips with experimental manipulation of image and sound, which are often accompanied by musical leitmotifs. These clips provide a high visual and auditory stimulus for the viewer.
5. Documentary observations with slow paced or static camera, which provide the opportunity for the viewer to observe people, places and action more independently by avoiding additional commentary and interpretation.

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ALTERNATIVE APPROACHES TO REPRESENTING KNOWLEDGE IN THE HUMAN ENVIRONMENT

Lee Boot, David Gurzick & Stacy Arnold

How is knowledge represented in the environments that surround us? What messages are best promoted, most compelling, or most sophisticated? The impact of our knowledge environments is becoming more apparent as economies become increasingly information-driven and facing our global challenges relies on reliable knowledge. On the scale of the individual, knowledge environments influence the thoughts and feelings that we act upon.



Fig 1. Still from the film, Euphoria. A neuron chandelier is hung from bridge in Baltimore. Copyright 2008, Making Euphoria, LLC



Fig 2. Screen shot from Fieldtrip showing access to films, filmmakers and discussion. Copyright 2007, InfoCulture, LLC and UMBC

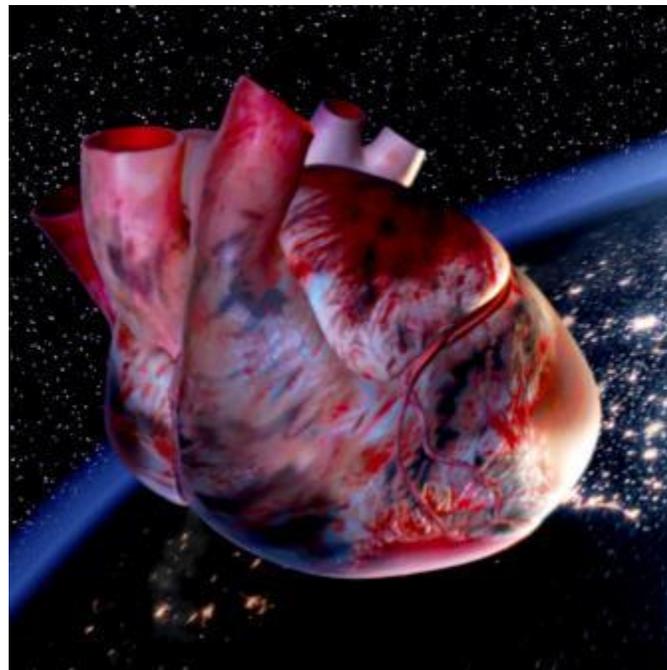


Fig 3. Screen shot from SpeakHeath showing a film about community and cardiovascular health. Copyright 2009, Lee Boot and UMBC

So much of what a civilization does, internally and externally, is defined by how it handles information: the degree to which it is controlled, the emphasis placed on discovering new knowledge, and ultimately how knowledge becomes embedded cultural wisdom.

Historically, civilizations have produced special artifacts to contribute to building culture from key knowledge they (usually, their leaders) believed was essential. The ideas of the Catholic Church were famously promulgated by the art and architecture in Florence, and the sand paintings of the Navajo people of North America express spiritual ideas that form core beliefs of their culture. In the present-day United States, however, the two best funded, most visually arresting and ubiquitous informational artifacts are not intended to increase cultural wisdom. Instead, commercial advertising and entertainment share the purpose of producing revenue. Social psychologist Albert Bandura's social learning theory advanced our understanding of how signals embedded in people's environments impact individuals' beliefs, attitudes and, ultimately, behaviors. [1] With their ability to dominate the public messaging environment, commercially motivated interests purchase determinant influence on social norms. Advertising in the US is a \$400 billion a year industry. For over one hundred years it has employed not only highly skilled message and image-makers, but psychologists, anthropologists and more recently, neuroscientists, to produce highly sophisticated persuasion schemes. [2] These have had a cumulative, synergistic effect on socially normal beliefs and attitudes that many believe is out of line with wisdom. [3] In contrast, media that could contribute to valuable cultural knowledge is severely under-resourced. Hollywood films routinely cost 1,000 times as much to produce as educational programming (\$100 million, versus \$100 thousand per product). Broadcast venues have been commercially controlled, leaving negligible room for social concerns. Even when educational or prosocial programming proves to be commercially successful (as was the case with the well-known 1977 television series *Roots*, or producer Norman Lear's series *All in the Family*) the industry eschews socially motivated endeavors. [4] Such commercial control of the airwaves sets the US apart from other developed countries from Britain to South Africa to Nepal, where governments reserve significant parts of the broadcast spectrum for prosocial and educational programming.

The proliferation of inexpensive, high quality production tools and the open venues of the Internet and mobile networks now allow alternative and valuable information artifacts to be created and to enter the cultural discourse. Evading both state and commercial attempts to control or bury them, such artifacts can ignite political change and also serve the quieter mechanisms of cultural evolution such as the slow growth of common wisdom.

For over ten years, transdisciplinary collaboration between the Imaging Research Center at the University of Maryland, Baltimore County, the media research and development firm, InfoCulture, LLC and other researchers from the US and Canada has led to experimentation with new forms of knowledge to test how contemporary media tools and venues might best be used for social goals. Each of the three projects described below is aimed at learning how to engage a population in knowledge that might help them improve their health, education and wellbeing.

Euphoria

Like nearly everyone, young people want to feel as good as they can for as long as they can. They want to know how to survive and thrive emotionally. In the US, despite that the pursuit of happiness is a founding ideal, young people are typically provided little knowledge of what helps the brain sustainably

produce chemical rewards. Neuroscience and psychology literature as well as the experience of psychiatric clinicians support that when a person commits to the pursuit of meaning and engagement as a way to achieve the most positive emotional states, the euphoric effect meets or surpasses that produced by mood altering drugs or adrenalin-producing high-risk behaviors, but also is sustainable. However, for lack of that wisdom prevailing in socially normal thinking people engage in more destructive pursuits - a problem that has increased human suffering and plagued societies around the world for decades or longer.

To find a way to engage young people in considering the pursuit of meaning and engagement, the US's National Institutes of Health funded *The Euphoria Project*. Artists and filmmakers worked with neuroscientists to develop content. It became clear that profound discoveries that had been made about the brain had not entered mainstream thought from which young people were taking cues. Specifically, in addition to the neurochemical rewards of pursuing meaning and engagement, such a pursuit and the rewards it supplies feed off each another in a feedback loop - suggesting to young people that the effort they might expend will be multiplied when returned. Further, the sheer power, complexity and beauty of even a single neuron firing, combined with the astronomical number of connections in the brain is impressive knowledge that could build self-efficacy (one's belief in one's own ability to accomplish and objective). Especially when combined with information about neural plasticity - the concept that a brain grows and changes to increase its ability to face new challenges.

The story seemed strong, but to learn more about how to tell it in a way that might cause young people to engaged with it, researchers chose to represent the knowledge in a feature film, but to abandon the structural conventions of educational and informational media designed to be clearly understood in real time on the first screening. Instead, the new experimental design would be informed by structural concepts found in celebrated works in all the arts - works that have historically engaged audiences and become culturally significant. It would use aesthetics, analogy, ambiguity and authenticity - what the team came to call the 4 As, to compel audiences to reflect and discuss the work to understand it - thus facilitating more personal connection to the ideas in the film. The experimental structure would juxtapose a stream of visual metaphors - three-dimensional sculptures and tableaus built on urban and rural landscapes, against a narrative that wove together some of the neurobiology, social psychology, anthropology and history related to the pursuit of happiness. In one scene, we see a man standing on one leg, constrained by a big box he is wearing and surrounded by the outline of a head drawn in metal pipe. At the same time we hear dialog about the neural basis of depression. In another scene, multicolored clay feet are dropped, one at a time, into a pool of clear blue water where each releases dye which all combine into polychrome clouds that form abstract designs. All the while, the narration discusses the negative impact cross-cultural traumatic conflict can have on an individual's ability to pursue happiness. The narrator himself, rather than appropriating conventional host's garb, wears copper colored, bejeweled shoes and often appears in only his underwear. The incongruity of these juxtapositions plays out for viewers, mostly unexplained. Researchers gambled that it would be better for the film to confuse the audience than be didactic, unimaginative or condescending. The objective was to give the audience something they could not dismiss with easy categorization or predictability, and thus good engage in open-mindedly.

A randomized, controlled study of the film's effect on 500 high school students found that students who saw *Euphoria* were able to make the connections necessary to understand the content, and reported liking the film more than those who saw the sham film, *Storm Chasers* reported liking that film. Perhaps most interesting was data from a follow-up survey that showed that the beliefs and attitudes of students who only saw the sham film had shifted toward the ideas in the presented in the *Euphoria* film,

suggesting as the only plausible explanation that the film initiated a social discourse. Though an experiment, *Euphoria* was accepted into several national film festivals, winning a gold award at the Houston International Film Festival and garnering a substantial amount of praise in the press. Most important, the film showed that the conventions of informational and educational media could be replaced by a more artistic approach and be more effective as a result.

Fieldtrip

Online and mobile technologies don't just change the ways we do things; they change what things we can do. Fieldtrip is a research project that explores how to best leverage today's portals and venues of communication to provide a specialized social network where teenagers can engage one another in discussions about their thoughts about and feelings toward education. Developing such a discourse on the contemporary technologies that are woven into students' lives outside school, in environments where attitudes about education often form, is something that was previously unaffordable for educators and school systems. In the past, motivational issues had to be addressed by parents, or in school. Of course, young people use these technologies to connect with one another, not with adults. Accordingly, Fieldtrip is based on literature supporting the promise of peer mentoring and peer support to deal with a range of issues.

Researchers used \$20 iTunes gift certificates as incentives to recruit a population of 14-19 year-olds to join an online community. Members supplied assent and parental consent forms and filled out an online survey about their attitudes toward, and achievement in, school in order to establish baseline data from which to measure potential changes. One another's real identities were unknown to recruited members. Instead, new online identities were begun as members created screen names by combining three words from a large list (resulting in names such as *FreeSushiCasserole* and *TheWildRose*). To prompt dialog on the site, 2-3 short films were posted each day. They were personal video journals made by high school-aged filmmakers. They documented the impact that family, peer and internal struggles were having on the filmmakers' orientations toward school. Through members' written comments, a dialog emerged among community members that would be analyzed to assess the project's potential for shifting members' educational motivations. (Members were not required to watch the films or comment in order to get their iTunes voucher).

The project posed two key challenges: First, to integrate the expertise of adults in order to make the films compelling enough for teenagers to elect to watch, without losing the fact that these were authentic teenage voices. Second was the problem of moderating and facilitating the discussion without distorting it. These questions lie far beneath the veneer of the technologies that made the project possible and reflect the larger, historic question: What is the most constructive relationship between young people and adults in situations where adults are trying to encourage growth?

Professionals mentored the young filmmakers and edited their footage to increase production value, but this expertise was invisible to most people because the faces and voices viewers saw remained those of teenagers. [5] Near-peer-aged, college students of psychology moderated the discussion, chosen with the hope that they could be sensitive to the need to preserve the adolescent-owned character of the discussion but move them forward in constructive directions. [6] Thus, the perception that teenagers controlled the site was maintained.

During the month-long pilot, hundreds of comments by community members accumulated. Analysis showed that the content of comments mapped well onto motivational literature: These were the kinds

of discussions that could affect teens' ability to succeed at school. Modifications to the interface of the site and moderation practices were made for a second pilot, and helped further orient community members to the messages in the films, increasing the adolescent engagement in discussions, suggesting self-reflection and the development of beneficial self-perception had occurred. The next step in the research is to scale the online community to reach a wider teenage public and keep it open indefinitely.

SpeakHealth

The US spends more on healthcare per capita than any other nation and is home to some of the greatest advances in medicine and medical technologies, yet the health of US citizens is ranked 37th in the world. [7] The primary cause of this problem is destructive behaviors such as eating habits and a sedentary lifestyle, rather than a lack of available care. It is clear that people are acting in ways they know will hurt them. Further, commercial messaging aimed at selling potentially harmful consumption is unlikely to be significantly countered by more helpful messages. Could an online public discourse infuse common attitudes with new ways to think about health and tilt the balance back toward more constructive social norms?

That was the research question driving the *Speakhealth* project. Like the *Fieldtrip* project, the effort would build discourse with media. This time, however, experts would be a very visible part of the mix. To develop content, a transdisciplinary team of medical practitioners, artists and social media producers created three extensive graphic information maps: the first of constructive health ideas, the second of US cultural traits that might facilitate or undermine the adoption of those ideas, and the third of potential co-mission groups. Content emerged when lines were drawn across the three maps, linking ideas with cultural traits and potentially supportive groups. It was decided that the most supportive initial group was likely to be health professionals themselves. The hope was that they would then spread the ideas through and beyond their own networks. Given the modest budget of the project, media that was edgy and improbable would be used to draw attention. A similar strategy had worked in the *Euphoria* film, and in the Truth anti-smoking campaign sponsored by the Legacy Foundation (thetruth.com). That effort also used unusual, extremely sarcastic and imaginative online films and is credited with 22 percent of the decline in young adult smoking from 25.3 to 18.0 percent between 1999 and 2002. [8]

The website was launched with a talk at a major integrative health conference in front of doctors and other healthcare practitioners. Reaction was extreme and mixed. While some in the audience were enticed, many found the films disturbing. One film presented an enormous computer-generated, though very real-looking human heart orbiting the earth, which then entered the atmosphere and slammed into a suburban cul-de-sac, bouncing nearby residents out of bed and leaving their traffic circle in flames. The short film was intended to introduce the site's visitors to research findings indicating that a sense of community, something US suburbs often struggle to establish, is significantly correlated with improved cardiovascular health. [9] The audience did not expect to see such departures from the norm. Over the following six months, the *Speakhealth* project built an active online community. It was clear that the most controversial and/or imaginative media created the biggest draw. However, the project's research sponsor, an independent integrative medicine organization, became fearful that this media would harm their funding support and alienate some colleagues. Rather than allow the sponsor's organizational needs to redirect the project in ways not supported by literature and experience, the research team chose to end the project.

As the projects described above indicate, the opportunities for social progress offered by unprecedented access to mass audiences provided by new media and communication technologies are only beginning to be understood. A great deal seems possible, but research is necessary to test new approaches.

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A RESPONSE TO LIFE'S EMERGENCIES: BIOARTCAMP AS TECHNIQUE OF ATTACHMENT TO LIFE

Marie-Pier Boucher

This paper addresses the contemporary 'biologization' of life generated by recent acceleration of technical performances. Drawing upon *BioARTCAMP*, I reflect upon a method for thinking about the possibility of attaching ourselves to life. By referring to the notion of camp as an architectural concept, I offer a critical analysis of the biotech future in terms of a spatial technology.



Jennifer Willet, BioARTCAMP: A Rocky Mountain Adventure in Art and Biology, hosted by INCUBATOR Lab at The University of Windsor, and The Banff Centre, Banff National Park, 2011.

Participants: Ain Baxter, Marie-Pier Boucher, Zoot Derks, Tagny Duff, Jeanette Groenendaal, Kurt Illerbrun, Angus Leech, Marta De Menezes, Bulent Mutus, Jennifer Willet, Paul Vanouse, Tokio Webster, Grant Yocom, Britt Wray, David Dowhaniuk, Kacie Auffret, and Jamie L. Ferguson.

The war against war will be no camping party. [1]

Hosted by Jennifer Willet from INCUBATOR: Hybrid Laboratory at the Intersection of Art, Science and Ecology in collaboration with the Banff Centre for the Arts, *BioARTCAMP* is an art/science collaboration that took place in July 2011 in the Canadian Rocky Mountains. Bringing together artists, scientists, theorists, filmmakers, and students, *BioARTCAMP* is best described as a camping expedition in the Rocky Mountains where the Rockies served as a camping site for building a portable biological laboratory. *BioARTCAMP's* aim was to reinvent the ecology of biological laboratories. As Willet claims, biological laboratories are often represented as highly sophisticated and clean environments in addition to being perceived as sacred and esoteric spaces reserved for experts and specialists. However, in reality, they are often messy and dirty. As a consequence, their misleading representations generate misunderstandings about the conditions in which science is being done, and prevent public debate surrounding the biotech future. In order to resist these false assumptions, Willet pursued the objective to produce

alternative representations of biological laboratories by connecting their closed ecology to larger ecologies. In the present paper, I will refer to the notion of camp as a spatial concept in order to ask how the opening up of a milieu of interiority, of a closed -or sterile- environment (a traditional laboratory), to an open -potentially infectious- space (a camp-based laboratory), to a milieu of exteriority, a space of indeterminacy, a futurity, a changing potential, affected -or infected- the capacity of *BioARTCAMP*'s participants to attach themselves to life.

Recent acceleration of technical performances has indeed brought life to the fore. Bio-fuels, bio-weapons, bio-materials, bio-diversity, bio-morphism, bio-mimesis, bio-art or bio-architecture – name your own “bio” preference. Circulating transversally, life is today everywhere and nowhere. Seen and said. Smelled, touched, eaten. Addressing the concept of life requires a fine tuning and risky choices, making it both an adventure and a risk. In addition, the proliferation of biotechnology has reconfigured our relationship to it: life is no longer a phenomenon to observe and understand, but a series of mechanisms to reconfigure and transform. According to Henri Atlan, physician, biologist and Professor Emeritus of biophysics, biology passed from a science of observation to a biotechnology: it is now able, like physics and chemistry, to produce artificial living objects, machines of all kinds, and synthetic products. [2] That is to say biology is for him found in the reality of artefacts, in the art of making life.

The integration of the art of making life in contemporary practices implicitly resonates with the possibility to enliven the world. The claim is simple: by making things biological, life will proliferate. Engrained in the cracks of this claim is the idea that, biological materiality carries life's operational form. In other words, contemporary biotechnology generates a “biologization” of life. Literal insertion of biological materials into contemporary practices foregrounds an understanding of these materials as carriers of their own capacity to enliven the world. Often entangled in an engineering paradigm -which finds its point of culmination in the field of synthetic biology whose aim is to engineer life- biological life revives a substantialist conception of life, one based on the assumption that life is found in the physical corporeality of matter. In order to resist the phantasmatic view of a biological, all too biological world, I will proceed to articulate a kind of *a-biological* identity - without albeit negating life's biological mode of existence. I wish to ask how it is possible to resist and criticize the proliferation of biotechnology, its misleading representations as well as the biologization of life it generates, and at the same time facilitate the emergence of new modes of living. I will draw upon *BioARTCAMP* to reflect upon the construction of a method -“less a theory than an account of the conditions of the production of knowledge” [3] for thinking about the possibility of attaching ourselves to the whole of life. Biotechnology has not only brought a biologization of life, the specialization of biology has facilitated a division of biological life: molecular biology, tissue culture, genetics, etc. Thus, attaching ourselves to life implies the ‘discovery’ of life as a whole. In the form of a debriefing after a camping trip, I wish to question how *BioARTCAMP* has succeeded at filling the void left by contemporary biologization of life.

In order to grasp the potential for *BioARTCAMP* to facilitate an attachment to life as a whole, I suggest to understand it in terms of a speculative and experimental project. Speculative in the sense that it does not bring about solutions, but raises problems [4] and experimental in the sense that it presents these problems in the form of alternative futures. In other words, by speculating and experimenting on/with modes of vividness *BioARTCAMP* can be defined as a technique of attachment to the whole of life. While Willet's project concentrates on the technological apparatus proper to the manipulation of life (i.e. the laboratory), I wish to foreground bioart's potential to go beyond the mere subversion of technology and to address life both as a biological and a-biological mode of existence.

ATTACHMENT AS EMERGENCY: CAMPING AS STRATEGY

In *Puissances du temps: Variations de Bergson*, French philosopher David Lapoujade explains the distinction Bergson draws between attention and attachment to life. Attention to life is the mechanism through which we adapt ourselves to the necessities of the world we live in. Attention to life, he adds, is biological: it is both anticipation and adaptation to the external world, a point of tension, which characterizes life's equilibrium, one that maintains a solidarity between psychological life and motor activity. For Bergson, says Lapoujade, intelligence is one of the main forms of inattention to life. Intelligence, he says, is when life becomes external to itself. [5] He adds that even if intelligence allows a greater adaptation to the material world, it is nevertheless a form of vital depression. In response to the negative effects generated by intelligence, Bergson invites us to detach ourselves from representation, which is a product of intelligence, and to attach ourselves to life. In fact, for Bergson, we do not only live by adapting ourselves to the world, but also, and maybe most importantly, by attaching ourselves to life. According to him, attachment to life may take three forms: (1) obedience; commitment to a social group; (2) belief; attachment to a group of supernatural beings, and finally; (3) creation or liberation, both derived from a commitment to the movement of life itself. [6] While the first two qualify closed societies and the creation of worlds reserved to humans, the third form of attachment qualifies open systems and creates a universe, a universe open to a plurality of worlds. For Bergson, the first two are tendencies that circumscribe the circles where human's deploy their humanity and result from the same vital imperative: "to conjure the depressing strength of intelligence, which slows down life's movement." [7] The first two modes of attachment are therefore, like intelligence and representation, forms of vital depression.

The proliferation of biotechnology has brought a fourth form of attachment, a biological form of attachment. A form of attachment situated at the intersection of closed and open systems, of creation and depression. While a biological attachment to life might result in the production of closed systems reserved to biological entities, it also holds the potential to create universes that are opened to a plurality of worlds. The distinction between these two modes of attachments (i.e. triggering creation or depression) is based on the understanding of biotech life; namely the difference between an attachment to the movement of life itself as opposed to an attachment to the forms through which it passes. That is to say, the difference between an immanence of spirit and a transcendence of intelligence. While the Western world has worked towards reducing the capacity for religion to act as its transcendental force of becoming -bringing back a virtual force of immanent appropriation- we ought to be careful at not making biotechnology a new transcendental form ready to govern our attachment to life. The issue at stake is therefore to develop a concept of attachment to life based on an immanent and spiritual processual relationality; a concept of life that recognizes the various beings (biological or not) that compose the universe. The issue at stake is also not to interpret Willet's goal of generating new representations in terms of an intelligible understanding of biological laboratories (adaptation), but rather in terms of a sensuous relation, namely an attachment to the movements triggered and deployed by her project. Up to now, I have laid the conceptual foundations for understanding the possibility of resisting the biologization of life by attaching ourselves to the movement of life itself, to life as a whole. Let me now explore how the notion of camp can trigger such an attachment.

Camp as an architectural concept commonly refers to a state of emergency. *BioARTCAMP* is no exception to that. For Willet, the emergency is based on the necessity to transform, alter and subvert biological laboratories' representations as well as to connect their closed ecology to external ecologies. In other words, Willet invited her guests to create techniques of ecological attachment. For me the emergency lies on the necessity to attach ourselves to the whole of life, meaning the possibility to resist the

biologization of life. From the Latin “campus,” the notion of camp refers to an open field. However building a camp-based lab nevertheless contradicts the idea of an open space proper to scientists who do field research. For instance, Kurt Illerbrun, one of the *BioARTCAMP*'s scientists explained that the spatial delimitations proper to the camp were for him constraints to his normal field of research, which does not rely on specific boundaries. Also borrowed from Old English, the etymology of camp refers to “contest,” to a “place where an army lodges temporarily.” [8] Even though the use of camp as contest became obsolete by the mid of the 15th century. it nevertheless speaks to *BioARTCAMP*. Bioartcampers could indeed be characterized as a soft army, one that aims at fighting against common assumptions about biotechnological development.

In *Camps: A Guide to 21st Century Space*, Charlie Hailey states that “defining the camp is a central problem of our contemporary moment.” Camps, he adds, “result from the exceptional circumstances of conflict, natural disaster, displacement and marginality.” [9] Historically speaking camps are for him no longer regarded as recreational and strategic spatial techniques. Today's camps, he argues, cover a much wider range of areas: experience, trauma, strategy, liberation, creativity amongst other things. For him, contemporary camps can be divided in three -albeit not mutually exclusive- categories: (1) autonomy, which he links to choice and autonomous organization; (2) control, which he explains in relationship with strategic camping areas regulated by systems of control and; (3) necessity, which qualifies spaces of relief and assistance, spaces that are constructed in response to perceived threats, expected hazards or immediate pressure. Following his categorization, *BioARTCAMP* would be situated at the intersection of autonomy and control. Even if *BioARTCAMP* acts as a response to various kinds of threats generated by the proliferation of biotechnology, it cannot be compared to the atrocities that forced people to build camps to ensure their survival – either political, economical, social, etc. (for instance, refugee, homeless and mass shelter camps to only name a few). *BioARTCAMP* was autonomous in its capacity to act simultaneously as a protest camp (protesting against the hegemonic understanding of biotech), an open camp for DIY practices, a hacker camp for hacking dominant representations, a transcamp, which brought together the “two camps” (art and science), and a public camp/open fair that brought the general public to share our experience.

In *What is Camp?* Giorgio Agamben asserts that camp is “the most absolute biopolitical space that has ever been realized” it is “a space in which power confronts nothing other than pure biological life without any mediation.” [10] In so doing, he foregrounds a notion of camp that also generates a biological understanding of life. For him, camps are spaces where states of exception become the rule. *BioARTCAMP*, however, did not function according to the permanence of a suspended rule of law. Quite the contrary all the ethical limitations, which are however best described as moral judgments, have not been suspended during the camping event. *BioARTCAMP* is therefore, unlike other forms of camps (here I cannot not refer to concentration camps), a place where jurisdictions were transgressed and even eliminated. Conversely, *BioARTCAMP* was engrained in juridical limitations that prevented the emergence of an attachment to life. In fact, the biotech-model relies on a juridical conceptualization of power, one rooted in politics of identities, categories, ambiguities and transgressions. A juridical conceptualization that recognizes concrete couplings between livings and livings -in the biological sense (for example humans and cells)- in the light of juridical scales that emerge from the formulation of categories, which in turn reproduce models of power described in terms of hierarchies, domination, exploitation, and transgression. For instance, in the context of *BioARTCAMP* work on vertebrates required ethics approvals while investigations on plants did not; a moral assumption that generated hierarchies and that broke

down the relationship between -or undo the intertwining of- plants and animals. Conducting interviews with human subjects who did not run any “risks” also required human ethics approvals while Paul Vanouse's extraction of his own DNA from his own saliva has been considered a banal action. The latter is engrained in a moral assumption based on a scientific division of life that lands on politics of identities and categories. The point of tension here is the fact that the abstract linkage between life and life conditions, and sometimes determines, their concrete couplings. Thus, by (1) negating the possibility of an ontological equality, and (2) asserting an ontological privilege to an already known -or pre-given- term of the relation, it feels like biotechnology's juridical reality may prevent an attachment to life as a whole. The choice of Banff's National Park as a camping site -a highly regulated area in Canada- therefore presented itself as both a productive and non-productive way of addressing the dominant juridical paradigm within which biotechnology is apprehended. On the one hand, it prevented the suspension of the law and negated the possibility for *BioARTCAMP* to be associated or compared to the horror inherent to certain camps of contemporary human history (for instance, concentration camps). However, it also prevented the possibility to speculate and experiment with the possibility of reconfiguring the moral norms that are established in Canada (and elsewhere).

Even if *BioARTCAMP*'s spatial reality prevented us as participants to reinvent the biotech's regulations, it allowed us to engage differently with the normal course of actions regulated by traditional laboratories. The singularity of *BioARTCAMP* as a space-event was in fact its temporality. The main form of attachment that was foregrounded at *BioARTCAMP* is a temporal form of attachment. By asking participants to commit to two whole weeks, the experimental methodology initiated by Willet was literally an experiment on the mental state of every participant. We indeed not only committed to a social group and to supernatural forces (the stunning landscape, mountains, fresh air, rivers, etc.), we also committed to Paul Vanouse's PCR campfire, DNA and green racoon, to Marta de Menezes's petri dishes, agar and tetrahymena, to Iain Baxter & Louise Chance Baxter's wood mannequin, to August Leech music instruments and lyrics, to Jennifer Willet's multiple samples, to Tagny Duff's microbes, to Kurt Illeburn's caterpillars, to Bulent Mutus's chemical drawings, to the hostel's bunk beds, to our orange vests... We have experienced life as a whole by bringing together the various entities (biological or not) that together composed the camp. Unfortunately, the final detachment was a form of depression for many of us. Nonetheless, *BioARTCAMP* succeeded at demonstrating that biotech is a spatio-temporal technology, one that holds the potential to trigger the experience of new forms of durations by transforming/breaking up the spatial coherence of our usual working places.

By relating biotechnology with architecture my aim was not to avoid the ethical implications raised by contemporary manipulation of life. Conversely, it was a strategy to foreground (1) importance of spatial conditions in conducting research on living entities (sterility, air temperature, filtration, plumbing, etc.) and (2) the fact architecture is a technology that captures and conditions life's motion and that it shall in fact be considered as the oldest form of biotechnology. Accordingly, it was a method for understanding life in terms of a spatio-temporal relationality instead of a bio-physical entity. Hence, relating biotechnology to architecture ought to be interpreted as a technique of attachment to life.

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CROSSING JUNGLE : AN ANALYTICAL AND EXPERIMENTAL APPROACH OF ACTIVATION PROFILES FOR AUDIO-GRAPHIC NAVIGATION IN CLUSTERS OF LEAVES

Marie-Julie Bourgeois & Roland Cahen

This paper presents the work of designers and sound designers. It is an experimental approach, where we have tried to analyse the audio-graphic characteristics of foliage through video and simple 2D and 3D simulation models. Within the project we are working on the concept of activation profile. An activation profile is a simple way to represent active and shaped event triggers.



Fig. 1. Video shots of wind, camera and human body crossing various species of foliages. Marie-Julie Bourgeois, 2010.

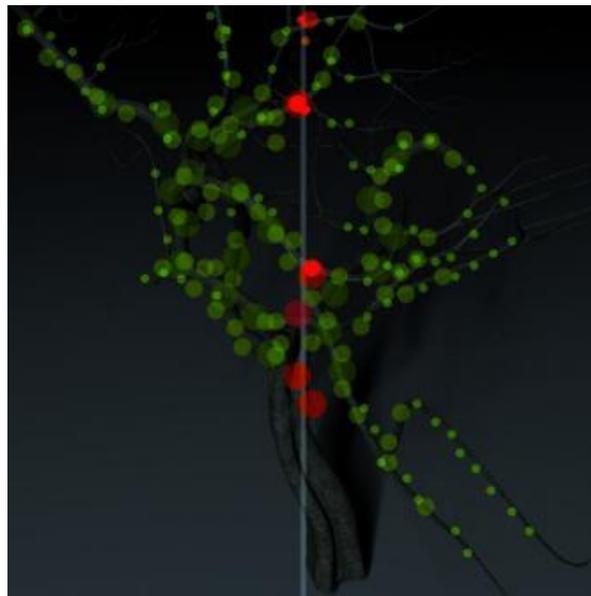


Fig. 2. 2D Interactive scene with a linear activation profile Marie-Julie Bourgeois, 2010.



Fig. 3. 3D Interactive scene with a cluster of points as an activation profile. Marie-Julie Bourgeois, Romain Gora, Roland Cahen, 2011.

Topophonies are virtual navigable sound spaces, composed of sounding or audio-graphic objects. Graphic and sounding shapes or objects are audio-graphic when visual and audio modalities are synchronized. In virtual reality and video games, we know how to make scenes composed of point-shaped elements: graphic and sound (i.e. a spot representing an object). However, there is no tool enabling navigation to make scenes consisting of particularly great numbers of interactive visual and sound elements, nor dispersed elements such as in a crowd, a flow of traffic, foliage or rain. The research project *Topophonie* proposes lines of research and innovative developments for sound and visual navigation in spaces composed of multiple and disseminated sound and visual elements (audio-graphic clusters). By working in a scientific multidisciplinary group (digital audio, visualization, sound design) with enterprises specialized in the domain of interactive multimedia activities, the project *Topophonie* works on models, interfaces and audio-graphic renderings of audio-graphic clusters. The project team is composed of researchers specialized in granular sound renderings and advanced interactive graphic renderings, as well as digital designers and enterprises specialized in the relevant fields of application. The first task of the project was to analyze and formalize several representation models. Foliage is one of them.

This paper is part of the *Topophonie* research project, the aim of which is to navigate within audio-graphic clusters. Clusters are wide ranges of objects of the same class. By Audio-graphic, we mean synchronized audio and graphic object behavior: both modalities have been implemented in a single action. Among the various examples of these kinds of objects, such as rain, flocks, grains etc.

This paper focuses on foliage as clusters of leaves. We have selected two main audio and visual behavior in order to find a good and costless way to simulate: the wind and a first person character crossing the foliage. This paper presents the work of graphic and sound designers. It is an experimental approach, where we have tried to analyze the audio-graphic characteristics of foliage through video, 2D and 3D simulation models with popular softwares. Within the project, we are working on the concept of activation profile. An activation profile is a simple way to represent active and shaped event triggers.

We can illustrate the concept of “activation profile in clusters of leaves” with the body of Tarzan crossing the jungle hanging from a vine.

We needed to be sure that this concept was perceptible. Therefore, we have compared the user experience relative to two different symbolic activation profiles: a point symbolizes the hand of a player and a line symbolizes the wind path in the user experiment.

We concluded with a 3D interactive scene which simulates the audio-graphic navigation in clusters of foliage with different activation profiles.

VIDEO MODELS

Fig. 1. Video shots of wind, camera and human body crossing various species of foliage

These video captures show some audio-graphic characteristics: the vegetal sound due to the collisions between leaves, the plastic sound of the camera, the clothes and flesh sound of the human body, and the graphic behavior of the different species of plants during and after the crossing movement.

It is difficult to be in conditions where the wind blows strongly on the foliage and where the microphone is not affected by the storm. For the passage of the camera object through the foliage, the microphone itself and the plastic case of the camera interferes when colliding with leaves and branches and creates some mechanical and metal noise which appear out of context. A completely soundproof cage was rather complex to realize.

Nevertheless, the use of a body organ (hand, arm, torso or foot) is natural and produces more convincing sound when crossing foliage. For others, activation profiles such as small insects or big monsters, we thought it would be easier to simulate them in the studio afterwards. Certain sound sequences seem fake due to the fact that the sound produced by the body of the cameraman is added. Carrying the camera crossing foliage also activates leaves outside the camera's field. Therefore, the audio and the video images may not always be coherent. As a consequence, the coherence should be evaluated according to the precision of the physical interaction and the audio-graphic rendering in the camera's range.

Literature about audiovisual synchronization and cross modality perception show that the audio and the visual are complementary and synchronization can vary a lot and still be significant. (c. f. ventriloquism, Mc Gurk effect, works by Jean Vroomen and Beatrice de Gelder).

However to be effective, sound should, one way or another, stick to the visual events that appear in the field of the camera. In addition, it works better when sounds are related to visual events happening within the objective frame. A un-visualized event, outside the camera's field, often causes interference with the understanding of active events. As the colliding object: the camera or the first person character is not visible nor definite, we can be quite tolerant about its material or mental representation.

FOLIAGE SOUND LIBRARY

In order to benefit from our own foliage sound library with a variety of different aspects and species we recorded the manipulation of several branches and leaves in the studio. We also recorded some foliage sounds outdoor, but it was too difficult to avoid traffic sounds and to resolve the wind and activation problems. We manipulated them more or less violently to produce various sound movements and feign typical effects of crossings: the passage of the wind in foliage, the passage of a hand or an object on a leaf, or a group of leaves. Video shots are important to correlate the manipulation of the foliage and the sound produced by the leaves. Actions were carried out with a hand, another branch or leaves such as caressing, creasing, tearing away, shaking, crashing and hitting one or several leaves.

The remarkable sound differences we have noticed are related to the following criteria:

- The inflorescence: the numbers of leaves, their size and shape, the proximity of the leaves, their spatial distribution and the global architecture etc.
- The material: the texture of leaves and state of drought, and plasticity of the branch, deformation, elasticity, overlap and bruising etc.
- And the energy of manipulation, the kinds of gestures with the hand or other leaves: the speed and movements etc.

Manipulation of various foliage species:

<http://vimeo.com/14824022>

Sound sample classified by species:

<http://vimeo.com/14862003>

Doing this work, we have noticed that when listening to the sounds without the image of the movement, they all seem to sound more or less the same and do not have much significance, it is especially difficult to imagine their real movement. This may sound obvious, but the view adds very important information for understanding what we hear: spatial origin, causal action, physical reason for a specific sound particularity, activation mode and action.

Therefore, it seems that synchronization is more important for realism than sound timbre.

In *L'Audio vision* [1] Michel CHION analyze the perception of an extract of Ingmar Bergman's *Persona* (1966) in three times: sound and image, image alone and then sound alone.

Applying this method to videos of simple sound actions such as manipulating foliage appeared to be an extremely interesting experience. However, it became even more interesting for manipulating the simulation in real time. We thought that anyone should be able to tell how convincing and coherent an audio-graphic simulation of foliage navigation is. We then proposed to a small panel of students to manipulate the interactive simulation with sound only, image only and both sound and image.

USER EXPERIMENTS

The aim of the experiments was to determine the importance of audio-graphic synchronization in interactive manipulation and the relevance of the activation profile variation. All the tests concern the same scene of foliage, consisting of the image of a tree on which leaves can be touched by the rollover of the mouse cursor and emit a light noise of a leaf from our sound library. The test was realized with headphones.

Two kinds of activation profiles were tested:

(Fig. 2) A linear profile with a vertical line is a representation of the passage of the wind through the tree, triggering a larger quantity of leaves, and a punctual profile with a dot symbolizes the hand of the player

Exp. 1. First we proposed to navigate only with sound on a black screen, and we asked the user about this blind experiment.

(file A): <http://vimeo.com/14824062>

(file B): <http://vimeo.com/14824074>

Interpretation: All testers did heard a sound difference between profiles A and B. Non-specialized listeners often have difficulties to adopt a precise vocabulary without visual reference. A single person detected a larger quantity of sound elements in the A file.

Exp. 2. In the second experience, we proposed to navigate with the image and no sound in order to separated the perceptual analysis.

(Graphic 1): <http://vimeo.com/14824087>

(Graphic 2): <http://vimeo.com/14824095>

Interpretation: The majority of users successfully linked sound and image. We consider that finding the right answer demonstrates the audio-graphic coherence.

Exp. 3. Then we presented the audio-graphic version with the image and the associated sound. We asked users what the audio-graphic version adds to the experience and the relevance of using different activation profiles. i. e. punctual activation profile: <http://vimeo.com/14824104>

vs. linear activation profile: <http://vimeo.com/14824110>

Interpretation: According to the answers to this questionnaire, it seems that the audio-graphic version of the interactive profiles give more information about the navigation than both sound and image ones. It is also clear that the difference between the two profiles is perceived and understood much more easily in the audio-graphic version than in the single modality ones and therefore makes sense.

GEOMETRY AND NAVIGATION PROFILES

Using profiles enables inter-penetrability of clusters or complex objects to be simulated. For example, the collision of a hand with foliage or a collision between two foliage. In the case of manipulation of foliage, the number of collisions and the sound parameters would be too complex; inflorescence and parameters of materials, multiple triggers etc. Within the *Topohonie* project, we have developed methods to simplify the use of profiles.

In the following sections we will develop the generic term of profile, for example, triggers can be on/off or progressive. They can either have the function of source, activator or both source and activator. This paper focuses only on activation profiles. Clusters of triggers are one way to simulate complex profiles. They can have different shapes and sizes.

The sounds triggered by collisions of foliage are multiple. For example, a breeze of wind in a birch does not produce the same sound as a gust of wind in a palm tree.

We could use progressive profiles with variation of unit sizes in order to increase and decrease the activation within a profile. The activation variables can be volume, density, strength, quantity, speed, agitation, friction, scratching, sounds and visual effects produced by other sources etc.

We are now working on more elaborate activation profiles and their audio-graphic behavior and renderings.

(Fig. 3): <http://vimeo.com/21154344>

Crossing foliage seems an uncommon experiment. The player immerses himself in a 3D environment representing an impracticable jungle. In some cases the user may seek to circumvent the obstacles represented by trees rather than passing through them. But in order to evolve in the 3D space, the player needs to cross the foliage. When the player can see the First Person, we can assign a specific form to the activation profile. So we can illustrate crossing foliage like a breeze of wind, a hand or a stick. The display

of the activation profile seems necessary to justify collisions. The visual effects are not yet currently the expected ones. It seems clear that each collision triggers a coherent visual action. This model demonstrates the necessity of the consistency of the different activation profiles which match with the collision sound.

Sounds results classified by activation profiles shapes:

1. Plan: collisions are less frequent and seem unrealistic.
2. The cluster of points: We obtain distinguishable iterations. The multi-points of contact created more interaction in the game play.
3. The cluster of various size spheres: The progressive approach is more sensitive, sounds are depending on the size of the spheres.
4. Surface of a capsule: we get a collision at the entrance and exit of the surface, it does not seem coherent.

We can improve the collision by distinguishing two modes:

- Trigger mode (triggering the first collision)
- Continuous mode (continuous control during the contact with the shape).

We have also noticed that the visual shape of the profile influences the way the user interprets the audio-graphic behavior.

CONCLUSION

The relevance of using different activation profiles was demonstrated by the user experiments. In the 3D interactive scene, we have tested various kinds of activation profiles to control different sound behaviors. The shape of the activation profile and the sound behavior both determine the meaning and understanding of the interaction. The number of units in clusters and the synchronization of these numerous collisions must be precise enough to express these rich interactions.

Our experiments and analyses show that activation profiles can be visible in order to visualize the interaction. Players have a better feeling of navigation when they can anticipate collisions.

This experimental approach brings a new point of view to the visual and sound synchronized modeling. This approach allows us to imagine new forms of audio-graphic expression, by navigating across landscape and soundscapes. The user can play both sounds and graphics actors with his own movements crossing activations profiles, like Tarzan crossing the jungle.

Topophonie Project <http://www.topophonie.fr>

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'TOUCHED ECHO' – THE SENSE OF A GHOST

Morten Breinbjerg

In this article, I will discuss the urban art installation *Touched Echo*, by German artist Markus Kison, in order to reflect on the ghostly nature of sound, and how echoing sounds of the past – in this case, the sounds of the allied bombing of Dresden in February 1945 – interfere with both public and private life, with reality as history, that is, known, objective and factual, and as lived, that is, remembered and experienced.



Touched Echo, 2007-09, Markus Kison, Photo, Copyright Markus Kison.

Introduction

Sound unfolds in time, and disperses in space. It arrives from a distance, and resonates in the body of the listener. An ephemeral phenomenon, it disappears, but returns as an echo. Thus, sound represents what David Toop has described as the presence of an absence, [1] something that is and is not, something more than a spirit, but without a body; in short, a ghost.

In this article, I will discuss the urban art installation *Touched Echo*, by German artist Markus Kison, in order to reflect on the ghostly nature of sound, and how echoing sounds of the past – in this case, the sounds of the allied bombing of Dresden in February 1945 – interfere with both public and private life, with reality as history, that is, known, objective, and factual and as lived, that is, remembered and experienced.

The relationship between the remembered and the known, between the subjective experience and the historical fact upon which *Touched Echo*, touches and echoes today's political debate on this incident as either an act of war or an act of terror: a debate that concerns the city of Dresden as a haunted place, the land of ghosts. In order to qualify my discussion of *Touched Echo* and the ghostly nature of sound, I will draw upon Jacques Derrida's concept of 'hauntology', and Gaston Bachelard's poetic idea of the miniature.

The Spectre

In *Specters of Marx* (1993), the French philosopher Jacques Derrida criticizes the rather uncritical celebration of liberal democracy to which the end of the cold war, the fall of the Berlin Wall, and later, of the Soviet Union, led, particularly with regard to the 1989 article of Francis Fukuyama, *The end of history?*, where Fukuyama writes:

"What we may be witnessing is not just the end of the Cold War, or the passing of a particular period of post-war history, but the end of history as such: that is, the end point of mankind's ideological evolution and the universalization of Western liberal democracy as the final form of human government." [2]

Derrida's goal is not to criticize liberal democracy, but to critique the whole idea of an 'end of history,' that is, the modernist idea of a final stage in human development – a kind of Utopia, perhaps? Therefore, his critique is also directed at Karl Marx himself, and the idea of communism as the basis for the ultimate and perfect society.

As the father of deconstruction, Derrida bases his critique on a single metaphor: The spectre, taken from the opening line of Marx and Friedrich Engels', *Manifesto of the Communist party of 1848*, in which they state:

"A spectre is haunting Europe — the spectre of communism. All the Powers of old Europe have entered into a holy alliance to exorcise this spectre: Pope and Czar, Metternich and Guizot, French Radicals and German police-spies." [3]

Marx's and Engels' reference to communism as a spectre leads Derrida to examine the nature of this spectre, and the political power it wields.

For Derrida, it is evident that liberal democracy is not the answer to all the problems the world faces in the early 1990s, and to proclaim the end of history is merely a continuation of the historical ambition of exorcising the spectre of communism, to make the spectre disappear. But liberalism is not the only exorcist on stage, since communism also has the ambition to exorcise the spectre: not by making it disappear, but through the realization of a communist society, that is, to make the spectre present itself, to make it a living reality, something that is seen, and which occupies a place in history. Derrida believes that both strategies, the liberalist hope of making the spectre disappear, and the communist ambition of making it real, are totalitarian approaches, since both proclaim an end – an ultimate form of society.

However, Derrida holds that the spectre never dies, nor does it manifest itself. As the "visibility of the invisible," something which remains "beyond the phenomenon or beyond being," as Derrida describes it, [4] the spectre returns to visit us, and becomes what we, with a rather brute reduction might call a

‘stone in the shoe’ or a ‘speck in the eye’, somewhat as Wiki Leaks currently is to global power structures. Herein lies the spectre’s political power, which, whether fearsome, mystifying, or alluring, enables or perhaps even forces us to reflect on the current state of society, and all powers’ totalitarian potential.

In order to describe the nature of the spectre and its power, Derrida coins the term ‘hauntology,’ a neologism that, as an existing word in French, is inseparable from ontology. Hauntology represents a concept that describes the power of things that are present, but beyond being, and therefore nowhere to be seen: something that threatens to make visible what we forgot, or have tried to hide, something that leaves traces for us to see, and for others to follow.

The ghostly nature of sound

In *The Poetics of Space* (1958), the French philosopher Gaston Bachelard discusses the concept of ‘miniatures,’ a concept he uses to describe how poetic expressions unfold a larger, imagined world. For an immediate understanding of Bachelard’s idea, the miniature is a condensation of a cosmos wherein the unspeakable is spoken, silence is heard, and the invisible is visualized. It is an opening into the world beyond perception, through the poetic imagination of the poet. To exemplify the miniature, Bachelard quotes, among others, the Polish writer Czeslaw Milosz, and his writing on silence: “Listen – now there’s nothing – but complete silence – listen.” [5] Silence is somewhere on the border of perception, perhaps between perception and imagination. It cannot be fully experienced, but is easily recognized, and its presence opens a door into a larger imagined world that is both alluring and frightening.

In *Sinister Resonance* (2010), David Toop writes of how we find the world uncanny when sound stops, when everything is silent (a well-known, and often used effect in movie production). One reason that we experience silence as both fascinating and frightening might be that silence is a condensation, a concentrated moment full of potential energy, or, to put it more poetically, a miniature of an unleashed cosmos – a withheld Big Bang.

In keeping with the writings of Toop and Bachelard, silence is like a ghost, and qualify as a miniature; a poetic imagination beyond perception, simultaneously appealing and terrifying, as are the auditory hallucinations of Edgar Allen Poe that find their way into his uncanny story, ‘The Fall of the House of Usher,’ a story that Bachelard discusses in ‘The Poetics of Space.’ Or, as Toop mentions in ‘Sinister Resonance,’ when, late at night we seem to discover a hidden world from the subtle noises that suddenly make themselves heard, when we become uncertain of what we are hearing, or whether we are hearing anything at all.

‘Touched Echo’

Touched Echo by German artist Markus Kison, was a public sound installation at the *Brühlsche Terrasse*, in the city of Dresden in 2007. The installation presented the sounds of the allied bombing of Dresden on February 13th 1945, using original recordings of bombers flying over the city, and exploding bombs. The sounds were hidden as vibrations in the railing running the length of the terrace. The listener had to place his/her elbows on the railing, and rest the wrists on the skull, in order to hear the sound, which then resonated through the bones of the forearm, to the cranium. The posture of the listener resembled that normally taken in order to avoid listening. This is no coincidence, but, as Kison noted, a feature of

the artwork, since it is a posture one can imagine the victims of the actual bombing taking, in order to shield themselves from the horrifying sounds of the aircraft and the exploding bombs. See Fig. 1.

In the context of haunted places and spectres, it is interesting to notice how the sound in *Touched Echo* is not really 'on air', but only in the head of the listener, as is the case with schizophrenics or those experiencing auditory hallucinations. Murray Schafer, the soundscape theorist, has introduced the concept of 'schizophonia' [6] to denote the split between an original sound and its electronic, acoustic reproduction that, as a free-floating media object, is detached from its original time and space, but which may be reproduced at other times and places. As 'schizophonia,' the electronic, acoustic reproduction of the bombing of Dresden enters the present as an echo of WWII, and becomes a medium through which the historical and present time and space reach each other. It is truly the presence of an absence, something that is and is not, a spectre, as Derrida's constant reference to Hamlet, in *Specters of Marx* indicates: 'to be or not to be.'

Although the sound is only heard in the listener's head, the installation immediately enters the public sphere, in the sense that it also echoes today's political debate on the incident as an act of war, or an act of terror. As a spectre, it brings the historical act into political discussions of the present. Today, and most recently with regard to the 65th anniversary of the Bombing, in 2010, conflicts arose between neo-Nazi demonstrations and counter-demonstrations of local citizens and left wing activists, a conflict that showed how the city is a haunted place, and how the incident resonates in the memory of the people and the history of the city, as an echo or a voice from the past that will not die away, but keeps coming back.

In Greek mythology, Echo was a nymph who used her beautiful voice to distract Hera, the wife of Zeus, when he enjoyed the company of other beautiful nymphs. When Hera discovered this, she punished Echo, so that Echo from that day forth was only able to repeat the words of others. However, as we know from our own acoustic experiences, Echo does not only repeat the words spoken by others: Her voice is a distortion, and as such she manages to once more have a voice of her own, a voice that is not to be trusted, that exists between the real and the imagined, the truth and the lie.

Conclusion

Touched Echo exists on the border of the perceived and the imagined, the real and the staged, the private and the public. Although it is a sound installation, there is nothing to hear, since what is there is only in the head of the listener. But where does the actual recording stop, and the auditory hallucination start? What is the difference between, memories and historical facts? These are some of the questions *Touched Echo* asks, without answering, and in this uncertainty lies the poetic imagining of the work, and of the ghost and the miniature, an imagining beyond perception that is needed by both people and the places in which they live, but also, if we care to listen to Derrida, by the societies we build. If we are to avoid totalitarianism, the end of history, we must accept the poetics of the ghost, whether what we experience is a dream or a nightmare. That is, we have to find a way of living with the ghost (the good and bad of history, the fact and the lie, the sound and its echo) without making it disappear or become real.

"Haunted places are the only ones people can live in" Michel de Certeau writes in *The Practice of Everyday life*, [7] but some places still need to be exorcised, in order to become habitable. How to do that, without being totalitarian, that is the question.

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'AITIAI' CONCERNING GENETIC ART

Andre Brodyk

This paper adapts an essential aspect of Aristotle's concept of 'aitiai' suggesting an analogous interpretation in new media 'Genetic art' theory called the 'Proto – animate Condition.' I argue that fundamentally, causal properties underlying the concept of aitiai are characteristically pending action requisites and that this property is somewhat analogous to the causal properties of proto – animation.



Fig 1. proto-animate20, 2011, Andre Brodyk, gmos, semi-readymade chalk, variable. ©Andre Brodyk, Photo : Symbiotica.



Fig 2. john doe 0324, 2011, Andre Brodyk, transgenic E.coli, recycled timber, Plexiglas Petri dish, variable, ©Andre Brodyk, Photo : Andre Brodyk.

Introduction

This paper adapts an essential aspect of Aristotle's concept of 'aitiai' suggesting an analogous interpretation in new media 'Genetic art' theory called the 'Proto – animate Condition.' [1] The idea is therefore to ruminate on one aspect of aitiai within a contemporary translation rather than suggest an equivalence to Aristotle's overall philosophy.

I argue that fundamentally, causal properties underlying the concept of aitiai are characteristically pending action requisites and that this property is somewhat analogous to the causal properties of proto – animation. The Proto – animate Condition, which I will now refer to in this paper simply as the 'proto – animate,' is a novel concept on Genetic art, which I developed and is concerned with the inner causal properties of specific types of molecular materials and processes. Generically, these are called non – coding materials and they include introns, ncRNAs and pseudo genes for example and I explain why they are referred to as non-coding molecular materials. In fact the non – coding quality of these are crucial to the argument of the pending condition advanced here.

So I draw upon my interpretation of this essential condition of the ancient philosopher's cause theory, which entail the operations of internal factors to advocate a novel pending condition of matter and form understanding at the internalized structures at a molecular level.

From this molecular perspective, the aitiai causal responsibilities are therefore perceived of as existing in a pending, proto – animated causal state. This is one, which approximates the recondite proto – animate condition operating inside the genomic matter / form matrix of living organisms.

I begin with a brief interpretation of aspects extracted from the concept of aitiai that are relevant to this discussion. I then briefly connect this in a discussion of the basics behind the theory of the proto – animate to show a comparable condition between each as the main argument of the paper. Finally, I also suggest how this causal condition can be expressed tangibly in Genetic art materiality. That is, by the creation of synthetic novel genes comprised of non–coding molecules, which exist in a pending condition as the fundamental expressive elements in my Genetic art.

Aitiai

The Greek word aitia (or aition) does not have a precise contemporary literary equivalence in English. However, as a composite meaning it can refer to an explanation, a responsible agency or cause for example. "Essentially *aitia* derives from the adjective *aitios*, meaning 'responsible,' " so the causal conditions responsible for something may sum this up in the context of my argument. [2] Besides referring to physiological agents, what is also noteworthy is that aitiai (plural) also refers to non-sentient items or what causes i.e. "*aitiai* the inferred inner, structural facts causally responsible for the outcome." [3] In my artistic interpretation, the central condition found in aitiai can provide a parallel to the essential quality of causation i.e. proto – animation, in a biotechnical art context.

In terms of outcomes referred to above, this can be anything from a biological entity such as man, to an inanimate thing such as a sculpture of a man. Aristotle's thinking is therefore also inclusive of non–sentient aspects, which also expand into asomatous terms and pre-conditional causal constructs. So not only are these inanimate, importantly they are also corporeal things, which used here mean potential circumstances. So this is important in my analogy because as I will demonstrate, it also connects the

idea of causal responsibility to inert properties located within non-coding, molecular, biological conditions. Therefore the pending, (potential) property of causal responsibility is also the intrinsic agency responsible for the causally outcomes in proto–animate bio–matrices.

Because Aristotle advocated the view that the aitia causes apply to and operate between the components of all generated compounds natural or artificial, such an atomistic or molecular disposition is therefore arguably an apt frame of reference for a molecular and genomic art context. That is, one involving what is both natural and artificial bio–molecular compounds considered in a contemporary genetic technology mediated environment. This includes the molecular spaces between these compounds. I explain what I mean by this shortly after illustrating what I consider to be relevant in aitiai.

Aristotle’s concept of aitiai, advocates four factors being responsible to explain matter and form relationships more completely i.e. four types of cause.

“An aitia can be a reason or motive or explanation, as well as a cause (as we understand that term). The four types of cause Aristotle identified were the material, formal, efficient, and final.” [4]

Because his four factors are explicatory causal types these are not passive by definition. As such each cause has a performative role as this abridged extract indicates.

“*material*: that from which something is generated and out of which it is made, *formal*: the structure, which the matter realizes and in terms of which the matter comes to be something determinate, *efficient*: the agent responsible for a quantity of matter’s coming to be informed, *final*: the purpose or goal of the compound of form and matter,” [5]

So while the four causes are designed primarily to account for substances, they also derivatively account for events and processes as the definitions above indicate. This is also important in a genetic, biotech context to explain regulatory processes involving non – coding materials. This is since molecular material processes are the root cause of organic expression involving matter (non–coding DNA) and form i.e. protein expression.

The composite of these four causes is collectively what can be considered as aitiai. Now beyond providing the above brief definition of these, I need to point out that I am not interested in the explicating the specifics of these causes per–se. Rather, I am explicitly interested in what amounts to the collective property of potentiality, which I see as the composite condition behind them, i.e. the potential.

Because this four–causal framework of explanation collectively represents potential as a performative explanation, it therefore represents the equivalence of a pending causal condition. This is something, which I advocate is characterized by its latent and temporal nature as well as recondite property. It is specifically antecedent to activity or animation as its potential is as yet realized; therefore it is in a pending state. That view is central to my argument.

For example, for Aristotle, “matter is *potentially* some *F* until it acquires an actualizing form, when it becomes actually *F*.” [6]

While aitia is this overarching causal frame of reference, Aristotle's account of matter and form interrelationships, which he referred to as 'Hylomorphism', is also integral to this pending context. This pending condition is illustrated succinctly as this following quote indicates.

"For Aristotle, matter, from the Greek *hyle*, is the common material stuff found in a variety of things; it has no distinct characteristics until some form is imparted to it or until the form inherent in a thing becomes actualized." [7]

So the interrelationship of form and matter or Hylomorph, is a potential condition and also therefore a pending one.

Aristotle view of aition shows organic development as a fundamental paradigm for explaining all material change and physiological processes. To continue, this involves the chemical processes going on inside living organisms being not dissimilar to those in the inert chemical world. So Aristotle's thinking is important because it provides an established early account involving a specifically organic model with associations to inert chemical materials. And as is indicated by Green and Groff, "parallels between organic and inorganic processes reinforced Aristotle's physiological model." [8]

So Aristotle's organic / inert association concept of aition is an account, which describes a pending condition "that because of which something comes to be" which is relevant to my idea of the pending nature of proto-animation involving a molecular paradigm.

The above account sketches the salient point of the potential condition inherent in aitiai. The pending condition intrinsic to the idea that is aitiai can translate here into a fundamental bio –molecular organic proposition. The following sketches the molecular equivalence.

Proto – animate

The central tenet in the concept of the proto – animate is the character of a pending condition, which I call proto – animation. It is used for explaining important material changes and physiological processes whereby "something comes to be", inside organisms specifically at the molecular level.

The pending condition explicated by art modelled on genetics involves so called non –coding molecular material in a predicament, which I argue is essentially a proto–animated material – form – space within genomes. A brief account of the science behind this helps to explain this.

According to eminent scientists such as Professor John Mattick Founding Director of the Institute for Molecular Bioscience in Queensland, non–coding materials such as ncRNAs and introns can be considered to exist within a particular molecular configuration inside genes. This is within an influential substrate layer under the coding layers of DNA. The coding DNA are called exons. Non–code molecules are considered to be inert because they were thought to be non – coding, that is being able to affect material changes in genotype output, as exons do. That is to effect physiological processes in organic form expression meaning protein expression. What is important about these latent molecular substrates is that while they are not directly responsible for coding proteins and as such are considered to be inactive, this position has been subject to conjecture in recent times.

It is now understood that the ostensible inert status of non-coding ncRNAs and introns is wrong and that they actually have a causal responsibility which is a regulatory role in orchestrating exons to effect coding through numerous intermediary stages. In other words the perfunctory coding capacity and ultimate affect of exons to code for proteins which manifest physiologically is co-dependent on so called non – code causation. The recondite nature of the functioning responsibility of such effects by these agencies of change is difficult to ascertain currently. Just like aition is, "that because of which something comes to be", this causal property and consequential affect, materialises essentially as a state of unfolding understanding. [9] This is a causal effect, which exists as a pending (and temporal) condition.

Furthermore this can be considered in that way because the causal responsibility of the recondite regulatory functions of non-coding molecular materials entails operations which involve an 'on' and 'off' state. This pending on or off state is thought to be responsible for directing coding elements in genes in different circumstances inside the genome. I suggest that non-coding elements i.e. introns and ncRNAs are a kind of recondite substrate; something which appear to have no fundamental properties at all, yet have the potential to cause anything, depending on what properties can be assigned to it. By this I mean the directional property to organize coding DNAs to make any one of an infinite number of physiological outcomes i.e. the colour of an iris for example.

Therefore rather than considering these non – coding substrates to be either inactive or active, I consider that their causal and performative qualities to be latent. Therefore I consider them to exist in an – between state of animation neither entirely active nor inert, but rather an anticipatory state of potential and pending action. This is a proto-animate condition which links inert chemical compounds i.e. DNA and organic affect i.e. coding through an anticipatory molecular space inside coding and non-coding layers within genomes. Essentially this is the concept of the proto-animate.

The importance of such a causal predicament in the genomic context can be estimated by virtue of the fact that this non – coding material has been preserved essentially un-mutated, over millennia. Furthermore its quantitative correspondence to organism complexity is such that the more complex organisms such as homo sapiens, have more of this regulatory, causal, non – coding material than less complex organisms such as bacteria have. So I suggest that in a similar way that Aristotle's matter needs some form imparted to it otherwise it remains un-actualized, so too the form of molecular non – coding materials needs to be actualized as a causal agent of protein expression.

"For Aristotle, matter, from the Greek *hyle*, is the common material stuff found in a variety of things; it has no distinct characteristics until some form is imparted to it or until the form inherent in a thing becomes actualized." [10]

Genetic art

The proto – animate condition can be expressed within Genetic art through the conscious use of such ostensibly inert molecular materials and processes, involving non – coding materials such as introns or ncRNAs. By using recombinant molecular processes involving these non – coding materials which have been reconfigured within novel gene sequences, their pending status is put into question. This is because the realignment of non – code molecular introns can be seen to potentially orchestrate a new and biologically viable reading, by altering the composition of a sequence. That means that the integration of

a reconfigured non – coding script inside a gene could cause and affect a changed reading by the internal chemistry mechanisms of an organism at a molecular level such that a coding exon could be created.

This Genetic art brings into question the veracity of the orthodoxy surrounding the status of non-coding elements as inert agencies when engineered creatively within such synthetic genomic trajectories created in the molecular biology lab.

Conclusion

In the biological molecular terms of reference being advocated here, I have suggested that the in – between or inter – genetic substrates of non – coding materials are molecular equivalences to matter not yet combined with form. This is because these are asomatous intercalating agents, which constitute a type of formless space within a chemical matrix occupying the space between two adjacent layers of coding DNA. Introns for example are circumscribed materiality, i.e. as strings of chemical bases, but they are considered formless matter here because they have not been comprehensively described in terms of activity causes. This is since such causation is known only in terms of regulatory transfers, which in most cases today are pending or unknown translations. This is why knowledge of causation, of how introns or ncRNAs affect coding outcomes as an exemplar or established paradigm is itself an intangible form.

So the crucial fundamental idea in my argument advanced in this paper concerns the pending nature of molecular non – coding materials, which I see connects with the composite potential condition inherent in Aristotle’s four factor causal idea. This is a re-interpretation of the central composite pending property in Aristotle’s *aition* translated into a contemporary frame of reference.

I have stated that essentially the claim that molecular biological is similarly, “matter is closely connected to potential or power; the potential or power to become some particular sort of thing”. [11] Paraphrased, Only by giving it form can it be made actual (i.e., made into an actual object of a particular kind). (By this I mean a protein expression output). Most importantly, I have said that this causal position evident in *aitiai* is a pending condition of animation and is therefore comparable to a proto – animate state of existence inside a biotechnology mediated matrix.

Since the causal effects of non – coding materials such as introns are intangible, they have not yet been given form; they therefore entail asomatous spatial associations between introns and exons. In order to demonstrate this potential existence in a pending condition I have proposed expression of such pending form via Genetic art. This entails using recombinant genetically engineered scripts taken out of the latent substrate layer realm and into novel realignments of introns with other non – coding molecular materials as potential proto – animates.

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DATA VISUALIZATION AND ECO-MEDIA CONTENT. MEDIA ART PRODUCED AT DIGITAL NARRATIVES WORKSHOPS

KARLA BRUNET & JUAN FREIRE

This paper presents an analysis of the material produced during the “Digital Narratives for community participation on coastal ecosystem management” workshops held in Cairu, Brazil and Aguiño, Spain. It is a reflection on the themes and contents identified and collected by the teenagers. Alongside our analysis tries to facilitate the exploration and to identify topics and problems relevant to the participants, their communities and territories.

1. Introduction

Digital media has allowed the development of narratives by a diverse array of communities and collectives that previously were overlooked because they are marginalized. Instead of a well-defined and finished product, these digital narratives are a continuous process of documentation and reflection based on individual and collaborative contributions using different formats, channels and media (audio, video, photo, mapping). In this sense, narratives could be considered platforms for art experimentation, learning and debate.

The objective of these projects is to produce “other” narratives paying attention to subjectivities and explanations of the environmental, social, political and economic problems and idiosyncrasies differing from the narratives offered by mass media and/or political bodies. In this sense, these alternative narratives provide visibility of hidden realities making them explicit to other stakeholders that otherwise would prefer to ignore them, putting in some way problems and collectives in the agenda of the decision-makers. So, digital narratives are media and tools for negotiation both internal (inside communities with the goal of attaining consensus in objectives and strategies to solve common problems) and external (with powers that make policies and manage these communities and their territories).

The present paper is based on the experience carried out in the project “Digital Narratives for community participation on coastal ecosystem management” that was developed in two coastal rural communities dependent on fisheries: Garapuá (Cairu) and Aguiño, coastal places located in Brazil (Bahia) and in Spain (Galicia), respectively. Both communities are representative of the diversity of cultural and socioeconomic conditions that characterize coastal fishing communities in Spain and Brazil. Garapuá continues to be a small village mostly isolated from nearby human settlements and where a strong feeling of community continues to persist. Whereas, Aguiño has experienced an important urban development in the last years and now this village is part of a large diffuse coastal settlement mixing rural and urban characteristics. In this Spanish site, people are less tied to the place and participate in wider social networks. It's expected that these socio-cultural differences are reflected in the vision that each community has of itself and its territory.

In both communities, experimental workshops combining artistic practices, new media and science were carried out for the creation of digital narratives dealing with ecological, cultural and socioeconomic issues in two coastal communities is here illustrated. Our basic hypothesis was that digital media could allow coastal communities to develop their own narratives about their life and territory, and especially

their use of coastal ecosystems. This process can be essential to promote mechanisms of community cohesion and to empower user groups to participate more actively in the co-management of their territories, along with scientists, public officers, politicians and other stakeholders.

A previous paper (Brunet & Freire, 2010) explained the motivation of the project, the workshop development, and a preliminary description of the main materials produced and results.^[1] The workshops were designed as a pilot project where methods and technologies for collaborative construction of digital narratives were assembled, tested and improved for the development of a collaborative framework. A toolbox of open methods and free software was brought together to facilitate future projects. The complete process is documented can be found on site of the project (<http://narratives.ecoarte.info/>).

In each place, exhibitions were carried out to present the results allowing people to know, discuss and compare their narratives with the ones from the other site. Both exhibitions and digital repositories can help to promote reflection and action about the identity and problems inside each community.

Here we present an analysis of the aesthetical and ecological content of the narratives produced during the workshops. We also present a description of the ongoing experimentation to visualize narratives (media, semantic content and geographic patterns).

2. Aesthetical analysis

Through creating these digital narratives, teenagers from both communities gained confidence and appreciation of their territories. In a brainstorm for the Aguiño photo workshop, we asked: “how do you see your future here, in this town?” The answer was “In the future, here it will become an abandoned town or a big city”. This states their view of the place as two extreme directions: one is the disappearance of the town due to migration towards cities (teenagers visualize themselves as part of this diaspora), or Aguiño becomes a suburban part of a larger city due to the development of nearby urban areas. After the workshop they stated that they realized that their place had other opportunities that they haven’t imagined before. And that yes, they could do things there in order to preserve their landscape and not having to leave town.

Allen Carlson (2000) defines the relevance of landscape appreciation on environmental aesthetics and its descriptions modes. Using literatures as example, he suggests that landscape appreciation is proposed by different sorts of descriptions such as: formal and ordinary description, factual description, and imaginative description. All of those are easily seen on the media produced on Digital Narratives workshops. Photos of beaches landscape from Aguiño and Garapuá are examples of ordinary description; they present the place as a postcard, very clean, distant and with no interference^[2]. The video of a worker opening the coconuts^[3] is an example of factual description since they present the action as an investigation about the man’s work, it presents the functionality of his act. And an example of the imaginative description is the map of legends^[4] created in Aguiño that display the location of the legends of their place, in there, they say that almost every rock in the sea has a legend.

The way we experience the environment as an art form can change from person to person, in our case, from community to community. In one community, for example, landscape appreciation can be the most important factor, while to the other, the contestation and memory can be more significant.

When comparing the results of the aesthetical experience of the two communities, some considerations stand out. For example, in Garapuá many of the teenagers had no previous knowledge on using the cameras, mp3 recorders and GPS, so their use and technological experimentation was more conventional than the use done in Aguiño, a place where the teenager were already used to the technology. This can be easily seen on the photos produced on both communities, the Garapuá's ones were more a documentation of their territory and community while in Aguiño, there was a graphical aesthetics concern to the photos. Meanwhile, the images produced in Brazil had a stronger narrative content and the ones done in Spain were more landscape contemplation.

In Aguiño, observing the photos produced we can see that landscape appreciation was mandatory for the teenagers to narrate about their territory. While in Garapuá, they focus the importance more on people than on places. Maybe that is related to the familiarity of the teenagers in Garapuá to other members of the community. When photographing they were interacting with their friends, uncles, grandmothers... In the Spanish community, frequently, they had no close relationship with the people photographed, not even knew their names.

The audio recording produced in both communities also had different approaches. In Garapuá, there was no experimentation with the audio, they recorded many storytelling, and many times, all recorded the same situation. We ended up with many audios of the same interview. On the other hand, in Aguiño they experimented a lot with the audio, they created and discovered unnoticed sounds of the place. An interesting example is an orchestra [5] that they created on a shipyard, just with the sounds of the machines. With the sounds produced we believe it was not a question of being comfortable with the recorder, the different results were more related to the effort and experience of the facilitators who could stimulate them to search for different perspectives. Here we can see clearly the importance of the role of the facilitator, in Garapuá, they only focused on the technical aspects of the sound and the editing software. Noticing that problem on the first workshop, we asked the facilitators of Aguiño to work more on the content of the audios than on the technical aspects.

The aesthetical appreciation in this project is a mixture of the senses perceptions and the cognitive effort. Angus McWilliam (2008:36), in "Developing an environmental aesthetic: aesthetics and the outdoor experience" says that:

...if aesthetic experience is ... a matter of pleasure derived from perception involving both senses and intellect, then it is more than just a question of seeing – it takes time. Time to allow sensations to impinge on our time for reflection on the meaning and impact of what we have experienced.

We believe that in Digital Narratives project, the aesthetics was not only a question of seeing, it was a question of acting, the teenagers had to take part of the project. The aesthetics experienced involved action and reflection on their place and territory. It was based on the complexity of the engagement, on the way they were asked to sense their community, through the digital media.

3. Ecological analysis

The coastal ecosystem is the context where the lives of these communities and peoples occur. Ecosystems are characterized by a series of "tangible objects" (physical and biological components) and intan-

gible processes that connect the different objects (i.e., river runoff or coastal currents, coastal fertilization, trophic cascades...) (Mann & Lazier, 2005) and the human experience of objects and processes gives rise to the landscape (Turner et al., 2001).

The work of workshop participants and the comments of the people interviewed shows us how they perceive their ecosystems and landscapes, and specifically which objects and processes they are aware and/or consider relevant and which ones are hidden. In this sense, this kind of analysis could be of great utility to assess the ecological literacy of the community (Jordan et al., 2009); their ability to understand essential ecosystem processes that support the sustainability of their natural resources and ecological services.

Our analysis of the contents produced during workshops demonstrates that teenagers have only a basic knowledge of the ecosystems. Also, this fact precluded them from engaging in depth in ecological conversations with people. A global analysis of materials allowed us to identify 6 main themes relevant for Garapúa's teenagers: 1) tourism / leisure, 2) infrastructures, 3) economic activities (especially fishing), 4) life histories, 5) ecosystem and 6) land ownership. Teenagers showed a strong capacity for critical thinking about their own identities and the result of their work presented an accurate description and critical analysis of the community and the territory. However, they only identified the basic elements when working with the ecology of the area: habitats (mangroves, beaches, reefs), animals and plants (especially trees and commercial fished species as clams or some fishes) and physical elements (water, small rivers...).

In the case of Aguiño, teenagers had a more contemplative and aesthetical attitude towards their environment, although the workshop and posterior discussions helped them to start to develop a certain critical thinking. In this sense their materials were more descriptive documenting a static nature and landscapes and they identified three main topics: 1) landscape, 2) fishing, and 3) life histories and cultural identity. They were mainly focused in large landscape features as beaches and coastal geological formations, and they were only aware of commercial animals only when they accompanied fishers in their operations at sea and/or at markets. Some basic ecological processes that are conflictive in the community, as pollution by sewage or processing industries located in the seashore, were also registered. However, only a basic analysis was documented and no in depth discussion was provided by their work.

Jointly, the narratives of both working groups allow identifying that ecological literacies are basic. Only the more symbolic and evident "objects" are recognized. Also some relevant "objects" as habitats or vegetation types and almost all ecosystem processes are not identified showing a static view of the landscape. They lack a conceptual view of their territory as a entangled network of objects and processes where any action affecting one component produces changes in other components and locations, and in this sense, their ability to understand how to manage the ecosystem is restricted. Some basic ideas lacking from the narratives are related to: effects of nutrient discharge in coastal fertilization, trophic dynamics of the biological communities, effects of overfishing in the abundance of resources and cascading effects in other species, or habitat changes by human disturbances.

Developing a comprehensive ecological literacy arises as a key objective to empower the community and develop their ability to influence decision-making in environmental management (i.e., territory planning, pollution control, fishery management). These topics are especially important because the economy of both communities is dependent mainly of artisanal fisheries and, to a lesser extent, a growing tourist activity that uses ecosystem services and it is dependent of landscapes.

Effective participation of communities in environmental management needs both an ecological literacy and capabilities for collective action allowing them to negotiate with managers and politicians. Digital narratives arise as a tool to improve both topics. In a first phase, corresponding to the workshops described here that started with a rather general goal, the construction and analysis of narratives is a way to identify the baseline of the community about their ecological knowledge and their attitude about the environmental problems and risks.

Future workshops could be more focused. For instance, facilitators could work with teenagers to show and discuss ecological processes and landscape dynamics and sustainability, and narratives could be a way to document and visualize these processes and to investigate how they operate in their locations. Other workshops could be focused on organizational aspects of the community, the existence (and/or the development) of a consensus about their main problems and about the actions needed to solve them.

In this sense, in Garapuá, the concentration of land property in a few hands (external to the community) was identified as a basic problem. Actually it was the only problem and conflict related with the management of the territory and ecosystem that was identified in the workshops. Decisions occurring out of the community could modify land use, i.e. with the building of large touristic resorts, modifying habitats and probably basic ecosystem processes as coastal erosion or reef deterioration, and traditional uses of coastal locations as beaches used as landing and boat repairing places or residential houses occupying the shore. The workshop demonstrated that although the problem is recognized, there is not a basic consensus about how to approach collectively this risk and which could be the solutions. Something similar occurs in Aguiño with conflicts between fisheries and coastal pollution and between fishers' organization with the regional government. In this area fisheries management has not been able to solve overfishing and local fishers organization claims a change towards co-management and the use of territorial users' rights. This debate is a topic of considerable interest but surprisingly teenagers were not aware of it.

4. Visualization and some conclusions

Art, being here a subtle form of communication and protest, uses data visualization to empower community members allowing them to visualize, and realize, facts that were sometimes misplaced, or hidden, or forgotten. The cataloguing and careful handling of the media produced during and after the workshops has a key role in this visualization. We have tagged all photos, videos, maps and audios in relations to its content in order to find patterns of significance on the material produced. At the same time, we explored software and graphical possibilities of this visualizing process.

The exhibition we did in both communities was a form of presenting the visualization of the material they have produced. We created a parallel of video projection, mixed photos by themes, played audio as content title, and printed large maps showing their territorial choices. We also placed photos on topographical maps of both regions helped by the workshop partakers. Besides the physical exhibition in the communities, we presented online all the material produced, this way, giving a broader visibility to the work. In order to better understand the internal relationship of the content produced, we did tag visualization of all the photos produced [6]. We used *Impure* software to create *Datanet* (Klanten, Bourquin *et al.*, 2008), a visualization in which the links between the objects are more important than the nodes. This visualization gave us a better perspective of what was important to them, about their location, environment and identity.

After we have finished the workshops and exhibitions, we concluded that we needed more time in the community for collaboratively editing and tagging the material, and more important, for their assimilation of the work they have done. It would be necessary a longer and more continuous work with them in order to engage a deeper reflection and discussion on the material produced. We agree with Mark Dawes (2008: 65), in "Beyond Process: Art, Empowerment and Sustainability" when saying: "A process-based model can be a highly successful approach to working with people in the arts, but the short-term nature of most projects of this kind limits more profound possibilities for growth within communities." However, our problem the length of workshops was not a decision implied only by us, the teenagers did not much free time either, many of them studied and worked fulltime. Additionally, it could be hard to keep their attention and focus on a longer period. So we had to condense the most in a few days, otherwise we would not have public.

In parallel we identified the need for more experimentation in the visualization of media and their semantic and geographical content to refine and improve tools and results. Visual interfaces should be the basic tool allowing people in communities to explore materials produced. Therefore, allowing them to get insights and develop reflections about the topics narrated at workshops. The workshops and research presented in this paper show the opportunities that the concept and method of digital narratives represent to develop art and ecological literacies and to empower communities for participation in environmental management. However, to fully demonstrate the potential of this approach developments in tools, improvements in the logistics of the workshops and an extension of the time of direct collaboration between workshop participants and facilitators are needed.

Acknowledgements

This project was funded partially by the AECID (Agencia Española de Cooperación Internacional para el Desarrollo) and with a research grant of FAPESB (Fundação de Amparo à Pesquisa do Estado da Bahia).

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MICROSCOPIC TRANSFORMATIONS: SCIENTIFIC VISUALIZATION, BIOPOWER, AND THE ARTS

Roberta Buiani

This paper examines the practice of looking and the biopolitics manifested in microscopy and scientific visualization. By simultaneously appropriating and subverting conventional models and notions of seeing, artists and the industry dedicated to visualization often trigger molecular, yet gradual changes able to transform the way in which we see the object of visualization, the concepts and notions that frame it.

Of Microscopes and Wonder

During ISEA 2010, science and arts collective Hackteria offered a DIY microscopy workshop that showed how to turn a cheap webcam into a microscope by simply inverting its lens. To complete this rudimentary though functional microscope, those who attended were given directions on how to build a microscope stage that had to comply with rather simple optics rules but had otherwise no aesthetic or material restrictions. The process concerning the collection of specimens and the construction of the instrument was unanimously considered empowering, enabling individuals with little or no technical knowledge to put together a functioning instrument. However, it was the moment the reverse webcam/DIY microscope was turned on and the mysterious world of the microscopic was suddenly revealed to the onlooker that caused most excitement. The workshop itself almost came to a halt, with mesmerized participants obsessively staring at a myriad of tiny organisms, suddenly made visible, busily making their way across the area magnified by the microscope. In the following hours, the participants kept going back over and over again to check on their creatures or trying different specimens to explore more of that unknown world. Equipped with LED and other simple electronics, they successively lit, stimulated and embellished this newly found mysterious world, to observe and wonder at its reaction and to turn it into a personal staged scene, a theatrical performance where the observer played the god-like director.

Proposed as a DIY workshop where technological instruments and scientific processes are demystified and détourned by artists and makers, Hackteria did far more than disclose the scientific principles needed to construct a homemade microscope and to introduce the participants to the new and unusual applications that this instrument could offer. The simplicity of the technologies used and the minimal operations performed during the workshop moved the attention of the participants from the technological aspects of microscopy, to the way in which default notions of seeing affect not only our approach to the object observed, but also how we build the instruments made to observe such object.

This shift fostered reflections on the significance of unveiling the invisible, an operation practiced in microscopy and scientific visualization and obtained by means of technological instruments such as the microscope (light or EM, depending on the magnification needs and the size of the object studied), and a variety of software packages like Tecplot [1], Vmd [2] or Chimera [3] designed for a range of distinct scientists and offering features that can be chosen according to what needs to be accomplished. How do

cultural assumptions and conventional approaches to seeing affect our reactions to the unveiling of the invisible? How are they reflected in the way these invisible objects are reproduced and re-created by means of the above technologies and software packages? Can these assumptions be rearranged?

Rearranged Context

The participants in the Hackteria lab were not indifferent to these dynamics, as their attitudes towards those tiny organisms captured by the webcam/microscope replicated exactly those default approaches to the invisible that many mainstream activities would invoke; mainly, an inclination towards “disembodied witnessing” [4], encouraging to interpret the microscopic world as alien and abject, resulting in a certain entitlement to manipulation and subjugation of the object to fit goals to their own benefits (or aesthetic pleasure) [5]. Yet, the nature of the environment, the minimal distraction posed by the technologies employed and the format of the workshop, which leaned towards self-reflexivity, facilitated a discussion about, and challenged, many of the cultural, scientific and goal-driven assumptions that creep into this and other similar activities.

The case of Hackteria is not an exception. A growing number of artists and creative individuals actively participate in scientific practices involving microscopy and the visualization of the invisible. To different degrees, they all manage to foster moments of reflection like the one described above, to create short-circuits, in the endlessly repeated narratives promoted by conventional modes of representation and normative rules leading to the visualization of the microscopic. However, the way that these short-circuits happen is rarely by means of direct critique or confrontation. In fact, most of these artistic initiatives seem to simultaneously implement and defy these regimes of knowledge. Artists participate in, rather than completely reject, the conventional rules existing in the sciences and in the cultural rituals of looking; being well-aware of the seductive power of the tropes that dominate their objects of research, they appropriate and exploit them. At the same time, they break these very rules and rituals, by relocating them outside the lab, by engaging the audience in debates about specific issues raised by their research, or by introducing slight changes that shake and induce reflection on problematic elements perpetuated by the above cultural/scientific notions.

Drawing upon a comparative approach that takes into consideration both conventional scientific practice and artistic elaborations in microscopy and scientific visualization, the purpose of this paper is twofold: first, it seeks to show how the above dynamics, both manifestation and subversion of a biopolitical regime that promotes an implicit homogenization of the message communicated by given practices of seeing, are also exemplified in many mainstream scientific operations that examine and visualize the invisible. The aesthetics and variety of scientific visualization in popular science magazines and science journals often reveal the urge to constrain, regulate and control visual expressions to serve a number of agendas. Thus, these visual expressions support and tiredly repeat old ideas of the microscopic as spectacle, other and abject. This inclination, however, is constantly ousted by a drive towards new ways of seeing, and towards challenging these notions, through subtle introductions of innovative elements (technological and conceptual) into the image.

Second, the above considerations confirm that the representation of the microscopic, whether it is done by an artist or by another professional is heavily mediated through, and not severed from, our cultural assumptions and notion of seeing. Works proposed by the Hackteria collective and by other artists like

Suzanne Edwards (whose work focuses on general microscopy), Luke Jerram and Caitlin Berrigam (who focused on the visualization of, and our coexistence with, viruses) are not exempt from engaging in the biopolitical mechanisms that characterize the scientific practices in which they are engaged. However, their location at the crossroad between the sciences and the arts puts them in the position to reveal with greater clarity those problematic areas and those assumptions that characterize the study and representation of the invisible. As a result, their work might be able to create dedicated spaces of debate, promoting public awareness of the practice of seeing, facilitating shifts in the already transformative fields of microscopy and scientific visualization.

Biopolitics of the Invisible

Using visual language, microscopy and scientific visualization are fully embedded in a system that mixes and exploits, on the one hand, technical information and “entertainment”, and on the other hand well-established visual tropes and innovation aspiring to move away from these tropes. These aspects seem in opposition with each other. Yet, they coexist any time the microscopic is reproduced.

Historically, Stafford reminds us, “the division between a sensuous, pleasurable, or merely curious *watching* and a rational, tasking, language-driven *observation* arose during the eighteenth century” [5]. The entertaining nature of a scientific image portraying a microscopic organism (“enjoyable watching” [6]) distracts the viewer from the specific information (“exacting observation”) provided by the image. However, the entertaining component also draws attention to the image, following a historical practice of seeing the object as the “spectacle of nature” [7], and as the work of god. The approach of the scientist towards the object seen through the microscope appears to be more the one of a voyeur than a detached viewer. The practice of observing organisms through a lens was an experience that combined a sadistic attitude towards the dirty and base, yet marvelous and fantastic, organisms under scrutiny, as well as a composed observation of rigorous scientific material on the invisible unknown where “mysterious animalcules with unexpected powers could be not only watched under the enlarging lens, but controlled and directed, even as they rushed by” [8]. The invention of solar microscopes that would allow many to observe minuscule worlds on a slide “contributed to the growth of a new and visual form of education heralded by the publication of scientific ‘amusements’, physical ‘recreations’, and useful toys” [9].

Today “There are a variety of potential uses for visual representation as a learning tool [...] The scientist, the science communicator, and the public use visual images in many of these capacities, as news and information about science is made available” [10]. Despite the rise of a new “instrumentalized” looking where images are produced to achieve goals and to communicate specific information, entertainment and aesthetics were never expunged from the scientific observation and rendition of the microscopic. In fact, the contemporary goal-oriented practice of microscopy has maintained an implicit aggressive approach to the space of the microscopic as a territory that can be colonized and dissected, subjected and manipulated. The object of study is treated as if it could be indefinitely manipulated through processes like staining, coating and freezing. This treatment is reflected in science magazines and journals, where microscopic entities are depicted in isolation, are artificially tinted with fluorescent colors, their shape geometrically enhanced as if they emerged from an alien world. This assumed otherness uncannily brings up memories of the colonial and postcolonial approach to the racialized other, and the apprehension towards the mysterious and base world of the exotic unknown [11]. This entitles the scientist to

manipulate microscopic entities without much ethical regret and entices viewers to express a voyeuristic curiosity not unlike the one manifested by their Eighteenth century colleagues.

The entities we examine through the microscope are translated as images, which “reproduce something recognizable, with which we are able to interact and that we can seize in their characteristics”[12]. These images are pieced together through a pattern of associations extending along history and culture, helping us organize our memory and our thoughts, enabling us to retain what we see by enacting more associations with other familiar images. The observer classifies an object and associates it to a variety of other forms and objects. This mechanism of self-regulation turns images and gestures into a communicable form of knowledge. Tropes and cultural indicators drawn from popular imagination (the fear for viruses, or the assumed dirtiness of other microscopic organisms are all characteristics evoked by the colors and shapes used to reproduce them on journals and magazines) have sometimes the ability to distort messages disseminated by labs or by scientific committees, by creating false assumptions and alarmism, and triggering stereotypical ideas of the microscopic as dangerous, filthy, monstrous. Yet these tropes and cultural references are needed. Eliminating these elements would hinder the recognition of a microscopic entity such as a bacteria or a virus or would obstruct the communication between scientists working in different areas of science, or between technicians and graphic designers.

The practice of microscopy and visualization are located in a biopolitical system, where the homogenization promoted by the tropes utilized, the claims of scientific objectivity and exactitude, as well as the well-established conventions that bind the activity of scientists and other professionals are constantly trying to catch up with an increasing variety of techniques, aesthetic experimentations and unconventional perspectives. Assumptions about the behavior, or the disruptive characteristics of bacteria and viruses are passed on and recognized across different images through patterns, colors and shapes, they are added as familiar elements to the scientific data retrieved, acting as invisible agreements that allow the recognition of a particular entity. While any innovation in the visualization industry needs to acknowledge these elements, it also constitutes a continuous challenge to them. In fact, any slight modification to or elimination of a trope to validate a new scientific finding might throw the whole system in disarray, as the patterns of recognition that had been put in place are disrupted.

In Foucault’s account, biopower refers to the “conjunction of strategies adopted by the state and a diverse range of institutions and agencies to constitute and govern the population, made possible by forms of specialized knowledge and self-governing participants”[13]. Visualization and microscopy participate in this system by appealing to a series of implied rules that are not imposed, but are needed to keep the whole system in balance. The above-mentioned historical combination of information and aesthetics in early microscopy simultaneously modulates and challenge the practice of seeing. In a similar way, the default patterns and conventions used implicitly govern and limit microscopy and the resulting visualization. Yet, the never ending renewing and upgrading of visualization devices and imaging techniques, voice the drive of scientific visualization towards engaging with incessant innovation, as well as the inability to come out with a fixed set of regulations on how the microscopic must be represented. The dialectics between these contradictory tendencies does not paralyze, but fuels the continuous renewal of scientific visualization and fosters new ways to approach the study of the microscopic.

Microscopic Transformations

As mentioned above, a variety of artists have engaged with the practices of microscopy and visualization. The Hackteria collective, as well as other artists such as Luke Jerram, Suzanna Edwards and Caitlin Berrigan have followed the trends of the industry: they can't escape assumptions and tropes utilized by mainstream science and understood by the general audiences. In fact, this seems to be the only way that works engaging with these scientific subjects can communicate with a crowd accustomed to deciphering scientific messages by using common patterns and by assuming a quasi-colonial approach to the objects represented. The focus of these artists is on triggering small innovative changes that reflect on sometimes-unnoticed details in the production of microscopy and visualization. This proves effective in shaking assumptions that had never been questioned before. Thus, following this principle, in a series of glass sculptures reproducing the molecular structure of well-known viruses, from HIV to SARS, glassblowing artist Luke Jerram eliminated coloring, and with it, a number of assumptions that are normally evoked when fluorescent colors are used to represent microscopic organisms. Indeed, Jerram's colorless sculptures trigger a series of reflections regarding the role of colors in the molecular visualization of viruses. First, this choice dissipates the wide-spread idea that the colors embellishing pictures of microscopic entities are natural and not artificially applied (for technical or ideological reasons). Second, if the choice of colors to portray a microscopic substance can influence the way in which we see and interpret the image, then, eliminating one of these elements has the potential to underline the extent to which such practice reflects and, in turn, "adversely distort the opinion of the viewer" [14].

Similarly, Caitlin Berrigan's molecular models of the Hepatitis C virus, faithfully reproduced "from a magnified 3D cryoelectron micrograph" found in the Protein Data Bank, were sculpted using chocolate, and offered to the gallery goers to test their "desire to eat the enticing chocolates mixed with a repulsion for the infectious virus"[15], and thus, to challenge popular assumptions of contagion and virus-human coexistence. While the accuracy of the appearances and the material used, chocolate, triggers anxiety regarding Hepatitis C and its means of transmission (apparently some spectators had to be reassured that the chocolate candies contained no virus), the edible form of this particular representation definitely exposes the uncanny familiarity and ubiquity of this virus, with which many people often silently and secretly, sometimes unknowingly, coexist. Berrigan's decision to use chocolate is, according to the artist, an "approachable way to ignite discussion and facilitate awareness in public environments" [16].

Like Jerram and Berrigan, Suzanna Edwards' series of micrographs focused on the rendition of the microscopic object and on the effect that processes, instruments and assumptions have on the way we represent and we see such objects. Using an old stash of Nineteenth century slides she had found in a charity shop, Edwards took digital photographs of selected specimens which she submitted to a number of different microscopes (from light microscopes from the Nineteenth century to modern electron microscopes) "documenting and utilizing each stage of microscopy development"[17], and illustrating how the image of the specimen reproduced by each microscope was transformed according to the instrument and magnification used. When we see an image reproduced through a microscope on a science magazine, seldom are we told what type of microscope has been used or what processes have been utilized to obtain such picture. We are never shown how other microscopes would portray the same object. While Edwards' archival work doesn't fit the immediate agendas of science, it carries both educational and historical significance and may benefit both scientific and popular audiences. In fact, by exhibiting a variety of micrographs that expose the processes that lead to the visual representation of the

scientific object, it manages to redress the assumption that these images reflect an immutable, standardized, and “verisimile” reality: it shows how the object, once portrayed by the microscope and passed through editing, technological manipulation and conventional analytical approaches to seeing cannot be understood as neutral.

Regardless of their diverse topics and goals, the above artworks have the ability to lay bare unquestioned issues in the practices of microscopy and visualization. This is achieved by displacing and appropriating these practices and by turning them into creative gestures and artistic experimentations. Science is relocated outside the lab and turned over to the collective reflection of individuals, who might or might not be aware of issues concerning microscopic organisms and the practices that lead to their visual display (in galleries, cultural gatherings or groups of discussions). These artworks may become effective in producing different levels of molecular transformations: they enable the artist to expose specific and novel aspects regarding a microscopic phenomenon and the way we observe it that conventional visualization could not be able to do; they indirectly affect the aesthetics concerning the practices of looking and the very scientific production of images in science.

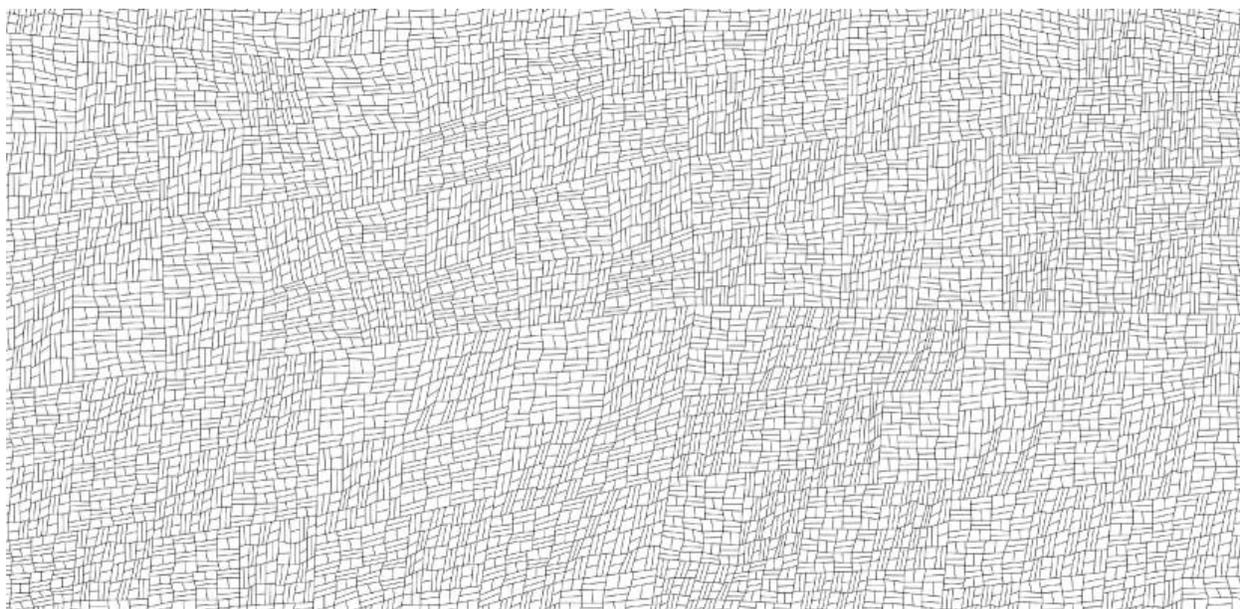
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COMPUTATIONAL DRAWING: CODE AND INVISIBLE OPERATION

Brogan Bunt

Drawing upon my own experience in developing the algorithmic drawing project, *Loom*, this paper considers the relationship between conceptual and non-conceptual dimensions of drawing in computational art. It is concerned particularly to reflect upon the nature of this aesthetic labor, which involves not only programming but also the blind space of procedure.



Loom, 2011, Brogan Bunt, archival ink-jet print (author's image).

Subdivide an initial polygonal shape into a set of smaller polygonal shapes. Apply the same process to each of the polygons in the new set. Continue recursively.

This instruction could be regarded as the concept informing my recent exhibition of algorithmic drawing work, *Loom*. The work explores aspects of recursive geometric subdivision. Simple shapes are subdivided into further smaller shapes. Applied many times over, complex patterns and textures emerge. I have reservations, however, about expressing things in these terms, since my aim is to question the notion of a purely conceptual space that precedes and dominates the sphere of technical implementation and execution. The instruction above echoes the form of a Sol LeWitt wall drawing statement, yet it can hardly be said to be purely conceptual. It is expressed in linguistic terms. It is mediated through the impurity and materiality of language. More specifically, in conceiving the aesthetic possibility of polygonal subdivision, I am drawing upon particular programming constructs and dimensions of computational process. My creative ideas are shaped by the thinking of data structures, algorithmic pathways and iterative patterns.

However, my interest here is not so much in demonstrating the various ways in which my conceptual drawing statements are inevitably affected by the space of programmatic logic and implementation, but

in attempting to reconsider the relationship between the conceptual and non-conceptual aspects of computational making. Drawing upon the model of the Jacquard loom, my work positions computational processes as mechanical means of weaving virtual cloth from simple algorithmic patterns. My aim is to engage with the compelling power of computation, which is linked for me to the mystery of its dumb operation - its strange invisible labor. The computer is bound by regimes of instructional necessity, yet the opaqueness, scale and speed of its processes suggest an uncanny agency. This paradox is vital to my work. The abstract algorithmic schema – whether expressed as a conceptual statement or as a formal body of programming code – is never sufficient on its own. It must be played out on a surface. It must pass from the uncertain consciousness of code to the uncertain unconsciousness of iterative procedure. It is precisely in the tension between algorithmic conception and repetitive, non-reflective enactment that the process of drawing takes shape.

COMPUTATIONAL LABOR

The images in my *Loom* exhibition depend upon a work of programming. However, another dimension of labor, the computational labor of machine execution (drawing), is also relevant. How can we make sense of this work? Can it even properly be considered a genuine form of labor?

Within the Hegelian-Marxist tradition, labor serves as a vital index of human rational and social activity. It represents the sublimation of immediate gratification towards the goal of producing useful things. [1] It is something that we undertake and endure with other ends in mind. In this sense, a key aspect of human labor relates to the awareness that we could be spending our time differently, that we are sacrificing the here and now for some other delayed space of superior satisfaction. This aspect of conscious, steadfast and resigned choice is clearly absent in mechanical forms of labor. The labor of the machine is unreflective. It simply proceeds. It is precisely this feature of machine labor that attracted Alan Turing when he set out to critique David Hilbert's axiom of decidability. [2] The distinctive characteristic of the finite state machine is that it proceeds step by step, without any contemplation of alternative possibilities. It is this incapacity to reflect that finally leads to its undoing. A recursive logic pushes it towards reflection, becoming trapped in an internal contradiction. Very importantly, however, Alan Turing's conception of computation does not represent an effort to distinguish the special character of human labor and thought. Instead, it serves to clarify the mechanical character of axiomatic mathematical procedure. In a critical and ironic manner, it demonstrates the relevance of the machine in conceiving the apparently pure workings of mathematical logic.

If machine labor appears especially alien, it is because it represents an aspect of ourselves that we are especially keen to avoid. It serves as the uncanny double of the repetitive, mechanical, materially determined and non-reflective dimensions of human action. In this manner – in its curious, unsettling agency – machine labor disturbs our self-image as free and rational agents. Within this context, it is worth recalling that Aristotle distinguishes between thinking and unthinking dimensions of *techné* (making). The habitual character of manual labor, which can proceed without a clear understanding of underlying causes, is contrasted to the conceptually informed practice of the master-artist.

Inanimate things bring about the effects of their actions by some nature, while manual workers do so through habit which results by practicing. Thus master-artists are considered wiser not in virtue of their ability to do something, but in virtue of having the theory and knowing the causes. [3]

Here the rift between human and mechanical labor takes clear social shape. Hegel also emphasises this social dimension, tracing its historical and dialectical development. He argues that the rise of industrial society transforms labor into a vehicle for alienation. In becoming social (and economic), in shifting from the sphere of individual and local production towards the general commodity market, labor grows increasingly distant from any space of immediate concrete realisation or exchange. Endlessly abstracted and endlessly deferring immediate gratification, concrete labor becomes decoupled from human scales of meaningful action. The rise of industrial manufacturing processes – of machine labor and of human labor rendered machinic – only exacerbates this sense of alienation: “[the worker] becomes through the work of the machine more and more machine-like, dull, spiritless. The spiritual element, the self-conscious plenitude of life, becomes as empty activity.” Machine labor produces what Hegel terms a “life of death moving within itself.” [4]

Despite this negative assessment of the implication of machine labor, from my point of view the interesting feature is that Hegel does not position mechanical labor as an entirely alien force (an external imposition). Instead, an intrinsic dialectic is acknowledged. The contours of modern alienation are immanent within human labor at the outset. They are evident in the initial split from immediate appetitive being. In its dimension of stoic self-abnegation, human labor takes shape as a paradox. It is both constitutive of rational human being and indicative of a turn away from the simplicity of integral organic being. In this sense the separation of the machine – the dull, dead, spiritually vacuous motion of its instrumental functioning – appears as an exacerbation or materialisation of a tendency that will have always been, in some sense, properly human.

PERFUNCTORY EXECUTION

In my experience, programming represents a liminal space. It projects an intimate and entangled relationship between human and machinic processes of coding and decoding, agency and determination. Nonetheless, software programming is typically conceived in terms of notions of conceptual priority and anteriority. Here, an interpretation of the legacy of conceptual art becomes relevant. The work of Sol LeWitt, for example, is often regarded as emblematic of a neat, hierarchical split between conceptual and material-practical aspects of making. In an article about his 2004 *{Software} Structures* exhibition, Casey Reas positions Sol LeWitt’s wall drawings as a model for his own software art practice.

The relation between LeWitt and his draftsman is often compared to the relation between a composer and performer, but I think it’s also valid to look at the comparison between a programmer and the entity of execution. [5]

Software programming is likened to the conceptual field of LeWitt’s written wall drawing instructions, while the field of program execution (of computational process) is likened to the manual labor of realising the instructions on any specific wall. At the same time, however, Reas acknowledges a key point of difference. LeWitt’s instructions lack the precision of programming code. They are conveyed in natural language and directed towards human readers. Rather than entirely restricting the space of execution, they work to suggest a focused field of creative possibility. Reas is keen to regard software art in similar terms, aiming to identify a form of conceptual software practice that precedes actual software programming, providing a generative conceptual basis for all manner of actual algorithmic drawings.

The work develops in the vague domain of image and then matures in the more defined structures of natural language before any thought is given to a specific machine implementation. [6]

He employs the term “software structure” to designate this pre-computational, creative-conceptual field and associates it with a potential for intuition and expressive freedom.

I want programming to be as immediate and fluid as drawing and I work with software in a way that minimizes the technical aspects. I often spend a few days creating a core piece of technical code and then months working with it intuitively, modifying it without considering the core algorithms. I use the same code base to create myriad variations as I operate on the fundamental code structure as if it were a drawing – erasing, redrawing, reshaping lines, moulding the surface through instinctual actions. [7]

No doubt LeWitt’s wall drawing work is full of curious paradoxes in which the machinic and the intuitive intersect, but it seems odd to harness it in the interest of describing a notion of expressive and de-technologized computational drawing. LeWitt is associated much more with a critique of the modernist concern with subjective, materially-based expression. As Ana Lovatt suggests, “[a]gainst prevailing notions regarding the immediacy, directness and primacy of drawing, LeWitt devised a drawing practice that was always already mediated by technologies of reproduction and communication.” [8]

Now while Reas never positions software structures as literally material, he conceives them very much in terms of “the vague domain of image”. [9] In this manner, the notion of software structure recalls the mute and intuitive aesthetics of formalist modernism. It envisages an intimate, traditionally expressive realm of creative conceptualization that is grounded in the space of perceptual manifestation. In this respect, Reas reinforces the boundaries between the intuitive and the procedural. The domain of conceptual expression, of software programming, is positioned as a form of alienation from intuitive conceptualization. It manifests the underlying concept in an estranged language that is properly distinct from the inner sanctum of creative conceptual imagination. A conceptual space is delineated, but in terms that precisely correspond to the reassuring visibility of the material image.

I prefer another reading of LeWitt's wall drawing project. Rather than indicating a neatly hierarchical division between the conceptual and the operational, his work suggests a play of mutual imbrication, mirroring and exchange. Moreover, rather than the conceptual appearing as a subjectively grounded sphere of autonomy and dominance and the executable as an utterly derivative space of expressive material determination, their relation is articulated in profoundly curious and unsettling terms. Consider this classic statement from his 1967 *Paragraphs on Conceptual Art*.

In conceptual art the idea of concept is the most important aspect of the work. When an artist uses a conceptual form of art, it means that all the planning and decisions are made beforehand and the execution is a perfunctory affair. The idea becomes a machine that makes the art. [10]

This appears to belittle the sphere of actual making. The work of manual drawing is portrayed as trivial and secondary. However, there is an ambivalence. The term “perfunctory” suggests a task that is mechanically performed, without any sense of subjective investment. This strangely opens up an affinity to the nature of conceptual practice. LeWitt insists that “the idea is a machine that makes the art.” [11] The conceptual then is also interpreted in mechanical terms. Both the conceptual and the executable are stripped of subjectivity. They both preserve a procedural, non-reflective aspect. In his 1969 “Sentences on Conceptual Art,” LeWitt describes the ideational blindness of the conceptual: “The artist cannot imagine his art, and cannot perceive it until it is complete.” [12] Ultimately, the intuitive machinery of the conceptual enters into relation with the machinery of making.

28. Once the idea of the piece is established in the artist's mind and the final form is decided, the process is carried out blindly. There are many side effects that the artist cannot imagine. These may be used as ideas for new works.

29. The process is mechanical and should not be tampered with. It should run its course. [13]

The value of the "perfunctory" is clearly evident here. It is a productive dimension of mechanism that tests and inspires new concepts. Although apparently distant and distinct, the spaces of conception and execution find themselves allied and linked. They share a common antagonism to the thinking of subjective expression. Together, as paired coordinates, they suggest a notion of drawing that reaches beyond the human, struggling to find effective means to engage with dimensions of blind process.

SHIMMERING

I will conclude by briefly considering an alternative model for thinking the relation between conceptual and non-conceptual dimensions of computational practice. It is drawn from a specific mode of painting within Australian Indigenous art. Howard Morphy describes the technique of Eastern and Central Arnhem Land painting: "painting is seen as a process of transforming a surface from a state of dullness to that of shimmering brilliance (*bir'yunhamirri*)." [14] He describes a clearly defined set of steps:

1. The painting surface is covered in an overall wash (typically red-ochre).
2. The key forms are outlined in yellow and black and basic figurative elements are coloured in.
3. Large portions of the surface are covered in "cross-hatched" infill with a special long brush.
4. The final work involves "outlining the figures and cross-hatched areas in white to create a clear edge which defines their form." [15]

Stage one is a straightforward process. Stage two depends upon high-order artistic skill and a close understanding of relevant representational traditions and protocols. Morphy notes that the second stage is performed relatively quickly by "a senior person." [16] Stage three is the most time-consuming, demanding technical skill but less demonstrable cultural knowledge. The final stage draws the painting together and is closely directed by the senior artist.

My specific interest is in the sophisticated mediation that this artistic process enables between elements of conceptualization and mechanical technique. The term 'mechanical' has to be used carefully here. It is less, in this instance, to liken Aboriginal painting to the characteristic forms of industrial production than to pinpoint a dimension of iterative, non-conceptually grounded process within Aboriginal art-making. It is not as though the work of producing cross-hatched infill does not have conceptual, aesthetic resonance, it is that it gains this resonance and this potential to shape a shimmering aesthetic surface by casting itself in terms of a repetitive articulation of time and space. The work has a ritual, performative aspect. In relation to the cross-hatching, Morphy argues that "Yolngu are not merely producing an aesthetic effect but moving the image towards the ancestral domain. The cross-hatched surface of the painting reflects the power of the ancestral being it represents, the quality of the shininess is the power of the ancestral beings incarnate in the object." [17] In this sense, the work becomes a means of summoning and invocation. Slow and mechanical, it shapes a real and affective alignment with dimensions of ancestral being and opens up the possibility of manifestation. From this perspective then, processes of conceptualization and mechanical technique are mutually imbricated. The distinction between concept and technique does not take a binary shape, but is instead structured as a play of mediation within the overall creative process. Concepts emerge as much from the labor of mechanical repetition, which

serves as a field of intimate communication and connection, as from the processes of mechanical repetition are inevitably inflected by the rich context of cultural meaning.

This example indicates other ways of making sense of the relationship between conceptualization and practical making within art; suggesting the need to re-evaluate the non-reflective character of making and to acknowledge the dynamic exchange between concept and mechanism within art. The relation between the two is no longer cast in binary and hierarchical terms – rather they appear congruent and enmeshed. I would argue that something like this is also what the creative programmer experiences. The close relation between writing, compilation and running that programming entails fosters a new, uncertain relation between the regimes of conceptual logic and mechanical operation. The programmer seeks not only to choreograph and determine computational processes, but also, at the same time, to explore an uncanny space in which the already alien algorithmic concept passes into the executable, non-reflective event and phenomenon.

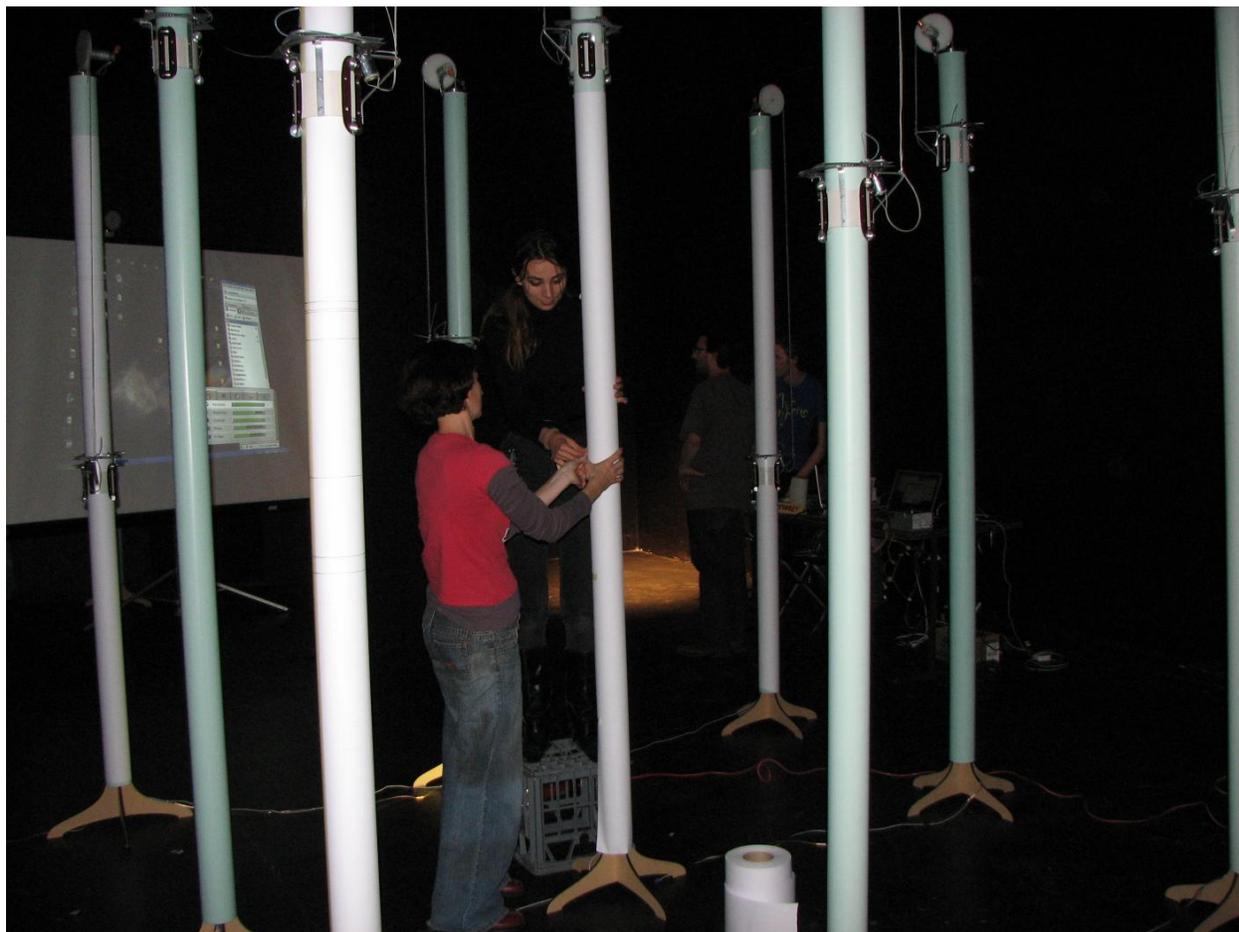
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CYBERNETICS AND THE INTERACTION BETWEEN PURE AND APPLIED SCIENCES AND THE HUMANITIES

STUART BUNT

In this paper I argue that the interactions between arts and humanities and applied science are more successful than with pure science. Further that the reason for this difficulty is the different paradigms used by those working in the post-modern humanities and the modernist, positivist scientists, that they are in fact incommensurable.



Silent Barrage under construction for the Silver Artrage Festival at The Bakery, Northbridge, Perth, Western Australia. This piece is by Guy Ben Ary and Phil Gamblen with the Potter lab in Atlanta Georgia. Each column bears a rapidly and noisily rotating disc which draws on the paper surface of the columns, the movement of the drawing discs are controlled by dissociated cortical neurons held in culture in the Potter lab and communicating with its embodiment over the internet.

SymbioticA, was founded in 2000 with financial help from the Lotteries Foundation of Western Australia, matched by funding from the University of Western Australia. [1] The original grant was written by Stuart Bunt, Oron Catts, and Miranda Grounds to provide a space for artists and scientists to interact in a

situation of mutual respect rather than dependency. One of the first projects of *SymbioticA* was *Fish and Chips* produced by the *SymbioticA* research Group was seminal in developing the principles and directions of this research laboratory. The researchers involved in this project formed a loose collective known as the *SymbioticA* Research Group or SARG. Using techniques developed during my D.Phil [2] research. Guy Ben Ary gathered a team of experts to produce a complex art work. Guy, and the kinetic sculptor Phil Gamblen have gone on to perfect, develop and extend this work with later pieces such as *MEART* and *Silent Barrage* which have been exhibited world-wide. [3]

For details of these works the readers are referred to the *Fish and Chips* web site. [4] Briefly these pieces consist of neural tissue driving a mechanical drawing device. In the pioneering *Fish and Chips* work the valves of the beautifully sculpted pneumatically driven arm, designed by Phil Gamblen, were controlled by the output from the region of a goldfish's brain connected to an isolated eye (the optic tectum). [5] An electrode picked up the electrical output of the tectal neurons in response to the images provided to the fish eye. A computer program written by Iain Sweetman then extracted patterns of neural activity and used them to control the pneumatic valves operating the drawing arm.

This relatively trivial science (the original physiological methods were first used in the 60's), [6] when brought into the public arena (*Fish and Chips* was first shown publicly in The Bruckner Opera house at Ars Electronica in 2001) [7] produced a powerful art work to be appreciated on many levels. How did we feel about such a "semi-living" object; part fish, part machine? A machine controlled by a non-human brain, with no human intervention can be very confronting. Could isolated neural tissue be creative? Did such an "artist" need feedback, to see what it produced? What were the ethics of using living animals in an art work? Later we were to encounter problems of ownership – who had the IP and moral rights on the - art works - produced by *Fish and Chips*?

In this paper I want to use *Fish and Chips* and other mechano-organic devices as exemplars of the interactions between art, science and engineering/medicine. I intend to make a clear distinction between these three practices and discuss the positive and negative interplay between them. I do not subscribe to the recent fad for suggesting a "third way," a romantic fusion of the arts and sciences, [8] a movement practically ignored by the sciences, but gaining popularity in the new media art world. In fact. I will argue that the language and gestalt of postmodern or post – postmodern arts are, in the words of Thomas Kuhn, incommensurable with those of the essentially modernist sciences. By science I mean pure or basic science, which is research carried out purely to increase our knowledge and understanding of the world. It presupposes an external reality independent of the observation or observer and in this way differs significantly from the creative arts that attempt to communicate an individual internal opinion about the world or to encourage the audience to bring their own interpretation to the work or performance; and from the post – modern humanities that resist the idea of contextually, semantically independent "truth."

Funding for such basic research is now rare and increasingly under pressure as public understanding and political support waivers (those in the arts will be all too familiar with this). Most research grants now demand an opening statement as to how the research will benefit the funders or mankind. Most research carried out in universities is now applied research, research to solve a known problem. This is engineering, bioengineering, not science, and I include in this medical research. It involves developing new technology, applying science, not adding new basic knowledge of the world. I see this as quite different in its methodology to pure science although there has historically been a continual positive feedback between science and technology.

The interaction between the arts and humanities and applied science and engineering is often positive. Here, the purity of the methodology is less important than finding a solution. Creativity and imagination have important roles. Much of current art practice and research involves the finding of a solution, how to communicate or represent the artist's concept, how to engage the audience, there are more similarities here than with the coldly analytical pure sciences. In many cases the arts identify new issues and problems to solve before engineers have even approached the solutions. There is a rich history of science fiction pre-dating or even inspiring later inventions. If we look at cyborgs, science fiction has often anticipated later developments, from Isaac Asimov's laws of robotics to prosthetically assisted soldiers. This positive relationship between the creative arts and applied science has been recognized recently by the Chinese government. Recognizing that many of the innovators and entrepreneurs of Silicon Valley were great science fiction fans when younger, they are now mandating more reading of science fiction in an attempt to increase the imagination and innovation of its engineers. [9]

While there is a clear interplay between the pure and applied sciences it is difficult to find any solid examples of a positive exchange between the arts and pure science. For example if we examine the field of bio-mechanical machines we see that the basic science involved requires an understanding of neuroscience, in particular how neurons and how the neural circuits they form, operate. The science underlying the electronics involves, understanding electromagnetism and with the use of transistors some quantum mechanics. This science has provided much inspiration for the humanities, "quantum" must be one of the most misunderstood and misquoted words in science. However it is difficult to find art/science collaborations that have contributed to our basic understanding of neuroscience or electro-magnetism. The humanities may have enhanced our understanding or misunderstanding of the implications of these discoveries and the errors that can creep into research due to human fallibility, but have they contributed to their discovery?

When we look at the art works involving mechanical arms and nervous tissue, they raise issues about the ethics of using living tissue, our ambiguous relationships with semi-living organisms, even reservations about the perversion of living material that this may be seen by some to represent. However, there is little contribution to the basic science. Take the examples of *MEART* and *Silent Barrage*. Here the driving material is dissociated cortical neurons cultured in the lab of the engineer Steve Potter. [10] Potter's laboratory was set up to investigate the self-organising properties of neurons in culture. In his "normal" lab work Potter's lab has looked at the way these neurons can control external agencies and whether feedback from the outside world can be used by the neurons. While this looks like basic science, it is nearer to an engineering project or even an art research project as the neuroscientific foundation for the work is weak or non-existent (although in a nod to the funders statements are made about solving epilepsy). All neuroscientific evidence we have points to the almost crystalline precise organisation of cortical neurons (which is laid down in early development) as being crucial to cortical function. Any disturbance of cortical organisation in development leads to severe functional deficits.

Where the art work has succeeded is in highlighting future possibilities and drawbacks of this work. Anyone presented with *MEART* or the whirling drawing poles of *Silent Barrage* cannot fail to engage with the confronting embodiment of a possible future "machine." No scientific paper can communicate so directly with the public. However, one could argue that this interplay between basic science and the arts has been largely negative as works are often displayed out of context and with minimal documentation (this is after all an art piece not a scientific exhibition). The audience may take away a predominantly negative impression of the potentials of the technology. This may well be a needed antidote to the positive "spin" of the medical companies advertising their surgical robots or prostheses, but the art works have far less control over what they communicate and may well misinform. Many viewers of *Fish and*

Chips embodied it with impossible sentience and feared it unnecessarily. This has led some scientists to be wary of working with artists, for fear of the negative impact.

The humanities have always employed critical analysis. They have, quite appropriately, applied the blow torch of social science and commentary on the sciences and have shown its many flaws; its sexism, elitism, Western dominance and corruption, the influence of big business and government on what is and is not researched and published. This has had a positive effect by making scientists aware of the limitations of their endeavours, but has had a largely negative effect on public opinion as this negative publicity is rarely matched by positive stories outside of medicine (an applied art?) and manned space flight, even the latter is now coming under fire for being an indulgence since the 2008 financial crisis. In the 21st century, the implementation of science often has more to do with societal acceptance than whether the science is correct or the resultant products efficient. The resistance to genetically modified foods, nuclear energy and anthropogenic climate change is not based on deficits with the science or engineering but with concerns over the effects of its application.

Philosophers such as Feyerabend have shown that hypothesis selection in science is not necessarily logical; that advances may be delayed by all too human resistance to new ideas. However, in spite of all its flaws, basic science has been enormously successful in its explanatory power. The strength of science does not lie in its random methods of hypothesis selection but in the empirical method. The examination, over and over again if necessary, of evidence using counter-intuitive methods, first laid down by Francis Bacon in the 17th century, but still as valid today. These rules for examining evidence call on the practitioner to deny his or her human traits, to not follow personal feelings or biases, to not be impressed by fame or reputation, to not follow popular opinion, to always maintain a healthy, independent scepticism.

This is the major point of departure from the arts, where the art work is all about the opinions, intuitions and feelings of the artist and his or her interaction with the audience, the "populace." These are very high level interactions, complex and contextually situated. No wonder postmodernism emphasises the complexity of the world, the interconnectivity and relativity of "truth" and "evidence". In contrast scientists are trained to avoid (as far as possible) all relativity and be as objective as possible, to "de-humanise" their work and reports so that the evidence should be independent of their opinions and personal experience. When C P Snow wrote his seminal work *The Two Cultures* he was describing both a class war and a wall of ignorance between the humanities and the sciences, berating the academics for their ignorance about the basics of science. How times have changed, it is a rare practitioner in the bio-arts that does not have a good understanding of the applied science (if not the basic science) underlying their collaborative work. However, most scientists are stuck in a post-modern world, perhaps it is they that are the new Philistines, ignorant of advances in the humanities. Universities still teach undergraduate science students (if they are taught any philosophy at all) the philosophy of science of Karl Popper, first proposed in the modernist twenties. Hypothesis testing requires evaluation of evidence, far from post-modernism, there is no suggestion that all points of view may be valid, the evidence must be ranked and the most unlikely abandoned. Scientists will even (though sotto voce in today's POMO world) say there are "facts" – that water IS made of hydrogen and oxygen, that this is context independent, will be so whether measured in a lab in Manhattan or a primary school in Kinshasa. If there is a disjunct it is now the scientists who do not understand the postmodern world of the arts and humanities.

This "dialogue of the deaf" between the arts, humanities and pure science would be of only academic interest were it not for its effect on public policy. The media is dominated by the humanities and the postmodern view of all views being of equal validity not privileging science with any special right to the

“truth” or even acknowledging that there is such a thing as an independent truth. This leads to the curious spectacle of climate change skeptics and charlatans like “Lord” Monckton being given equal airtime with a sole representative of the thousands of highly qualified and specially trained climatologists convinced of the anthropogenic causes of climate change. The basic science is given no special value, and as the “audience” does not share the same anti-common sense rigour of the scientific community they have no problem with ignoring the scientific evidence for what for many (particularly those reliant on continuing expansion of consumption) “feel” is right. Recently the Australian chiropractic association refused to censor a member who was promulgating lies about immunization, including long discredited studies linking autism with the MMR vaccine, on the grounds that he was “entitled to his opinion.” Worldwide scientific advisors have been politically marginalised as harbingers of vote losing doom. This abandonment of the empirical method is a frightening trend that leaves us no real alternative on which to base decisions that will effect our health, and the future well-being of the planet.

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DEMATERIALIZATION, MEDIA, AND MEMORY IN THE DIGITAL AGE

David R. Burns

On the 10th anniversary of 9/11, I explore the effects that the repeated broadcast of lossless imagery of the fall of the World Trade Center has on the individual and collective consciousness. I examine the relationship between the media industry's representation of events and personal and collective memories of events. I will also screen, *Rebirth*, my abstract 3D computer animation exploring my memories of the fall of the World Trade Center.

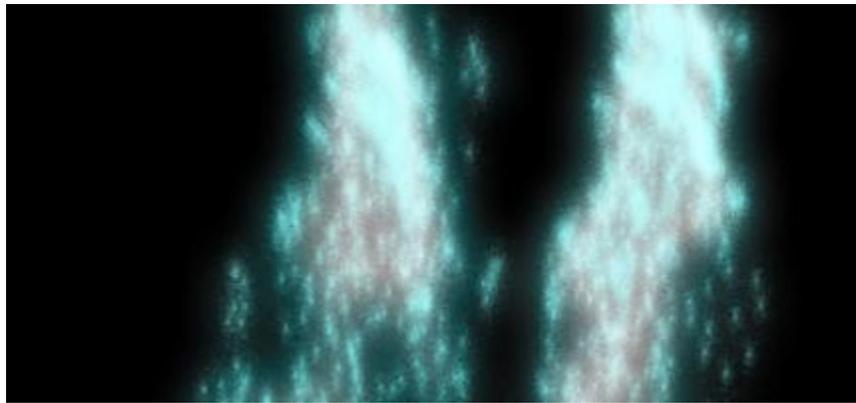


Fig 1. Digital still from Rebirth, 2006, David R. Burns, 3D computer animation, © 2006, David R. Burns.

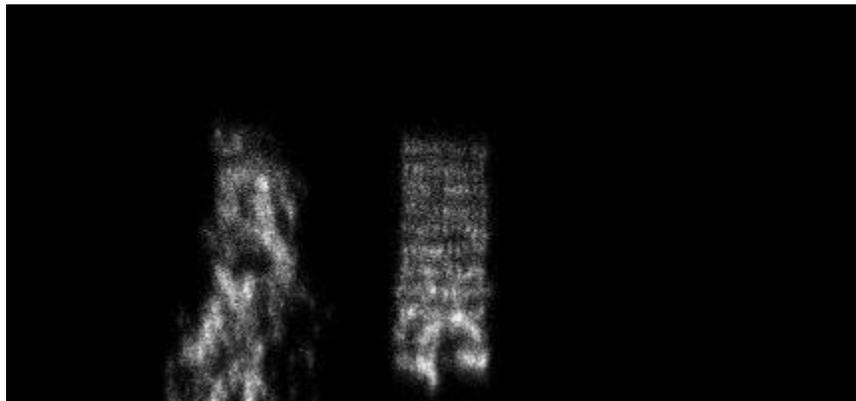


Fig 2. Digital still from Rebirth, 2006, David R. Burns, 3D computer animation, © 2006, David R. Burns.

Introduction

The ten-year anniversary of the September 11, 2001 terrorist attacks on the United States is an important milestone to reflect on those events and examine the media's influence in forming memories of what transpired that day. While several media outlets including Yahoo! News, [1] National Public Radio, [2] and CNN [3] are commemorating 9/11 in a journalistic context, my paper and 3D computer animation offer a personal remembrance of, and reflection on, the tragic events that took place on 9/11 in New York City. My paper explores the relationship between the media industry's representation of important events and our personal and collective memories of these events. The tenth anniversary of September 11, 2001 is a meaningful time to revisit a paradigm shift in the ways media are used to influence and mediate personal and collective memories.

September 11th 2001 was a perfect example of a paradigm shift in the way real-time memories are processed using digital media technology. On September 11th, U.S. civilians experienced an attack on U.S. soil via digital broadcast in real time as the events were unfolding outside their homes. This catastrophe was an example of a larger shift at the intersection of technology and memory. Digital media technology allowed viewers to experience events in real-time as never before possible on this grand scale because the archived digital recordings of memories did not dematerialize each time they were recalled. Instead, the digital memories remained intact and preserved, irrespective of the number of times the digital memories were replayed. The digital media technology used to record and recall the events were lossless and sharply contrasted with the older, lossy analog media technology traditionally used to record events. Archived memories that are stored on analog media such as film degrade over time much like the organic memories that we keep in our minds. Before exploring the dramatic effect of digital media technology on memory, it is helpful to examine Vannevar Bush and Nelson and Englebart's research using analog and digital media technology to mediate memories.

Background

Vannevar Bush's Memex machine and Ted Nelson and Doug Englebart's Xanadu artificial memory and information cataloging recollection system have explored the way memories are processed using media technology. Bush aimed to design a system that functioned similarly to the way natural memories are recalled in humans. He first outlined his concept in a 1945 Atlantic Monthly article titled, *As We May Think*. [4] While Bush's Memex machine was never actually built, he described an analog system of recording and accessing information on microfilm. His analog system could be linked to other archived data and linearly accessed using associative links. [5] Bush envisioned creating a tool that would connect society with memories and information so that individuals could better understand the human experience. Bush envisioned his Memex machine as an "extension of human memory." [6] Bush's work influenced Nelson and Englebart to develop a system called *Xanadu*. [7] In contrast to Bush's analog system of recollection with microfilm, Xanadu used digital hardware to archive and access information with digital hyperlinks to dynamically connect associations. [8] Compared to Bush's *Memex*, *Xanadu* was a more complex, dynamic, and interactive digital system for replicating human memory. [9] Bush's *Memex* machine used physical media -analog microfilm- mailed to colleagues to be added to other Memex machines' collections of information. *Xanadu's* "original hypertext model" [10] used digitized information that could be accessed in real-time using hyper-links across digital networks regardless of physical location. Bush's analog model took time for information to be delivered and processed by humans into memory. In contrast, Nelson and Englebart's *Xanadu* digital system provided real-time access to and mediation of memories.

Bush, Nelson and Englebart's work can also be used to examine the way analog and digital films can be used to archive and recall memories. In the past, memories were recorded using analog film and tape technology. The analog images and sound were representative of the original experience for the first several times that the analog media was played back. Over time, after the analog media was accessed several times, audio-visual information dematerialized and clarity became lost during the recall process. Because of the restrictions of older analog technology, memories that were captured using the analog process were also trapped in a linear method of recall. In contrast, digitally recorded memories are better able to retain the original clarity of the author's experience, due to the fact that digital images and sound can be copied and recalled infinitely without the loss of information or clarity of the memory being recalled. An additional benefit of digitally mediated memories is that they are better suited to be recalled on multiple delivery systems for greater ease of accessibility across geographies. Digitally mediated memories can also be experienced non-linearly, providing participants with greater accessibility for reconstructing and recalling memory information using multiple access points in a way that is most meaningful to them.

Personal Narrative

The ten-year anniversary of September 11, 2001 offers a unique opportunity to explore what can happen when a highly personal and collective event is recorded to the neuronal and digital memory systems:

Early on the morning of September 11th 2001, this author was still asleep in his cozy apartment in downtown Manhattan until being awoken by a phone call. I can still remember the phone conversation that jarred me out of bed. "Hello? What do you mean the WTC was attacked? Stop joking around. I am going back to bed! Turn on the TV? This isn't funny." To verify that this was just a bad joke my friend was playing on me, I turned on the TV to watch the news. There it was, playing back over and over again: a plane crashing into 1 WTC (World Trade Centre). In disbelief or shock maybe, I opened my window to stare downtown at the smoke that had by now begun to billow rapidly. This event was real! I was simultaneously watching 1 WTC burning both on TV and out of my living room window.

The feeling of watching in real time as the digitally represented WTC and the organic WTC burned on both the television set and outside my living room window seemed to put my immediate world on public display, as if I was now a part of the digital media being internationally broadcast across the world. I hadn't realized yet just how powerful this connection between myself and society was in the context of what I call, a "memory footprint." Instinctively, I grabbed my digital video camera and headed for the roof. I wasn't sure why I was doing this; I just knew that something tremendous was underway that would be deciphered later.

Once on the rooftop, I used my natural, organic eyes to view the natural images of 1 and 2 WTC billowing smoke. These images were burned in real time into my organic neuronal memory systems. Not fully comprehending what was unfolding before my natural input devices, I switched over to taping the event using a digital video recorder. Looking through the viewfinder, it became difficult for me to discern what was real and what was my memory of the earlier television broadcast. The feeling was very surreal. I had not yet processed the earlier TV images of the plane slamming into 1 WTC. Now as I looked through my digital video recorder's digital viewfinder, I found myself looking at a composition built of digital bits similar to the memory I had of the images that were represented as color pixels on TV. After staring through the viewfinder for a few minutes, my earlier memories that were recorded onto my natural

storage device, my brain, began to be processed by my consciousness. The realization that the memory of the event I had experienced was, in fact, still taking shape and form in real time was so intense and confusing that I had to pause the digital recording and look away from the camera's viewfinder. I was caught somehow in a real-time memory of great destruction, but that memory was not able to pass. The memory of watching the destruction of 1 WTC on television now merged into the real-time representation and memory of the destruction of both towers, 1 WTC and 2 WTC, that were in the process of being written to my analog neuronal memory systems.

I was processing with my natural eyes and brain and simultaneously recording discreetly on digital videotape. What was a natural observation? What part of my understanding came from the digital representation I had just seen? Confused, I looked through the digital viewfinder again. I needed to confirm that I was in fact physically and mentally cognizant, that I was indeed on the roof of my apartment building experiencing and memorializing a real-time event. I needed to make sure that I was not trapped in the confines of my living room and stuck in front of the TV set unable to differentiate what was real, what was recorded, and what was being digitally broadcast to society. I can only describe the feelings I had and the environment around me as chaos. It was as if I was trapped in a horrible film and everything that I watched through the camera's viewfinder made me a spectator of this horrible film.

Snap! I became aware of the real-time events unfolding again. Other people on the roof were shouting as something fell in the distance and more smoke billowed up into the sky. I turned and left the rooftop. Not sure what I was experiencing, I needed to sit down and process the events that had just unfolded before me. Later, I returned to the rooftop. There were many more people there now, and we were all witnessing the same event. However, something had changed. The skyline looked emptier. There was more smoke now and it was coming from the smaller buildings that surrounded 1 and 2 WTC. Again, on went the digital video recorder... An almost identical sequence of images to what I had seen earlier when 1 WTC and 2 WTC were burning was now being repeated multiple times as the rest of the WTC network of buildings, WTC 3, 4, 5, 6 and 7 began to plume smoke.

I wonder now, looking back at the time of that event and the several days following it, if the memories that I recall are my own. Have my own experiences of the event and memories of that morning recorded by my organic memory banks been replaced by the digital images broadcast on the TV repeatedly hour after hour for days and weeks on end? Is my memory of the events of that day more a composite of all of the digital images and analog stories recounted by my neighbors, colleagues and family that were in NYC that fateful day? I still have the digital video recording of that morning. Originally, when I came up with the idea for this project, I had thought that I would be strong enough to edit my digital video and transfer some of my digitally recorded memories to you today. It has been a decade since I put that digital videotape back in its case, but my organic memories have not yet faded enough for me to feel comfortable watching a digital, and therefore lossless representation of that day's events.

Rather than display the digital video footage that I recorded on 9/11, I will screen my 3D computer animation, *Rebirth*, that is representative of my memory of that day. *Rebirth* adds to the dialog and the process of individual recollection and memory of the tragic events of the destruction of the WTC on 9/11. *Rebirth* represents my memory of my personal experience. However, the audio-visual abstractions of the representations of the events on 9/11 contained in the animation are left open for audiences to interpret. It is my hope the audience will have a shared viewing experience in watching *Rebirth* that connects participants with a shared memory of an artist's renderings of the events of 9/11. Because the imagery is abstracted and there is no dialog in *Rebirth*, hopefully the audience will feel more liberated to

interpret and explore the imagery in the 3D animation. The viewing experience will then be archived into each individual's neuronal memories for later recall.

Conclusion

Ten years after 9/11, real-time events are more instantly accessible to influence collective memories than they were in 2001. Digital media technology has enabled more people than ever before to memorialize, archive, and access events and information in real-time. Digital media technologies that were unavailable a decade ago connect millions of people with each other's memories of important events in real-time and increase access to individual and collective memories. The global accessibility of high-speed Internet connections and mobile media networks have enabled individuals separated by great geographic distances to access individuals' representations of events and memories in real time. The instantaneous access to individual memory is shaping a collective global memory that is constantly updating and expanding.

The recent media coverage of Osama Bin Laden's death in 2011 is an example of the way digital media technologies that were unavailable a decade ago are now used to augment a collective global memory that is constantly updating and expanding. Osama Bin Laden's death saturated media beyond traditional forms of print, television and radio broadcast mass communication. News of Bin Laden's death immediately inundated social media and mobile media platforms including Twitter, Facebook as well as broadly accessible websites formatted for mobile phones. [11] In fact, the White House announced Osama's death with a tweet and a Facebook post immediately after President Obama's formal announcement of the event in his television address. [12]

The immediate access to real-time information is a further move on the paradigm shift in the way real-time memories are processed using digital media technology. Digital media technologies and social and mobile media platforms enable participants to experience events that inform their memories in real-time on a scale never before possible. Unlike the analog recordings that dematerialize over time, digital recordings of memories do not dematerialize each time they are replayed. Instead, digital memories remain intact and are preserved for later recall. The immediacy, permanency, and interactive qualities of digital mediated memories are transforming individuals' experiences with creating, accessing, and archiving memory on a global scale.

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BLUE SKY VINEYARD: OPPORTUNITIES FOR SUBVERSION OF THE POWER STRUCTURE IN THE SURVEILLANCE ASSEMBLAGE

Deborah Burns

My paper explores the potential of digital media arts technology to disrupt and resist apparatuses of control in surveilled commercial spaces. Although the consumer culture in these spaces appears complicit with the potential power in the surveillance assemblage, the leveraging of digital media arts technologies offers opportunities for the subversion of the power structure in the digitally networked surveillance assemblage.

Blue Sky Vineyard, a southern Illinois winery, is a surveilled commercial space. The multiple video cameras, credit card machines, and wireless network at this private location create an electronic surveillance system that can be used to monitor its patrons. Through my critical ethnographic study, I closely examined the culture and surveillance system at this location. Although the consumer culture at Blue Sky Vineyard appears complicit with the vineyard's potential power in the surveillance assemblage, the leveraging of digital media arts technologies offers opportunities for the subversion of the power structure in the digitally networked surveillance assemblage.

In its promotional materials, Blue Sky Vineyard says that it creates "a taste of Tuscany in the hills of Southern Illinois." [1] Indeed, patrons are encouraged to delight in Blue Sky's simulated Tuscan environment; visitors are asked to "enjoy the large indoor seating area" that overlooks the "vineyard and rolling countryside." [2] The "tranquil atmosphere" that Blue Sky advertises is supposed to create the "Comfort of Home" with the benefit of free wireless high speed internet. [3] The images of the rustic windmill and the Tuscan-inspired edifice surrounded by rolling hills foster the impression that Blue Sky is a relaxed environment where people can leisurely enjoy food and drink.

Upon entering the space, multiple laminated placards notify patrons in bold lettering that "This Property is Protected by Video Surveillance." These notifications did not appear to create any cause for unease among the patrons at Blue Sky. Patrons who sat directly in front of these signs for hours did not comment on the signs. The signs were relatively small, approximately 6 inches in width and length, but even those patrons who stood within inches of the signs did not discuss them.

Similarly, Blue Sky patrons did not appear to pay attention to the five video cameras that are located in the tasting room space. The three video cameras located in the wine bar area are well above eye-level and are skillfully integrated into the simulated Tuscan environment. The two video cameras that are located outside the Blue Sky wine bar area appear to be identical to the three wine bar area cameras, but they are not as well camouflaged in their environment as the wine bar area cameras. All of the cameras are small round structures, probably no more than six inches in circumference, which are painted in a neutral gray hue.

The cameras and credit card machines that are located at both the wine and food bars at Blue Sky can be seen as being part of a larger surveillant assemblage. This assemblage is made up of formerly distinct surveillant systems that have combined to become synthesized into a larger system. According to Haggerty and Ericson, this desire for integration across and among surveillance systems "allows us to

speak of surveillance as an assemblage, with such combinations providing for exponential increases in degree of surveillance capacity.” [4] Thus, visual surveillance can be combined with database surveillance to create an integrated system that is far more effective at surveillance than each of its component parts. Surveillance assemblages span the world with various surveillance devices working together to create data files on people in public and private spaces.

The combination of surveillance systems can be seen at Blue Sky Vineyard. Assuming Blue Sky gathers and records the information from its cameras, it could gain a wealth of information about its patrons and their habits. The cameras could enable the Blue Sky staff to gather practical information on which patrons drink which wines and how they use the tasting room space. They could allow the management to gain insight on who their patrons are, how long these patrons stay on the premises, and how Blue Sky can more effectively market their wares to sell additional products. When this visual information from the video cameras is combined with textual credit card information gathered when patrons make their purchases, Blue Sky can gain even more insight into their patrons’ identities and spending habits. Blue Sky could link patrons’ names on their credit cards with their images from the video cameras to identify these patrons and carry out targeted marketing initiatives. Through the surveillance of the free wireless network, Blue Sky could monitor the internet traffic within its walls. Once patrons consent to enter the free wireless network, Blue Sky has the ability to gain access to the data that patrons are obtaining on their laptops. Blue Sky can gather information from patrons’ internet searches on the wireless network such as their online shopping activities. Blue Sky could combine this information with the information from the video surveillance and credit card information to further expand the variety of consumer goods that it offers its patrons and carry out marketing initiatives that are even more targeted to particular patrons. The integrated combination of the video, credit card, and wireless network surveillance at Blue Sky is a far more effective surveillance mechanism than each of its component parts.

The integrated combination of the video, credit card, and wireless network surveillance allows Blue Sky to construct a digital double of its patrons composed of pure information. Haggerty and Ericson call this data “a decorporalized body, a ‘data double’ of pure virtuality.” [5] Indeed, Blue Sky may find that the digital doubles that it can create when it combines the data about Blue Sky patrons from the multiple video, credit card, and wireless network surveillance sources to be more useful to them in many ways than the actual living Blue Sky patrons. Haggerty and Ericson explain that digital doubles are “increasingly the objects toward which governmental and marketing practices are directed.” [6] The Blue Sky management may use the digital doubles of its patrons, virtual bodies composed of pure information, to make marketing and product placement decisions. This is an indication of a hyperreal existence where “simulation is characterized by a precession of the model.” [7] When and if Blue Sky uses the information from the surveillance assemblage to send its patrons publications on Blue Sky’s events, the digital double of the Blue Sky patrons becomes more real to Blue Sky than its patrons’ corporal bodies.

Blue Sky Vineyard may not use the information that it gathers from the multiple video cameras, credit card machines, and wireless network to monitor its customers. Perhaps the video cameras are not even operational. They may be simulations of surveillance that are displayed to discourage shoplifting and deter patrons from acting inappropriately. Blue Sky may not even monitor its wireless network. However, as shown by the examples above, the surveillance assemblage at Blue Sky is potentially very powerful because it can grant Blue Sky the ability to gain vast amounts of personal information about its patrons. Should it wish, Blue Sky can use the surveillant assemblage at the vineyards to create digital doubles of its patrons.

Indeed, if Blue Sky is using the surveillant assemblage, Blue Sky may not only be watching its patrons, collecting data from their credit card transactions, and monitoring their internet usage. The surveillant assemblage at Blue Sky is not a fixed entity with defined limits. Indeed, “to the extent that the surveillant assemblage exists, it does so at the potentiality, one that resides at the intersections of various media that can be connected for diverse purposes.” [8] The surveillant assemblage is an unstable, moving target because it can change at any time with advancing technology or changing demands on its infrastructure. For example, although microphones are not yet commonplace on closed circuit equipment, recent technological advances can allow Blue Sky to add microphones to its closed circuit television apparatus. In fact, Blue Sky may already have this technology. With audio surveillance, Blue Sky Vineyard can gain additional information about its patrons. It can listen to patrons’ comments about its wine and other consumer products. Blue Sky could potentially carry out even more targeted marketing by combining audio data from its patrons with their video, credit card, and internet data to create richer, more complex data doubles.

It is interesting to consider that Blue Sky management and employees may not be the only people monitoring Blue Sky patrons or potentially constructing digital doubles of these patrons. The dynamic nature of the surveillant assemblage allows the surveillant assemblage at Blue Sky Vineyards to connect to other parts of the larger surveillant assemblage that extends across southern Illinois and the world. This larger surveillant assemblage is composed of both private businesses and public governmental authorities. Although it is not likely that Blue Sky Vineyards links its closed circuit surveillance television network to the local police department’s database of criminals, there is the potential for this connection. Should there be a local man who is being pursued by law enforcement authorities, Blue Sky can provide its closed circuit surveillance television tapes to assist in the fugitive’s arrest. The data from the closed circuit television at Blue Sky, a private business, can be shared and distributed to the federal law enforcement authorities as well as international governmental authorities.

Just as the surveillant assemblage extends across private businesses and governmental authorities, it also extends to private citizens’ homes and personal digital devices. The surveillant assemblage is a rhizomatic system where widespread access to technology has given private citizens the opportunity to gain access to surveillance technology. [9] The so-called playing field has been leveled for the average man or woman. Private businesses like Blue Sky Vineyard and governmental agencies like the local southern Illinois police department and federal and international governmental authorities no longer have the exclusive ability to electronically surveil others. Private citizens have gained the access to technology that enables them “control, rather than be controlled by, a recording gaze.” [10] With the consumer electronics industry’s expansion into personal media devices in recent years, consumers have gained increased access to smaller video cameras, camera phones, and audio recording devices. Private citizens have set up web-cams to document their lives and broadcast this data live across the World Wide Web to others across the world. These citizens have taken control of the camera and used it to serve their private interests.

According to Haggerty and Ericson, while this increased access to technology has not resulted in “a complete democratic leveling of the hierarchy of surveillance, these developments cumulatively highlight a fractured rhizomatic criss-crossing of the gaze such that no major population groups stand irrefutably above or outside the surveillant assemblage.” [11] Private citizens, including young children, low-income, and traditionally disadvantaged populations, have gained access to inexpensive video cameras and audio-visual recording features on low-cost mobile phones. These recording devices allow these marginalized populations to access the surveillant assemblage and add their own media content to this vast, dynamic, and rhizomatic system. One of the most famous demonstrations of this increased

access was a private citizen's video recording of the police beating of Rodney King in Los Angeles. This recording resulted in a "turning back of the eye of authority upon itself." [12] The hierarchy of surveillance where law enforcement had the nearly exclusive power to electronically surveil the public was disrupted when a private citizen used media technology to challenge law enforcement's account of the events.

These disruptions and places of resistance are what give private citizens the opportunity to resist the hierarchical power structure in the surveillant assemblage. This hierarchical power structure favors institutional actors such as corporations and governments because these entities are far more organized and well funded than private citizens. According to Michel deCerteau, "*space is a practiced place*" and sites of resistance such as the recording of the police beating of Rodney King constitute deCerteau's places. [13] Like the surveillant assemblage itself, these actions and sites of resistance lack stability, but they are liminal places that offer the potential to challenge the current power structure in the surveillant assemblage. Should these isolated sites of resistance work together to expand the surveillant assemblage, they could threaten power structure of the surveillant assemblage and grant private citizens greater power in this assemblage. The more that private citizens work together to create places or sites of resistance, the closer society comes to an ideal democratic leveling of the hierarchy of surveillance. This democratic leveling of the hierarchy of surveillance would not allow Blue Sky to have greater and more powerful surveillance mechanisms than private citizens. Private citizens would have the same opportunities to surveil Blue Sky that Blue Sky has to surveil them.

Although it may seem unlikely that there will be the democratic leveling of the hierarchy of surveillance at Blue Sky now, there were multiple moments of disruption and sites of potential resistance at Blue Sky. On many occasions, I observed patrons using mobile media devices to record the grounds of Blue Sky. One man walked around with a handheld video camera to give his colleagues the opportunity to see "this cool place." A woman video recorded the bar because she thought that it was "so beautiful and unique." I witnessed other patrons using their mobile phones to take digital images of the tasting room space. These were moments when the surveillant assemblage at Blue Sky was expanding. There was a blurring between the observers and the observed and the subjects and the objects of observation. Indeed, these moments offered opportunities to resist the power of surveillance that Blue Sky potentially holds over its patrons. These moments are interruptions that can be viewed as challenges to the hierarchy of surveillance at Blue Sky Vineyard.

Such moments can eventually lead to other moments in which the surveillant assemblage grows to include more private citizens who are expanding the surveillant assemblage at Blue Sky. By leveraging digital media arts technologies, private citizens can offer opportunities to subvert the power structure in the digitally networked surveillance assemblage. Digital media artists can create media art pieces by placing webcams above their laptops and recording the activities at Blue Sky. They can digitally capture video and still images of the video cameras recording the Blue Sky patrons and the Blue Sky employees. These digital media artists can curate the images and broadcast their live and archived digital video and photographic data on websites that they can promote across the United States and the world. Digital media artists can also construct digital documentaries of the events at Blue Sky. They can take a sequence or series of still digital images of the video cameras themselves showing the video cameras in the context of the environment and how they are used to surveil the space. Digital media artists can document the participants and activities in the space and post their documentary data on websites that would expand the surveillant assemblage at Blue Sky.

Aside from using websites to expand the surveillant assemblage at Blue Sky, digital media artists can also expand the surveillant assemblage with art installations in public and private exhibition spaces. Digital media artists can use live digital feeds of the real-time surveillance activity and the digital still images they record at Blue Sky to construct visually and intellectually compelling art installations. Through these installations, participants at public and private exhibition spaces would have the opportunity to witness the live expansion of the surveillant assemblage at Blue Sky. More adventurous digital media artists may try to expand beyond the physical manifestations of the surveillant assemblage at Blue Sky and intercept the Blue Sky closed circuit television system, duplicate the data from this system, and create an art installation inspired by this system.

There may be legal implications to such activities, but such concerns may be inconsequential as the surveillance assemblage grows to include more data. [14] As the surveillance assemblage becomes larger and accessible to more people, these people can work together to represent their interests in the legal system. For example, the legal battles over Napster continue, but many users feel free to download music off the internet.

According to William Bogard, the “very logic of information networks that information must be free to flow between any part of the system, for surveillance means more ways to observe the observers, bypass their firewalls, access their databases and decode their communications.” [15] The master’s tools have the potential to eventually dismantle the master’s house. If the surveillant assemblage eventually expands to include more and more people and their networked technology, it becomes an increasingly open structure. Bogard explains that if “an information network is a rhizome, then information must be able to travel in all directions, directly or indirectly, from every node to every other node.” [16] The more virtual nodes that are included in the assemblage, the more difficult it becomes for both institutional actors and private citizens to monitor the surveillant assemblage.

This growth and expansion makes it increasingly difficult for governments and corporations to maintain control over the data in their information networks. Powerful and institutional members of the hierarchy need increasingly sophisticated technology to protect privileged information. However, these powerful and institutional members also supply private citizens with “the very information gathering, interception, sharing, blocking and editing tools they need to defy that control.” [17] Through purchasing and co-opting this technology, private citizens can gain access to this technology as it becomes available. [18] They can use this technology to subvert the power structure in the surveillant assemblage. When digital media artists capture video and still images of themselves in the Blue Sky space and post this information on the internet, they participate in and influence the creation of their digital doubles.

Blue Sky Vineyard is a commercial space that offers the critical ethnographer a wealth of information about surveillance and consumer culture. As a critical ethnographer, I chose an inductive qualitative approach to my study and I began “with an ethical responsibility to address processes of unfairness or injustice within a particular *liveddomain*.” [19] I locate my study within the tradition of critical ethnography because I am committed to challenging the status quo and revealing the concealed power relations in our complex society. [20] My study identified opportunities for changing the consumer culture at Blue Sky Vineyard so that digital media artists can challenge the vineyard’s potential power in the surveillance assemblage. I offered examples of activities that operated in liminal places, moments of disruption, and sites of potential resistance at Blue Sky. However, my study is not bounded by the confines of Blue Sky Vineyard. The strategies that I identified in my study can be extended to other

private and public locations across the United States and the world. It is my hope that people will embrace these strategies in these expanded contexts.

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PLAYFUL POTENTIAL – A SHORT GENEALOGY OF LUDIC INTERFACES

Mark Butler

This paper proposes that the ludic plays a fundamental role in the development of digital culture. From the beginning, personal computing and its interfaces have shown playful characteristics. The following will reconstruct a short genealogy of playful interaction, focusing on the development of *Spacewar!* as a pivotal moment; and take a critical look at the applicability of ludological concepts to digital media culture.

In a broad sense, ludic interfaces have been around since the beginning of cultural history. Their genealogy is at least as old as archaic board games like Mehen or Senet from Egypt's predynastic era (ca. 3500-3100 BC). The boards of these games offered recreative play in the full sense of the word, bringing together fun and spirituality while interfacing the earthly sphere and the netherworld. However, I would like to use a narrower definition of ludic interfaces that binds the term closer to digital technology, keeping in mind that, on the one hand, computers are related to board games insofar as the architecture of both implements a recursive rule governed process; and underlining, on the other, the qualitative leap in the genealogy of ludic interfaces that Alan Turing's conception of the "universal machine" from 1936 marks, insofar as it is programmable and offers the architecture of a meta-game, i.e. is capable of modeling every conceivable symbolic system. Both games and Turing machines enact the collision of freedom and determinism, "paidia" and "ludus" (Caillois), variable input and processed code, thereby offering an experience that oscillates between contingency and necessity.

Rule based games are key artifacts that helped develop the thinking about computer programs. Turing – as well as other computer pioneers like Charles Babbage, Konrad Zuse, Claude Shannon, John von Neumann and Norbert Wiener – spent time thinking about chess and the possibility of implementing it on the computer. The media theoretician Claus Pias emphasizes the essential role of games in the development of the computer:

The fact that Babbage, Zuse, Shannon, Turing or Wiener spent time thinking about playing chess, is neither biographical coincidence nor ex post ›use‹ or ›misuse‹ of the computer for the sake of play, but rather a ›thought picture‹ [*Denkbild*] (Benjamin) of the computer itself. [1]

Games were exemplary applications in the early years of computer science that offered important solutions for programming problems, which reached far beyond the purpose of play. Furthermore, it was only a few years after the construction of the first computers that the first simple games were implemented on them, one of the oldest documented ones being Noughts and Crosses from 1952.

At the end of the decade, the A.I. pioneer John McCarthy began to work on his chess program at MIT, with the help of students from the Signals and Power Subcommittee of the Tech Model Railroad Club (TMRC). Shortly thereafter, a group of these students formed around McCarthy's assistant Steve Russell and developed the first digital action game between December 1961 and April 1962 on the Electronics Research Laboratory's brand new PDP-1 (Programmed Data Processor): *Spacewar!* [2] The PDP-1 was equipped with one of the first programmable cathode ray tube screens and, more importantly, followed the direct interaction paradigm that had been inaugurated by its predecessor the TX-O (Transistorized

Experimental Computer Zero), the first transistor based computer that had been developed at MIT's Lincoln Laboratory in 1955, leaving the design philosophy of batch processing behind.

Even before the PDP-1 arrived the group around Russell was planning a new demonstration of its possibilities. In harmony with the Zeitgeist, the ludic interface pioneers were fascinated by spaceflight and their fantasies revolved around galactic battles between spaceships, drawing upon science-fiction films of the Toho Film Studios as well as the Lensman pulp space-novels of Edward Elmer Smith. According to J. Martin Graetz, the group came up with three criteria that a good demonstration should fulfill:

1. It should demonstrate as many of the computer's resources as possible, and tax those resources to the limit;
2. Within a consistent framework, it should be interesting, which means every run should be different;
3. It should involve the onlooker in a pleasurable and active way – in short, it should be a game. [3]

Thus Russell's group developed *Spacewar!*, a game that simulated a duel between two spaceships. Both ships began at opposite ends of the screen, while a randomly generated star-field was shown in the background. The action unfolded in real-time, with visual output and manual input. The movement of the ships obeyed the laws of a virtual physics – acceleration demanded time as well as valuable fuel and when a ship gained momentum, the law of inertia applied. In the first version of the game, each player had four binary switches at their disposal to control their spaceship: thrust, turn left, turn right, fire torpedo. However, since the switches that had been delivered with the PDP-1 hadn't been developed to be flicked hundreds of times within a few minutes, they quickly broke. Therefore, the ludic interface pioneers had to quickly develop new controllers. Kotok and Saunders developed the first 'game-' or 'joy-pad' out of parts made to steer model trains – a simple controller with four buttons for the four functions. In later versions, the group used an U.S. Air Force control stick that they found among discarded military equipment – the first 'joystick.'

The game was a huge success in the community surrounding the TMRC, even though the MIT administration gave all other uses of the PDP-1 a higher priority. The game's real-time visual-manual-interaction fascinated and captivated almost everyone who played it and the game ran during every free moment of the PDP-1 that spring. A large amount of the time spent playing with and working on *Spacewar!* – a difference that was steadily being subverted by the digital medium – occurred during late hours. The original version of the game was continually modified in the course of the following weeks during night time hacking marathons: Dan Edwards implemented a sun with a gravity field in the middle of the playing field; Peter Samson replaced the random star-field in the background with a precise replica of the night sky that ran through a 24 hour cycle every 60 minutes; Graetz developed a hyperspace jump that made the player's ship teleport to a random position on the screen; and Russell programmed a subroutine that showed the score for an open house day in spring of 1962.

Spacewar! was so successful that the producers of the PDP-1, the Digital Equipment Corporation, included it in the main memory of the computer thereafter. Furthermore, the game was also ported to other computer systems. Thus, it became popular in university computer labs nationwide, reaching as far as Stanford on the west coast. As it spread, further modifications were made such as space mines, invisibility, partial damage, an electric shock to accompany the destruction of one's ship, a multi-player-mode and a 2½-D version. The program permeated digital culture at the turning point from mainframe computing to personal computing. It influenced the pioneers of the PC-paradigm shift, for example Alan Kay who not only considered *Spacewar!* a standard application for his Dynabook – a prototypical laptop

for children that he worked on at the Xerox Palo Alto Research Center (PARC) – but also, and more importantly, built conceptually upon the playful real-time multisensory interaction the game offered. [4]

Playful Interaction

Spacewar! is one of the first computer hacks and the most elaborate that had been performed at the time of its implementation. It emerged from the young hacker culture at MIT that can be characterized by a playful relationship to technology and the world at large. The game was developed through a reappropriation of the digital computer – a machine that had previously been almost exclusively used for supposedly ‘serious’ endeavors such as breaking encryption, processing large amounts of statistical data or running military simulations – to model a science fiction fantasy. The question of what constitutes a sensible use of computers has a different answer for different people. The hackers saw much of the authorized use as unnecessary, just as many sanctioned users saw the development of *Spacewar!* as a waste of computing resources. Pias underlines the relativity of ‘legitimate’ computer use that the hackers brought to the fore:

Every program that runs is legitimate. There are no false games in the true, but only aborted play and crashed programs. Every use can only appear as a misuse within a context that is delimited by law or economy, encoded by normality or passed down through institutions. [...] Hacking subverts the terms of right or wrong use, it deconstructs in a sense »misuse« itself, by showing that an idea of technical function, which is bound to a human intentionality of purpose, doesn’t make any sense with regards to computers. [5]

In closing, I would like to sum up the relevant ludic dimensions of this complex web of human and technical “actants” (Latour) that cannot be grasped with the idea of the “homo ludens” (Huizinga), but rather calls for a conceptualization as “ludic cyborg.” [6] The first ludic dimension of this human-machine interaction network that must be mentioned are the “affordances” (Gibson) of the PDP-1. The hardware offered a new mode of interacting with the universal machine that marks a radical shift in the philosophy of computer design: instead of focusing on maximizing the efficient use of computer cycles through batch processing and time-sharing it enabled users to interact with the machine directly, along different sensory channels in real-time. This shift in design philosophy imparted the technological artifact with ludic potential; unfolded within it an invitation to play that was joyously accepted by the first generation of computer hackers.

The attitude of the hackers toward the hardware is the second ludic dimension that needs to be underlined. They approached the hardware with a playful spirit. Hacks were defined, at the time, as autotelic endeavors that were performed for their own sake and the aesthetic pleasure they offered, as opposed to utilitarian tasks performed for some external purpose, out of a sense of duty or for a reward – the opposite figure to the hacker being the “tool.” This intrinsic motivation is a defining quality of play. Hackers such as Richard Stallman confirm the playful character of the hacking mindset: “[H]acking means exploring the limits of what is possible, in a spirit of playful cleverness. [...] Playfully doing something difficult, whether useful or not, that is hacking.” [7] The more playful shrewdness an endeavor exhibits the more ‘hack value’ it has. For no other reason than to satisfy a playful impulse the ludic interface pioneers not only reappropriated the universal machine in the form of the PDP-1 – turning it into the first ‘Playstation’ *avant la lettre* – but also reengineered model train and military controllers in their striving to perfect the aesthetic experience of *Spacewar!*. The hackers realized the playful potential of the computer by interacting with it, not as a tool, but as an aesthetic and ludic medium.

The third ludic dimension that needs to be highlighted is the openness of the game program. From its inception onwards, *Spacewar!* was constantly modified. The code was part of the budding computer culture's commons and this unleashed a wave of collective creativity. The productive interaction among programmers that condensed around the game points to the community generating power of play; furthermore, it also implemented the highest ludic form: the transformation of the rules and the frame of play.

The final ludic dimension that demands foregrounding is the deterritorialization of play space that occurred around *Spacewar!*. The line demarcating the sphere of work and the sphere of play – a strict division formatting our culture over the last 200 years – began to dissolve in the development of the program: the hackers played while working and worked while playing. In light of limited computer resources and the paradigm of time-sharing under which they had to work, hackers of the first and second generation used every free hour of the mainframes they had access to. They had to use these expensive machines when 'serious' tasks were not being run on them. Thus, the customary rhythmic alteration between daily work-time and nightly recreation was quickly suspended. At the same time, the hackers took a liking to programming during late hours, because they were more conducive to fusing with the machine code in inebriated hacking marathons and achieving a state of "flow" (Csikszentmihalyi). In short: their activity pattern subverted traditional 9 to 5 rhythms. Places like MIT's Electronics Research Laboratory, Xerox PARC or Stanford's A.I. Lab (SAIL) were places where the separation of work and play was undermined during the emergence of popular computing. Or as Les Ernest, the director of SAIL stated: "Sometimes it's hard to tell the difference between recreation and work, happily." [8] Here, for the first time, a playful labour or "playbour" [9] paradigm emerged that has continually unfolded and gained currency up into the present, parallel to the exponential growth in playful interaction with the universal machine. This expansive tendency of play in digital culture – which can also be seen in the rise of alternate and augmented reality games, time consuming online game worlds and full-body kinaesthetic interaction – calls classical ludological theories (Huizinga, Caillois, Bateson), which put their emphasis on the distinct demarcation of the ludic, into question and draws our attention to the transgressive productivity of play.

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THINGS TO DO IN THE DIGITAL AFTERLIFE WHEN YOU'RE DEAD

Dan Buzzo

There are currently few procedures or public awareness about what happens to online digital identities after death. This paper discusses what happens with personal electronic information after death and looks to what is argued to be the rapidly approaching digital Afterlife. This afterlife of new emergent behaviour offers a challenge of almost unimaginable scope to the creative vision of Artists, Philosophers, Technologists and Cultural thinkers.

Introduction

As more people live increasing amounts of their lives online the issues associated with physical death in the digital realm are becoming pressingly visible. Year by year deceased users leave behind petabytes of seemingly 'immortal' data. Yet despite growing amounts of such legacy data there is currently little legal or cultural precedent as to how to treat the personal data of dead users.

"five billion images and counting on Flickr; hundreds of thousands of YouTube videos uploaded every day; oceans of content from 20 million bloggers and 500 million Facebook members; two billion tweets a month." [1]

"One and a half million Facebook users die each year. Twitter faces a similar mortality rate. It's a growing problem for the social-networking sites - and often even more so for the relatives left behind." [2]

"We feel comfortable saying that 375,000 US based Facebook users will die this year and nearly 1.5m will die worldwide. That's 3 per minute!" [3]

The industry giants have, it could be argued, largely ignored or evaded the discussion of how to deal with legacy data. An early indication of this may be the tragic case of L/Cpl Justin Ellsworth. A US Marine killed on active duty whose parents fought Yahoo! Inc. in Oakland County Court. Their fight was for the right to their son's correspondence whilst he was posted overseas. Yahoo! argued that their terms and conditions prevented transfer of any users account, even after death. The court ruled in favour of the Ellsworth family and Yahoo! were ordered to hand over all data. [4] [5]

Historical dealings with the issues of legacy, inheritance, privacy and ownership associated with personal data in the social media arena has been subdued at best. Many of the businesses involved have as their financial lifeblood the 'positive externalities' of users interactions with the, largely free, services and tools they provide. Tools that are eagerly consumed by billions of people across hundreds of nations.

In recent years, however, the issue of legacy data has become more visible in the public consciousness. Correspondingly there are a small but increasing number of tools and services, waiting to serve what can only be seen as a significant growth market. Tools helping people deal with the issues of legacy data online. From mydeathspace.com, amongst the first to gain public notoriety, to the recent entrant to the arena legacylocker.com. LegacyLocker, for a fee, will hold your digital passwords and essential documents in preparation for handing them over to your nominated executors after your demise. Their ser-

vices even afford you the ability to send personalized messages after receiving confirmation of your corporeal end. Similarly, Entrustet.com offer a variety of services to the living to help manage their data after death including AccountGuardian and seemingly conversely AccountIncinerator. The latter delicately described to be useful so that;

"My family won't have to spend time deleting my online accounts after I pass away. I want my friends and family to remember me for me, not my Facebook profile" [6]

There are an increasing number of writers and commentators investigating the area of user death, legacy data and the persistence of our online expressions. The primary focus of many discussions, however, deals solely with concepts of legacy and inheritance. Whilst there are many significant issues to address regarding the peculiarities of data some experts argue that there may be ample social, cultural and legal precedents to deal with the issues of those that pass away, the people that survive them and how their effects, chattels and assets are dealt with. After thousands of years the legal and cultural framework for dealing with the inevitabilities of death are generally well defined. Though the issue of legacy data is new it may be that the current difficulties experienced by surviving friends and relatives of deceased users will be diminished as the legal establishment slowly moves to accommodate this new phase in social existence.

One amongst the new 'Digital Legacy' discourse is Digital Death Day. DDD is an annual celebration and discussion of all things digital and 'end of life' and this years conference in Europe is billed as;

"...primarily concerned with provoking discourse around the social, cultural and practical implications of Death in the Digital World. Thus stimulating a reconsideration of how death, mourning, memories and history are currently being augmented in our technologically mediated society." [7]

and the suggested professionals that should attend include;

"Funeral Director, Data Systems Admin, Digital Designer, Grief Counselor, Solicitors and Barristers in Intellectual Property and Estate Law, and Clergy." [8]

Previously a more unlikely attendee roster could scarcely be imagined.

Digital Death Day is one of several initiatives bringing public and academic questions together with business commentators. The objective, to create meaningful dialog and document good practice when dealing with the basic problem:

Users Die

When looking at the current state of discussion regarding issues of mortality and persistence of personal data there is a lag between the academic sphere and the general public discourse. Looking at issues associated with data persistence and legacy there is a proliferation of articles and opinions being expressed within mainstream media.

The nature of how, where and why this data is created captured and stored. Also the relationships that the public has with the, largely, monolithic organisations that started the trend of ubiquitous data capture are under review.

Understanding of 'personal data', its' complexity, its' persistence and its' inherent value in what is sometimes referred to as the 'attention economy' amongst the general public is increasing. [9]

Doc Searls from Harvard University argues further than this by making the distinction that there is a converse 'Intention Economy' when he writes;

"The Intention Economy grows around buyers, not sellers." [10]

Searls expands this idea in the area commonly referred to as VRM, Vendor Relationship Management. [11]

It can be argued that there is a burgeoning awareness of the nature of the hidden exchange that takes place with web service providers such as Google, Yahoo!, Facebook, Twitter et Al. The most dramatic illustration amongst the general users of online services surrounds that of ownership and administration of personal data. This is brought home most strongly with the situation of what to do with the digital expressions left by dead users.

Year by year as more of the general public begins to understand the depth and inherent value of their personal data there is an increasing impetus behind projects dealing with protection of personal data and the Portability and interoperability of personal data. This is both working alongside and a partial product of issues of privacy, estate and inheritance of personal legacy data.

VRM, Vendor Relationship Management is a natural counterpart to the ideas and practices of Customer Relationship Management (CRM) are beginning to reshape the argument around our relationship with service providers and our personal data. That the very data about our lives is no longer considered to be just 'a positive externality' for service providers of the interactions we have them but is something that is intrinsically valuable, both in a personal and commercial sense.

"VRM tools provide customers with the means to bear their share of the relationship burden with vendors and other organizations. They relieve CRM of the perceived need to "target," "capture," "acquire," "lock in," "direct," "own," "manage," and otherwise take the lead of relationships with customers. With VRM operating on the customer's side, Customers are also involved as participants, rather than as followers." [12]

"The primary theory behind ProjectVRM is that many market problems (including the widespread belief that customer lock-in is a 'best practice') can only be solved from the customer side: by making the customer a fully-empowered actor in the marketplace, rather than one whose power in many cases is dependent on exclusive relationships with vendors, by coerced agreement provided entirely by those vendors." [13]

The Berkman Centre for Internet and Society at Harvard University
(Harvard University, 2011)

Currently several projects and specialised areas of discourse are looking at aspects related to this area including, OpenID, OAuth, OpenSocial, VRM, (vendor relationship management), PDS (personal data spaces,) the Mine! Project, Identity Commons et al.

Approaches such as FOAF, Friend of a Friend, RDF, Resource Description Framework, and other related semantic technology approaches use data definitions to rigorously define relationships between pieces of information. With the goal of altering the outpouring of discrete pieces of digital content into a sea of congruent pearls of related, discernable, malleable information.

“FOAF is a project devoted to linking people and information using the Web. Regardless of whether information is in people's heads, in physical or digital documents, or in the form of factual data, it can be linked.” [14]

Though there is great hope for the future of the Semantic Web using technology approaches such as FOAF and RDF. There are critics of this technological approach to classifying everything with strictly defined taxonomies. Writers such as the American Cory Doctorow points out some basic realities that put a proverbial spanner in the works for an all encompassing semantic web particularly;

“When asking people to classify their own data –“People lie. People are lazy. People are stupid, know thyself is a tall order and people are notoriously poor at describing themselves and their own behaviour. Schemas aren't neutral. Metrics influence results. There's more than one way to describe something “ [15]

Next steps

When one looks at the state of legacy data, that is information and processes set in place by living users who have subsequently died, it is interesting to see this from the standpoint of the ‘post human condition’.

British writer Robert Pepperell in his 1995 publication ‘The Posthuman Condition: Consciousness Beyond the Brain’ argued the point that ‘Consciousness is not restricted to the brain.’ and that ‘Consciousness is the function of an organism, not an organ.’ [16]

From a PostHuman standpoint the ‘us’ of who we are is not contained within our skin, the concept of our identities is fuzzy at the edges and permeable. The ‘Who’ of who we are is a function of the expressions we make during our lives. For generations we have been extending the nature of our identities initially with simple tools and mechanical devices to extend our bodies and presence and latterly with ways to extend our minds. We can record and store our thoughts and memories externally for later retrieval with photography and text. With writing our presence can travel through time. We can even express simple decision making capabilities and behaviours that operate for us external to our bodies, in the digital realm.

It is this new ability to express capabilities and behaviours external to our bodies that is the one of the truly exciting new development of recent humanity.

It has been noted that we are entering an age of ‘Personal Automation’. Where simple cognitive and decision-making processes and functions are being externalised and automated; Using networked, digital technologies we are now able to offload parts of our behaviour to external subsystems.

Living digitally

Previous generations have lived on after their deaths though the extensions of their selves generated during their lives. People alive today have personal experience of William Shakespeare and have 'met' (albeit in a very small sense) Henry VIII, King of England in 16th Century. Part of who they were (corporeally) lives on through the expressions they made during their lives. We can still interact with something of them but just like the media they incorporated into themselves and their expressions thereof during their lifetimes, their ongoing presence is 'passive'.

DIGITAL IS NOT BY ITS' NATURE A PASSIVE MEDIUM.

As people express more and more of themselves in a digital, active medium I believe that there are direct, observable phenomena starting to occur within the digital realm. These phenomena point to what could be something radically new in human identity. Simple emergent behaviour is already happening as people begin leaving active digital expressions online after their deaths.

As Meredith Chin, Spokeswoman for Facebook says in her interview in Jenna Wortham's New York Times article "As Facebook users die, Ghosts reach out" [17]

"It's a very sensitive topic, and, of course, seeing deceased friends pop up can be painful." Given the site's size, "and people passing away every day, we're never going to be perfect at catching it"

James E. Katz, a Professor of Communications at Rutgers University, said the company was experiencing "a coming-of-age problem." "So many of Facebook's early users were young, and death was rare and unduly tragic," Katz said. "They don't want to be the bearer of bad tidings, but yet they are the keeper of those living memories," [18]

Perhaps it is these simple expressions of post corporeal identity that are so sensitive. Reflecting directly as they do in the living's memory of other physical beings now gone. Even in everyday colloquial parlance we are acknowledging this digital persistence and altered state of being. Lauren Laverne, a daytime DJ on 6music, a UK national radio station, talked recently of how she had been enjoying following Kurt Vonnegut on his twitter feed. Vonnegut died April 11th 2007.

Ironically on 21st August 2011 he/it tweeted "It is a very mixed blessing to be brought back from the dead"

Although these and other simple 'emergent behaviours' can be identified as basic processes I am convinced that they are a real and new as yet unquantified space & state of being identity. Exactly the issue that drives FB new policy of 'memorialisation' is the behaviour the points to evidence of an emerging 'afterlife'

THE EXCITEMENT IS IN THE POTENTIAL

The area I believe is directly related to these issues of legacy and inheritance stems directly from the problems that digital legacy seeks to address; that of persistence of our digital expressions and particularly with the 'active' nature of these digital expressions.

Stories of 'friending' suggestions for dead users on Facebook are legion, and parts of its recent policy on deceased users attempts to staunch the questions this raises. Tweets from the last.fm accounts of those no longer living or other similar behaviours from our surviving digital selves can arouse both confusion and alarm in equal parts from those still in a deceased users social circle whilst those online with no knowledge of the person's passing will initially see little difference in behaviour.

When looking from an evolutionary perspective perhaps this is v1.0 of what we might come to think of as a 'digital afterlife'. After a hundred years when we reach v75.0 we may see it as the embodiment of a real digital afterlife. Not one where people continue on as the same identity but rather as a transition phase in being with a relationship to the corporeal much like to a butterfly to a caterpillar.

This rapidly approaching digital Afterlife offers a challenge of almost unimaginable scope to the creative vision of Artists, Philosophers, Technologists and Cultural thinkers. This paper outlines some of the challenges and opportunities that are on the horizon in a current, near and far future context.

In our collective imaginations future ideas of a digital afterlife are ever-present. In art, religion, literature - seemingly all cultural arenas the question of 'what happens next' has been with us since time immemorial. In almost every aspect of 'future fiction' there is an element of persistence or even new existence after corporeal end. Ideas and concepts of 'the other' and post corporeal transcendence are deeply embedded in the human psyche. Perhaps this is the beginning of the realisation of some of these dreams and desires.

The current generation of digital natives have new and subtly altered perceptions of the personal, the social, the political, the economic and even the physical. Why not also the corporeal ?

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THE WOMAN'S I/EYE: 'IN-BETWEEN' STRATEGIES IN THE WORKS OF SHIRIN NESHAT AND TRINH T. MINH-HA

Monica Calignano

Starting with Homi Bhabha's definition, my aim is to explore the 'in-betweenness' of territories through the woman's I/eye.

Can women really cross the borders, and how do they achieve it?

The artists Shirin Neshat and Trinh Minh-ha give an answer to these questions in their visual works, where women finally break the silence and become the subject, and not the mere object, of looking.

In his introduction to *Nation and Narration* Homi Bhabha writes:

The 'locality' of national culture is neither unified nor unitary in relation to itself, nor must it be seen simply as 'other' in relation to what is outside or beyond it. The boundary is Janus-faced and the problem of outside/inside must always itself be a process of hybridity, incorporating new 'people' in relation to the body politic, generating other sites of meaning and, inevitably, in the political process, producing unmanned sites of political antagonism and unpredictable forces for political representation. [1]

According to Bhabha, nations should not be considered as unitary societies but rather as "interruptive" spaces. The meaning of every nation, of every culture, lies in what the postcolonial critic calls the "in-between space," between nations, frontiers and boundaries — "an international dimension both within the margins of the nation-space and in the boundaries in-between nations and peoples." It is thus a natural derivation that "the 'other' is never outside or beyond us; it emerges forcefully, within cultural discourse, when we think we speak intimately and indigenously "between ourselves.'" [2]

Bhabha's ideas are useful to understand the actual realities of migration and exile nowadays: every movement here involves a transition, through space and time, of people migrating from one country to another, and across boundaries. It is in the 'interstices' that today people – and artists – build their own home.

Women's art is not just predicated on the migratory movement; even more, it is what 'lives on' this movement.

Many women artists have recently turned to cinema or video-art and video-installations, in order to express their experience as migrants. The countless borders to be crossed everyday – geographical frontiers, frontiers between genders, and frontiers among different media – are experienced in a singular way, by artists such as Shirin Neshat and Trinh Minh-ha: these two artists are constantly in search of the right artistic dimension where women can speak – and write – themselves, by getting possession of the Western male gaze that has ruled them, in life, in society and in art, for so long. On her part, Shirin Neshat, when interviewed, repeats that she does not belong to any place, that she is a stranger and that she cannot identify any place as 'home.' Her "in-between" position belongs only to herself; as a consequence, her art is the way through which she seeks to reconcile with her past and her culture, so as to

open up, for women, the possibility of a dialogue. The position of Trinh Minh-ha is somehow different, but she is worried by a similar preoccupation: the Vietnamese artist reflects on the equation between the English words for “I” (identity) and “eye” (the organ of sight), in order to show how human identity asserts itself primarily through the act of seeing.

My question would then be: how does the female I/eye place itself in the “in-between space,” the space between different countries, and different media?

Strategies of counter-signing

In the works of Shirin Neshat, the frontier underlines what inextricably divides men from women in the Iranian society. She started as a photographer, before moving to videos and movies which, as she insists, gave her the chance to display the constant dualisms between East and West – and between women and men – in a more powerful way. In addition, video allows the artist to give voice to what, or whom, has been voiceless, making the unmoving finally moving. Most of Neshat’s videos are shot in black and white, presenting a two-channel-technology which is functional to the content of the videos; they draw a portrait of the Islamic society, especially focusing on the spaces occupied by men and women in this society. [3] In her videos – *Soliloquy* (1999) is a remarkable example – Neshat investigates the “third space,” – an expression she shares with Homi Bhabha – the space in which distinctions between different lands and cultures do not exist any longer.

Almost every work of Neshat is conceived as a big installation to be shown in museums and galleries: often consisting of two separate screens, one in front of the other, in a dark room, upon which the videos are shown simultaneously. In this way, the viewer, standing between the screens, is part of a process that involves his/her choice of choosing to watch one video or the other. In Neshat, we experience a frontier between two genders, and also a frontier between different media: as the artist affirms, multimedia languages are powerful, because they involve people and allow the viewer to become part of the work, by merging and contaminating his/her body with the video and the computer. Her purpose is to tear off the screen, and put the viewer at the center of the installation, often projected on more than one wall. The body is central to Neshat’s work, especially because, in Islamic society, the female body is the actual field where all battles take place.

This close relationship between the viewer and the image is particularly relevant to the installation entitled *Women without Men*, which was projected in February 2011 on the statues of Sala delle Cariatidi in Milan. In this exhibition, people move among the images reflected on the statues, in a multisensorial experience, as if they were part of the stories told by the screens. The installation consists of fifteen screens made of tulle, and it tells the stories of five women in Tehran, who gradually find shelter from their difficult lives in an enchanted garden. The screens do not follow a chronological order or a linear narration, they are randomly shown one after the other; this forces the viewer to move from one video to another, becoming the editor of the images, the one who puts them together and, in a certain way, who draws out his/her own story out of the images.

Jacques Derrida’s words seem to echo here:

By definition the reader does not exist. Not before the work as its straightforward “receiver.” The dream we were talking about concerns what it is in the work which produces its reader, a reader who doesn’t

yet exist, whose competence cannot be identified, a reader who would be “formed,” “trained,” instructed, constructed, even engendered, let’s say invented by the work. [...] The work then becomes an institution forming its own readers, giving them a competence which they did not possess before. [...] It teaches him or her, if s/he is willing, to countersign. [4]

The notion of “countersignature” is also fundamental in the work of Trinh Minh-ha, who in her own way explores the question whether it is possible, for women, to cross the frontier. According to Trinh, “a creative event is a journey”: the journey, with its meaning of ‘crossing,’ seems to play an important role in her career too: “West is, at the same time, inside and outside me,” she says. We all know that people who live on the border can see and understand things from different points of view; still, with Trinh, we also understand that these people can speak not only for themselves, but also ‘nearby’ the Other. The difference is crucial if we think that the artist actually began her career by shooting documentaries. In her work *Reassemblage* (1983), among the signs scrolling on the screen, we read: “I do not intend to speak about, just speak nearby.” The declaration of intents is polemical towards the way anthropologists and documentaries have always treated the subjects of their studies, that is, by taking the place that actually belongs to the subjects of their studies, and talking of them as if they themselves could not speak at all. To reverse this trend, and avoid any hegemonic position, Trinh decides to use the pronoun “I” without the capital letter. It is her way of stating that one can come close to something only in an indirect way, by letting things come over, without a pre-determined direction. This is the reason why she pays great attention to the role that speed plays in society: only by moving slowly, and by granting silence, are we able to play with the dimensions hidden in the interstices of the world.

In all fields, including language, there are multiple dimensions: one should play with all of them in order to create new meanings starting from old words and ideas. It is essential to work on silences, intervals, pauses, on the relationship between different things and different people. In this respect, Trinh Minh-ha proposes “a decentred narration made of intervals,” as Lidia Curti says. [5]

Furthemore, as Iain Chambers says:

Here on the threshold of vision that is marked by the elsewhere and its transitory exposure, the image comes undone, stutters, and for an instant is traversed by an oblique glance able to catch something in its unfolding. There exists the possibility to multiply on the image a multitude of senses, of directions, to rob it of unilateral intent in order to free it for a further movement. Here emerges a cinema of the ‘gap,’ of the ‘interval.’ [6]

Trinh locates her aesthetic vision inside the passage, the border crossing, the movement across space and time, the interval between life and death – in *Night Passage* all the subjects and the bodies are displaced, de-centered, un-done by the movement both of the camera and of the train.

Cinema — especially digital cinema — is a specific choice: because of its intrinsic mobility, it is considered as the most migratory art, and stands out as a transcultural phenomenon: movies can in fact be shown in different places and at different times. New media do not just help us collecting memories, by functioning as archives of what happens around and inside us; they mainly allow us to intervene: as a consequence, digital media are the most suitable to bear evidence of migration.

As in Neshat's works, in Trinh's movies, the frontier is there, even though sometimes only imagined: in Trinh's art, however, it seems more fluid, as if one might creep into it. This is remarkable in *Night Passage*, whose story is based on the novel *Milky Way Railroad* by the Japanese Kenji Miyazawa. [7] The film tells the story of a trespass, a crossing of the spatial-temporal dimension observed through a train window, and, more originally, through the I/eyes of women. When transported onto the screen, the male characters of the novel become female: under the eyes of the women, the 'gender frontier' crumbles away. According to the director, a change takes place when one repeats something by adding something new: thus, Trinh's work can be read, by quoting Derrida again, as her "countersignature" to the work of Miyazawa:

My law, the one to which I try to devote myself or to respond, is the text of the other, its very singularity, its idiom, its appeal which precedes me. But I can only respond to it in a responsible way [...] if I put in play, and in guarantee [...], my singularity, by signing, with another signature; for the countersignature signs by confirming the signature of the other, but also by signing in an absolutely new and inaugural way, both at once. [8]

Trinh seems to tell us that what is important for women nowadays is their ability of placing themselves across cultures, traveling and slipping across boundaries: exiling themselves, in the sense of soaking into new worlds, new experiences, new meanings. Still, *Night Passage* is not only Trinh's personal, totally female, countersignature of Miyazawa's book; it is "a spiritual journey of a young woman with her best friend and a little boy, into a world of rich in-between realities." [9] These realities are shown by means of a fragmented and deconstructive strategy: single episodes, single images framed as sequences, seen through a train window. As in her *The Fourth Dimension* (2001), the train serves as a moving and, at the same time, motionless frame, through which the human eye/I makes a sense of the reality. In this way, according to Trinh, "the gap between photography and cinema tends to become the bridge": the bridge that, once again, accounts for the importance of the infra-ordinary.

Starting from Miyazawa's story, Trinh leaves just the frame unchanged. Characters, who were formerly male, become female. On the night train, the young Kyra meets her best friend Nabi and Shin, Nabi's son – later we will find out that Nabi drowned trying to save Shin's life. During the night journey, Kyra discovers the "power of communication" and the bondage with Nabi, who supports her throughout the passage. Together, they run across the Fourth Dimension Railroad, a place of transit and movement where Kyra finds herself at the end: thanks to the journey, she becomes a woman able to leave her past behind her, and to move on; she learns the importance of going on, which is the rule of the *Night Passage*: "don't stop in the dark or you'll be lost; move to the rhythm of your senses, go where the road is alive." [10]

With her personal countersignature of Miyazawa's novel, Trinh seems to succeed in finding a common path where men and women can live, at least figuratively, one next to the other: she only needed to change the story by declining it to the feminine, so as to prove herself able to cross the frontier between genders.

On the contrary, for Neshat, it seems that there is no possibility of crossing the frontier, neither for men or women. What happens when such a division leads people – women – to choose, even unconsciously, exile in an enchanted place, a fabulous and magic place, where the real and the surreal merge? Neshat's movie *Women without Men* tells a fairy tale, based on the homonymous novel by Shahnush Parsipur, a story about the impossibility of a dialog.

Parsipur, like Neshat, comes from Iran but, unlike her, she cannot come back to her country where, because of her work — dealing with many taboo subjects in Iran, as prostitution, rape, virginity and reaction to male domination — she has been imprisoned and tortured several times. [11] In Parsipur's most famous novel *Women without Men*, the characters are strong women, who, at a certain point, take important decisions that lead them to run away from home — the place of their confinement — in order to take shelter in a garden outside Tehran. They arrive to the garden as in a trance state, walking as in a dream across silent and dusty roads. All of them will fulfill their destinies in different ways: some of them die and return to life, some disappear or transform into other essences, such as trees, wind or light.

In the garden of *Women without Men*, narration turns magic, the magic of a “non-place,” to use the French anthropologist Marc Augè's expression, which Derrida might call “a place to come.” For each of the five women, the garden becomes the symbol of their freedom from male control, the place where they are capable of reinventing themselves outside the boundaries of male society. In the garden, they are both at home, in a safe and domestic space, and free to live as they like. Still, none of them seems satisfied with living so strictly separated from the outside world, so neatly separated from men. Apparently what Parsipur is telling us is that living completely isolated, without men, is not the right answer: in order to be human, women must not try to exile themselves from the outside world, by taking a position of separation from it, but, on the contrary, they should find their personal answers, their own ways of living inside society rather than against it.

Nevertheless, the garden of *Women without Men* recalls me the words of Julia Kristeva in her *Strangers to Ourselves*, [12] where she seems to suggest that the feeling of being a stranger can only be abolished in a different dimension, an imagined and fantastic universe totally separated from the real one ... is that really so?

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TECHNO-HUMAN: NEW FORM OF HYBRID HUMAN; FROM SCIENCE-FICTION CINEMA TO THE POST-MODERN SOCIETY

Özgür Caliskan

This paper discusses the process of how human body and identity has become hybrid of human and machine being affected by technology and how this alteration has been materialized from science-fiction cinema to the post-industrial society. The term “techno-human” is used to define this new hybrid version of the human including implanted bodies, artificial organs, prosthesis, digital identities and avatars.

Introduction

Cinema has always been an art form which reflects what and how has happened in this world from the human point of view using various way of audiovisual communication to interact with the viewers; with us. Therefore, the questions and answers that people ask about everything have always been important for the cinema. Considering every film genre asks the questions and gives the different answers; according to Vivian Sobchack; science-fiction is “a film genre which emphasizes actual, extrapolative, or speculative science and the empirical method, interacting in a social context with the lesser emphasized, but still present ... in an attempt to reconcile man with the unknown.” [1]

In the post-industrial society, technology has become the unknown figure for our today and future, as technology and science improve rapidly. Every day, there are new machines and tools that we have to be exposed. Therefore, mainly, the role of SF genre has become exploring how these developments and tools affect human and what kind of interaction there is between human and technology. In other words, science-fiction cinema has had significant role as an art form to define and discuss the unknown and possible future of interaction between human and technology. As science-fiction cinema promises, today, in the non-fictional world, human being is exposed by machines; computers, mobile phones, the Internet, television, cars, prosthesis and any other machines. This new exposed human being is defined in theoretical and practical way since modern and post-modern periods have occurred.

Obviously, there are very important similarities between the human of post-industrial society and the represented human in the world of SF cinema in terms of physical body and personal identity. According to similarities of these two converted human being concepts; this paper aims to examine representations of altered human body and identity by technology in science-fiction cinema and how these representations have become real in non-fictional post-modern society today. In addition, the paper explains and uses a new term “techno-human” to define new hybrid human version which has similar identical and physical features with the represented human from science-fiction cinema and the real world of today. In the book “Terminal Identity,” [2] Scott Bukatman claims significance of altered human figure by technology in SF cinema using his own term *terminal identity* which is related with the identity of techno-human and Bukatman says: “terminal identity is a form of speech, as an essential cyborg formation, and a potentially subversive reconception of the subject that situates the human and the technological as coextensive, codependent and mutually defining.” [3] Considering the notion of techno-human, there is a strong relation between two human figures in SF cinema and the actual world; both are modified and their autonomies are awakened as Bukatman emphasizes the same for his *terminal* concept. Besides, to define the human of the post-industrial society, Giuseppe O. Longo uses the term *homo*

technologicus: “a symbiotic creature in which biology and technology intimately interact” and he explains this term as “homo sapiens transformed by technology” which is a new transformational type in a new space. [4]

In this regard, today, techno-human is the version of homo technologicus and considering these both definitions of Bukatman and Longo; -Bukatman’s is for SF cinema and Longo’s is for the non-fictional world- techno-human links these both notions concentrating on the alteration of body and identity by technology of human comparing with representation of the human in SF cinema. Furthermore, in structural meaning, techno-human does not only belong to the world of today or the world of SF cinema, it belongs to both of them; its area and time are also hybrid as itself.

Techno-body

The human body is reconstructed through technology in the postmodern period, and Stelarc explains this reconstruction as reposition of the body from the psycho realm to the cyber zone of interface and extension and he claims that the body needs this transformation to become the hybrid of human-machine. [5] In addition, to be exist and integrated in the world of techno-culture, one needs to improve his/her body but the nature does not help to regenerate the body. For this reason, the human is constrained to use the advantages of the new technology to accommodate the body for our own time and for the future. Thus, in the way of becoming techno-human, interpenetration between body and technology; one allows technology to penetrate into one’s body so the body is implanted, extended and altered by machines. Furthermore, Stelarc mentions that redesigning of the body altering, implanting and extending it ends with the redefining the human saying; “it is no longer meaningful to see body as a site for the psyche or the social, but rather as a structure to be monitored and modified (...) the body is an object for designing.” [6]

Additionally, techno-body might be considered similar with the cyborg idea of Donna Haraway, the cybernetic organism [7] and, the cyborg is generally defined as a presence which is a union of the cybernetic and organism at once, and also a blend of flash and inorganic. [8] Similarly, techno-body is a human body which is converted by technology, a new form of the human body, therefore, it is possible to say that cyborg is related with the techno-body and there is an interaction between both. However, specifically, techno-body approaches the machine and body relation involving the organic human body as the beginning point to discuss the techno-body in the conditions of the both fictional and non-fictional world.

In this case, the SF movie; *Repo Men* (Miguel Sapochnik, 2010), adapted by the novel of Eric Garcia, discusses the paradox of belonging and having the artificial organ in the near future which does not seem so far from today. Significantly, I choose this movie for the reason that it argues the artificial organs from the human body point of view; we see human bodies which become techno-bodies. In the future of *Repo Men*, one buys the artificial organs as same as today, and also if one does not have money; he can buy the organs with credits from a company. The buyer pays the instalment every month and if he does not / cannot pay the instalment, “repo men” take the organ back from him and he dies. This situation brings the question of belonging of the body with the artificial organs. Considering the movie, implanted body of techno-human does not belong to oneself concretely, and personally; one cannot feel that the mechanic part of the body belongs to oneself; the organ is just a new attached property of the body. If you have techno-body with the artificial implants, you cannot feel that your body does not completely belong to you like when you were born; inside of your body, there is something which makes you

have a techno-body; it is something implanted by technology, not by nature and physically, you are different than you were before. When the future of the movie is compared with our actual life today; it is possible to see people having techno-body with prosthesis and artificial organs. As people get used to lose their natural organs, they are getting used to have artificial ones inside of their body which will make them have a techno-body.

Robocop (Paul Verhoeven, 1987) movie is another example for the both fictional and non-fictional world for the reason that the protagonist of *Robocop*. Police officer Alex Murphy is human whose body is recreated with the machine prosthesis; *Robocop* had human body before having a techno-body. In this regard, *Robocop* movie can find its reflections and feedbacks on the real world immediately. *Robocop* brings a different perspective recreating the human body with machine prosthesis without covering it and also the movie shows the reasons and results of having a new machine body. Further, *Murphy* does not only come back to life, he also has improved and strong body than before so other police officers call him as “super-cop” also. In addition, without his new machine body, he also cannot live anymore, so he is obliged to his new body; he must have the techno-body to survive and his new body will not completely die, it just might be destroyed because it is a partly machine. This is also one of the contradictions of techno-human for the reason that any prosthetic parts of the body will not be vanished but the human will die and the human body will be rotten. Therefore, it is a contradiction of one is wearing something which will exist longer than one’s body. In addition, the shape of *Murphy’s* new body is not different than his former body functionally; it has still human body appearance with his two legs and two arms because the main reason of recreating his body is not to produce a new existence, the aim is to make a human body which is stronger than the organic one and he just becomes a hybrid and his new human shape body also bring the functional advantages to him, because he still looks like a human with the shape of his body. Likewise, in the society of today, if one has prosthesis, he/she is not very comfortable to take attention in the public because of the prosthetic part of the body. This is the reason why the prosthesis technology has to imitate of the organic body as well as the real and original one. For why, it is difficult to wear a prosthesis which is very different than the organic body because even just wearing the prosthesis has already possibility to make one a scary object in public; as it happens when the skinned body of *Terminator* (James Cameron, 1984) is seen on the screen.

Identity of Techno-human: Digital Me / We

The idea of Michael R. Heim; “Digital We – Digital Me” (DW / DM) is the initial point of the altered identity of techno-human from SF cinema to the recent day. I want to use the term for more general issues than just the digital environment covering the area of all technologically exposed new identity of human, thus, with the new identity of human. For this reason, DW is directly related to what has happened to human personality with the invasion of technology in daily life and penetration of the human into the digital world of machines. Evidently, the alteration of human identity is not caused by one way direction because when the machines exist in our daily life, we enters in their area too, hence, the identity is affected by its own environment and also the environment of machines; digital environment and virtual world. Significantly, becoming DW has been undeniable by the techno-human of the 21st Century for the reason that we live with the machines, inside of the machines and machines are inside of us.

Michael R. Heim gives the title of the poster of *Minority Report’s* (Steven Spielberg, 2002) “You can’t hide, - Get ready to run” as an example for the warning of DM of new human whose data profile is adapted by the computer with credit card purchases, online shopping, e-mail correspondence, health records [9] and today we have become closer to the DW with the social media/networks (Facebook,

Twitter) and blogs, mobile phones, video games and such. Obviously, we have alternative personalities inside of the machines and networks; they identify us as we introduce ourselves to them. For official usage of the digital technologies we have to become the real us but for other areas, our digital altered identity does not have to be the exactly what we are. DW/DM may be someone or something else different than our own. In this regard, Heim claims, "I" is transformed to "Me" being objectified in the virtuality. In addition, DM can be designed with "fake names, feigned interests, and fabricated references" hiding the real "I" behind the screen. [10] This is very much like what *the Matrix* (Andy & Lana Wachowski, 1999) brings the new idea of the combination of real and virtual world. Even we are not being penetrated by the cables to connect to the network with DM as it happens in *the Matrix*; we connect to the network with an altered identity. How the main character of the movie, Neo, is not exactly the same person in both virtual and real world, we have a digitized identity in the world of networks, or a video game. In this regard, it is possible to say that alternated identities have started when the computer has changed from calculator to the multimedia machine equipped with networks, games, and even televisions. [11] I mean, digital identity of techno-human has been created with personalizing computer and then use them as an entertainment and social device. In this process the non-fictional and fictional world of SF cinema has been developed concurrently and the boundaries between the DW and the real we has become more transparent.

As an illustration; in *TRON* (Steven Lisberger, 1982), the protagonist *Kevin Flynn* is transported from the real world to the cyberspace of the video game physically and spiritually, and if we think about the real time technology when the movie was produced, this transition from the real self to the virtual self is something new for the beginning of the 1980s. Almost twenty years after *TRON*, *the Matrix* brings another explanation to the concepts of real and virtual world and so the identity. Not like *TRON*, in *the Matrix*, the real body does not need to be transported to be in virtual space, the real "we" stay and the DW exist in the virtual area. Therefore, considering the technological developments in the world during twenty years; from *TRON* to *the Matrix*, it makes sense that we can have virtual identity without losing the real one. Obviously, the story of *the Matrix* is affected by growing usage of the Internet and virtuality on real life during the 1990s and the movie asks the question about the reality, and importantly; if there are two realities as the real and virtual one, where is the line between these realities?

When we consider more recent SF films, DW has changed, again with the development in the non-fictional world. Since *the Matrix*, 1999, also the deadline of the 20th Century, the virtual spaces and machines have invaded the space, everyday life and our body, rapidly, also the Internet environment and virtual space have played important role in our lives and virtuality has become popular such as social networks/media, blogs, video and photo sharing sites, virtual online games, video games and so on. In addition, "avatar" as a notion has become popular in the computing terminology and it is generally defined as the virtual representation of the user as a character on the virtual area. For this reason, the meaning of DM has been changed again as it is happened in SF cinema. For instance; the recent SF films such as; *Avatar* (James Cameron, 2009), *Surrogates* (Jonathan Mostow, 2009), or *Gamer* (Mark Neveldine & Brian Taylor, 2009) are generally tells the story about using the real avatars in the real world. *Avatar*, the human can control the body and identity of another existence, Na'vi, in the planet called Pandora, therefore Na'vi people's identity has become the avatar identity of the human. Similarly, *Surrogates* movie is about the future that people exist in the public with their surrogate robots so people just sit on the sofa and control their surrogates in daily life and in this situation people may seem different then their physical appearance or they may have different job than their real job. Likewise, in the future world of the movie *Gamer*, people play video games controlling the bodies of real people, for instance the main character *Kable / John Tillman* is a prisoner and he works as the avatar of the young boy *Simon Silvertan* in a game called *Slayers*. Further, to become an avatar is also a job to earn money in

the world of real people and real avatars. Without reservation, we also have had similar levels from the 1980s until today, and considering the recent movies that I have mentioned, not completely the same but we have our avatars in virtual area; we can control our avatars as we have different personalities and we can be someone else on the Internet. Michael R. Heim explains the notion avatar as “flexible and fluid identity that reveals chosen aspects of the real I. Avatars can range from the simple e-mail nickname with graphic icons to the animated body about in virtual worlds.” [12] It is maybe early to say that we can control other humans’ bodies as our avatars, but we control the machines now; cars, industrial machines, computers, and also with our body we control the our avatars on the game on Nintendo Wii or Xbox Kinect, however, for the issue of DW; the identity of techno-human is more significant than the body, because the identity does not need to wear, touch or hear something to be changed, it is just changed from the environment and surely, we have similar environments with the movies that I have noted. In this regard, if we can behave like someone else in virtual area, we already have our DW, and maybe in the near future, it is soon that we will see our DW in the actual life, just like looking to the mirror. In brief, if we finish with the words of Heim, he says; “the avatar becomes a graphic embodiment of the world citizen, the Digital Me that attains freedom through deeper engagement.” [13]

Conclusion

All things considered; techno-human is a notion to define new human who is exposed by the technologies and machines comparing the representation of altered human concept in science-fiction cinema with human concept in the post-industrial period of non-fictional world. The reason of my insistence to use the notion of techno-human is that we are not a completely machine "yet". In my opinion, the term has described the situation of today’s human better including the human word and also signifying the effect of technology (machines) on human body and identity. In SF films and actual life, the human becomes the first object to represent and for this reason all technologies I have mentioned are produced and used for human being. In addition, the human body is used as the represented realm to proclaim the future possibilities of the technology and human relationship asking a question which is that is this relationship good or bad?

In general, considering the dystopian SF films, their proclamation is that the machine and human interaction will grow negatively and there might be a so-called war between human and machines. As there are not any distinctive proof that the technology is good or bad for people, the term techno-human also covers the both effects of technology considering negative and positive results of human and machine relationship. As techno-human keeps the human parts physically or identically, he/she also is exposed by the technology using its advantages and disadvantages. In this case, techno-human might be someone who has prosthesis, or someone who sits in front of computer without doing anything, or someone who uses a technological weapon, or someone who walks around the city with his/her Bluetooth earphone. Therefore, including the words *techno* and *human*, techno-human becomes the hybrid, as it does not matter where he/she comes from, or where he/she lives in; maybe in the world of ours or in the world of science-fiction.

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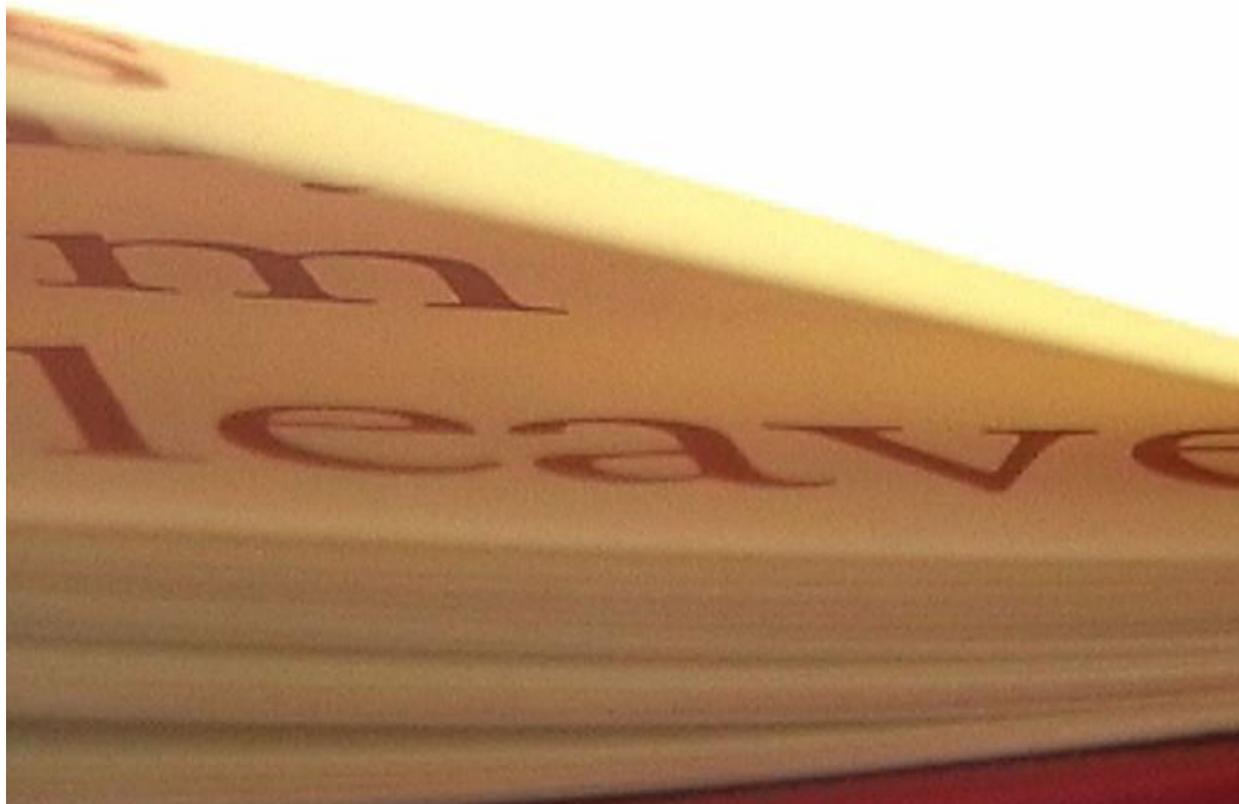
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COLLATERAL DAMAGE: CLOUDS, CRIMINALITY AND CHATBOTS

Sheena Calvert

This paper comments on language within digital technologies, regarding the application, modification, mutation and transformation of language(s) within such environments. It takes the position that the language(s) of technology, continue to be intimately entwined with philosophical questions about the nature of language, while in some cases extending and reshaping them.



Scripta Manent, Verba Volant, Sheena Calvert, 2002. Artist's book, exploring the various qualities of material language, and the philosophies which which address them.

INTRODUCTION

This paper is intended as a series of small remarks, provocations, or pointers toward questions of language within online, digital contexts. Although beyond the scope of this paper, there is a more detailed argument to be made that the ways in which language frames experience, identity, concepts, and political and social realities, in online and digital contexts needs to be thought through entirely differently; and that philosophies of language which are primarily locked into a fixed, linear, speech or print-based mode of critique, cannot account for, nor adequately address, the specificities and shifting realities of language within those environments. As Ludwig Wittgenstein reminded us, in the *Philosophical Investigations*, language games change depending upon context, wherein new rules apply. [1] What language

games are we now playing, and why? Nonetheless, the primary question always remains: how do language and knowledge and/or experience interact? What becomes provocative is considerations of which philosophical questions about language remain the same, and which change, once we enter these new information playgrounds and environments. In terms of power, social interaction, identity and languages' relation to consciousness, there are new agendas, higher stakes, and altered realities. For example, in her paper *Precairous Flux*, Donna Leishman argues that testing the porousness of the boundaries between language and reality takes on a new significance within online contexts, when 'tongue-in-cheek' Tweets become the subject of court cases, and move towards criminal action.

LANGUAGE AND CONCEPTS

Johanna Drucker, in her essay, *Digital Ontologies*, draws attention to one of the fundamental questions of Western philosophy; the relationship between linguistic signs and the representation of thought:

The attempt to understand the connections that link human thought to its representation through the act of formgiving (in language, image or signs) is central to Western philosophy and aesthetics. [2]

Similarly, Adorno's observation in *Negative Dialectics* that "[O]bjects do not go into their concepts, without leaving a remainder" [3] sets us on a path of thinking about the problematic and unstable relationship between language and the conceptual or physical reality it attempts to describe. Adorno suggests that language is a totalizing system which, unsuccessfully, attempts conceptual closure; and which in turn mis-directs, or suppresses experience, along with the evidence provided by the object itself. The question for this paper, and this research, becomes: where might we glimpse the kinds of linguistic 'remainders' he points towards, with their potential for revolution/redefinition, within the digital context? If objects of thought, are always more than their concepts (as apprehended through language); if they stubbornly refuse to be subsumed under such crude categories, then we might want to consider the many spaces and places within the 'digital,' where experience bleeds beyond the boundaries of the language used to frame or contain it. For example, the metaphors used to speak of intangible realities, such as 'Cloud' computing, arguably show the limits of language in matching either concept, or experience in digital contexts (later this metaphor will be explored as a version of the 'monstrous sublime'). However, where Adorno is speaking about the 'preponderance of the object' as something that breaks through the shell of the concept, what could be more immaterial, or non-objective than the digital? Leaving us to consider how we might use Adorno's ideas in this environment. I am indebted to Dr. Mark Walker for reminding me that when Adorno says, "[...] objects do not go into their concepts without leaving a remainder' what *concept[s]* are we talking about? [...]" Do concepts themselves change in the digital reality, and if so, how does language follow and explore this expanded notion of the concept?

Hegel thought that any kind of stable knowledge is an illusion. William Wallace translates his ideas in this way:

There is, in fact, a logical flux, a passing of contents tracelessly into one another, which is even more ineluctable and ultimate than the sensible flux from which it is so easy to retreat by an effort of abstraction. This logical passage makes it impossible to achieve the clearness, distinctness, and fixity which the Understanding desiderates, except for a limited range or span.[4]

In Hegel's view, thought cannot even rely upon the 'objects' of thought to stay fixed, still, closed, in order that it can perform its operations. There is always (despite our best efforts to contain it), movement, contingency, and slippage between the concepts, terms, and objects, which we apply our thought to; perhaps more so in an immaterial, digital space of infinite dimensions which operates in a state of flux and impermanence.

LANGUAGE AND POWER

The Situationist International's, texts on language and power, highlight the historical problem of language:

The problem of language is at the heart of all the struggles between the forces striving to abolish the present alienation and those striving to maintain it. [...] We live within language as within polluted air. [5]

In 1963 and 1966 respectively, The Situationist International and Mustapha Khayati published two articles on language and power within the magazine/journal *Internationale Situationniste*. The first, entitled *All the King's Men* offers a stark reminder of the ways in which language, in the grasp of authoritarian forces, does damage to the authenticity of human experience, by always designating something 'other,' in the servicing of capitalist ideology: "Under the control of power, language always designates something other than authentic experience." [5] The second essay, *Captive Words: Preface to a Situationist Dictionary*, goes further, in claiming that, in the contemporary context, thought is in danger of becoming subordinate to mathematical rigor, stripped of its insubordinate, poetic potential via the 'instrument' (and instrumental use) of language. Both texts reiterate the Situationist theme of resistance to such power moves by proposing a language, liberated from its role as information, and which recognizes and harnesses the fact that: "[Words] are not completely automated: unfortunately for the theoreticians of information, [they] are not in themselves 'informationist'; they contain forces that can upset the most careful calculations." [5] Johanna Drucker returns to this point, when she says: "In every generation, some version of this question has been posed: If it were possible to understand the logic of human thought, would there be a perfect representation of it in some unambiguous, diagrammatic symbol set of entities and dynamic relations among them?"

Acutely aware of the nuances of language, including being opposed to any use of the ideologically-infused suffix 'ism,' frequently attached to their name, the Situationists both recommended and enacted an aesthetic and political *détournement* of language, with a view to reversing the power relations implicit in its various forms. The contemporary question that leads on from their work, is not whether complexities of power and language still reverberate within digital, contexts (clearly they do), but to ask whether the terms of engagement around those power dynamics have changed? Do we need new forms of *détournement* for these new times?

The Situationists said: "News is the Poetry of power." During the recent riots in London, much use was made of the word 'criminality' within the media accounts of the events. This word, reflecting a historical notion of a criminal class, was used as propaganda for a right-wing agenda. Language brands and proliferates spontaneously within re-tweets and news articles. The language game is the same, but the extent and speed of its pervasive reach is infinitely greater than the Situationists could have imagined.

 LANGUAGE AND SUBJECTIVITY

Foucault, in *The Thought from Outside*, [6] argued that language is empty form. We fill it with subjectivity, but it pre-exists us, as a series of generic, non-particular entities. This is, perhaps, hard to think since we are always 'within' language, as we consider it. He says that the 'I' becomes our identity, but one born of an empty pronoun which lies in wait for a subject to utter it. We take over and bring alive the empty forms of language, with our subjectivity, but all language precedes *us*.

Only a determinate subject can animate the 'I.' We speak, we blog, we confess, we startle, we network, we dis/connect, through a language, which waits to be directed to a content, towards a goal. As Foucault reminds us, language, in itself, has an existence that is prior to its directedness; prior to its role in communication. It lies in wait, for a subject to inhabit it, and this strikes at the heart of simplistic notions of identity. The primary 'I' of language is impersonal, arbitrary, indifferent. The American Journalist, A. J. Leibling's statement that: "Freedom of the press belongs to those who own one" has been reconfigured and infinitely extended, to the limits of that concept, and beyond; transgressing a previous boundary, to an 'extreme.'

On September 8th, 2011, an article appeared in the online Telegraph, [7] outlining an experiment in which two science students had set up a randomized conversation between a pair of Chatbots, or online avatars/robots. Normally programmed to converse with a human being, the experiment involved them conversing with one another, during which the discussion quickly turned to the existence/or not, of God. What became compelling was observing where the breakpoints came in that staggered, awkward exchange; how the logic quickly broke down, and the nuances and subtleties of conversational form were lost; how inhuman it was, without being able to explain exactly why. These synthetic voices lack the timbre and richness of the human voice: their timing is fractionally, but significantly out of sync; lacking a human agent to recognize that subtlety.

It is a reminder that so much of communication is in the gaps, the spaces, the interstices, in the non-informational, non-informational attributes of language. Expression in language is the unmediated dimension of language: its non-representational, libidinal form (its excess). Language is much more than simple point-for-point communication.

When the Situationist International, in 1963, wrote: "Under the control of power, language always designates something other than authentic experience," [8] Bell Labs were automating the human voice, forcing a new space to open up between writing and speech, in the poetry of code; one as fundamentally detached from authentic experience as it is possible to be. This new relation between language and experience, between the subject and language, has only just begun to be understood.

Tone, timing, emphasis and modulation: these are all tiny, but essential pointers to the 'human' in language, where tone of voice, pacing, and emphasis is everything. We can tell an entire story with the nuances and inflections of our speech, and with the coded spaces between elements; we can convey disinterest, annoyance, empathy, control. How can coded language simulate these types of intramundane, to use Adorno's term for the significance of minutiae, details of our interactions? They require a sensitive and attuned human agent, to be constantly reading for signals, and a feedback system to be in place, which allows for the subtle interplay between signs and responses, space for error and adjustment; and the ability to inhabit multiple timings. Understanding is found in the far-from-seamless flow of such interactions, it's not a question of communication, but of 'listening' and 'hearing' differently; and of a

heightened sensitivity to the most miniscule deviations. What happens to these intramundane nuances of language in the digital space, and especially within synthetic speech and artificial language?

LANGUAGE AND THE SUBLIME

Adorno, in *Aesthetic Theory* remarked: “The feeling of the sublime [for Kant] is as a trembling between nature and freedom.” [9] Lyotard has talked about the ‘Sublime’ as that which invokes the unrepresentable, keeping open that which would otherwise be foreclosed by information technologies and by commodification. [10] For Adorno, Benjamin and Lyotard, concepts do not account for particularities. Whereas, the sublime recognizes the tension between reason and the imagination; between what can be understood, and what can be experienced. This form of difference involves the mind driving towards the limits of its abilities, toward the edge of conceptuality.

Kant, in *The Critique of Judgment*, makes reference to the ‘prodigious’ or ‘monstrous’ as being at, or exceeding the limit of, the sublime as a pure (immanent) magnitude. “An object is monstrous if by its magnitude it nullifies the purpose that constitutes its concept.” [11] In this sense, the monstrous can be seen to aggressively exceed and consume its own concept; courting self-destruction. This form of the sublime violates the commonality of judgments by exceeding our powers of apprehension. Cloud computing is a form of the sublime (monstrous) aesthetic, which exceeds the concept: libidinal, erotic, unrepresentable. It is immaterial and non-comprehensible in its potential infinitude. Clouds are (arguably), beyond representation; they are indescribable, limitless, exceeding their own concept. What could be more sublime than clouds? What could be more immaterial than the digital?

LANGUAGE AS CONSTELLATION

‘Constellation’ is Walter Benjamin’s term for the method of relating ideas in a montage of fragmentary, disjunctive, often temporally unrelated configurations, which nonetheless produce meaning by allowing unseen correspondences to emerge, instantaneously. In *The Origin of German Tragic Drama*, Benjamin explains the constellation as the place where:

[I]deas are not represented in themselves, but solely and exclusively in an arrangement of concrete elements in the concept: as the configuration of these elements... Ideas are to objects as constellations are to stars. [12]

Adorno’s understanding of constellation, which he borrowed from Benjamin, has been explained by Martin Jay as: “a juxtaposed rather than integrated cluster of changing elements that resist reduction to a common denominator, essential core, or generative first principle.” [13]

For Adorno, concepts (mental constructs, or ideas) are how identity thinking operates. In conceptual thinking, which wants to make a simple or generic classification of something thought, objects of knowledge are ‘blocked’ by such thought, from achieving their fullness. As part of this ‘classifying procedure,’ concepts profoundly prohibit knowledge of the object, and strip away what Adorno would term the intramundane: the particularities, or singularities; what makes an object what it is, but not in an essentialist sense. Conceptual thinking traps us into never seeing what lies beyond our concepts, in turn excluding the truth of things, and this is a major problem for thought, and a sticking point in terms of languages’ ability to provide access to truth.

His answer to this problem is that concepts should ‘enter into a constellation [which] illuminates the specific side of the object.’ Concepts block, while constellations illuminate; concepts limit, while constellations expand and proliferate. Concepts are uncreative, while constellations are creative, and constellations are process-driven, rather than limited by outcomes, or defined by pre-existing categories. The concept by itself, cannot *but* formalize, exclude (difference), freeze (in static time), and identify. However, all that needs to happen is that constellations are allowed to explode the myth of identity thinking; such groupings of thought as are provided by the constellation cause identity thinking to evaporate. Single concepts are displaced by combinations of multiple concepts, such that subjective thought replaces abstract identity. The online, digital space, wherein language is constantly in a relationship of constellation-to-constellation, may be the ideal environment in which to recognize the power of the constellation to explode identity thinking, and its limited conceptual apparatus for apprehending the richness and multiplicity of the ‘out there.’

COLLATERAL DAMAGE?

In conclusion, the question I wish to pose in this paper is simply this: if we are collateral damage to the continual influence (some might say ‘tyranny’) of language, how do we resist and rethink this, in the new information environments and playgrounds we inhabit? Moreover, if the persistent taboo which haunts language is making any attempt to stand outside it, in order to assess its influence, how do we break out of this double-bind? This transhistorical taboo consists of talking about language from within language. Arguably, there is no ‘view from nowhere’ that can allow us to speak about the ways in which language forms our experience, and our understanding, without using language. Even the most radical excavators of language (including Lyotard/Derrida/Nietzsche) have embarked upon this exploration from within the logic of the linear text/book, and the ‘laws’ of written/visual language.

How might we philosophize differently about language in a digital space? Perhaps Deleuze points to some possibilities. As John Rajchman explains, for Deleuze:

[P]hilosophy is not theory; it is an art of plunging into this peculiar zone of ‘the unthought,’ that destabilizes clichés and ready-made ideas, in which both art and thought come alive and discover their resonances with one another. [14]

We need mutually cooperative works of art and theory which consciously interrogate new forms of language in digital contexts, and ask searching philosophical questions, since in the end, these are ethical, not just aesthetic concerns.

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SHIRIN NESHAT'S WOMEN OF ALLAH: PHOTOGRAPHY AS THE LANGUAGE OF THE UNSPEAKABLE

Federica Caporaso

In this paper I'm going to analyze Shirin Neshat's photographic series *Women of Allah*, a work started by the artist when she came back to Iran after she had spent twelve years abroad, to find her country completely changed by the Islamic revolution of 1979. Through Neshat's work, I will try to explore the condition of estrangement of women in exile by analyzing the main themes the artist deals with in *Women of Allah* – that is the body, the veil and the written text – and I'll conclude with a very brief personal consideration on photography.

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The Body

Shirin Neshat's *Women of Allah* photographic series seem to echo (obviously unintentionally) Helen Cixous's essay *The Laugh of Medusa*, which dates back to the late 1970s but is still absolutely relevant. Cixous writes:

Woman must write herself: must write about women and bring women to writing, from which they have been driven away as violently as from their bodies – for the same reason, by the same law, with the same fatal goal. [1]

Although there are thousands of differences between the time and the cultural environment in which Hélène Cixous wrote her essay and that in which Shirin Neshat created *Women of Allah*, they share a common ground. They both deal with 'writing' and the female body, they both denounce the expropriation operated on women by their societies; the fact that they've been deprived of their own bodies and their own voices (Cixous talks about a theft) [2] and, as it seems by looking at Neshat's women, their firm will of defending what belongs to them (the weapons can be symbols of defense, in addition to being symbols of violence and submission). For both Cixous and Neshat, writing seems to be the most important step towards freedom.

As Neshat and Cixous demonstrate, the female body is a crucial theme for feminist discourse.

Sidonie Smith explains it in such an eloquent way when, in her work *Subjectivity, Identity and the Body*, she (like other feminists) speaks about 'embodiment.' [3] A woman is embodied when she accomplishes all the duties society assigns to her, which means to be a mother and to be devoted to domestic life.

This is such an effective expression because it stresses on the fact that society strongly reflects on women's bodies, not only morally, but also physically. Neshat's choice to write directly on women's bodies, to show and hide their shapes at the same time, makes me think about how a woman's body can be modified by a society's rules, and at the same time how it can be turned into a means of subversion.

The Veil

All the women portrayed in the *Women of Allah* series wear a veil (usually black, but also white in some photographs). Neshat, in her interview with Scott MacDonald, describes the veil as: "[...] extremely controversial, which have been considered both a symbol of repression and a symbol of liberation – resistance against the Western influence." [4]

The strong feelings Neshat's works convey make me think about Edward Said's essay *Reflections on Exile*, especially where he affirms that "exile is a jealous state." [5] Neshat's veils that completely hide women's bodies, and the weapons her *Women of Allah* hold, seem to be symbols of defense of Neshat's culture and heritage. She is 'jealous' of her culture, which has been stolen both by the Islamic revolution and by Western culture, with its mutilating interpretations of the Middle East. Furthermore, as far as her personal experience is concerned, part of her heritage has been stolen by twelve years far away from home.

Moreover, Julia Kristeva talks about the indifference and incomprehension a foreigner has to face, by stressing on how hard it is for the 'others' to penetrate his innermost feelings. [6] The 'others' can't understand that corner in the foreigner's soul, where memories are hidden, hidden with care and jealousy (or with anger sometimes), that corner in which the mother-tongue lays buried, [7] in which memories and dreams swim together, ending up being the same thing.

Kristeva describes her relation with her mother tongue by using these powerful words:

I have not forgotten my mother tongue. It comes back to me, – with more and more difficulty, I admit – in dreams. Or when I hear my mother talking: then, after twenty-four hours' immersion in that now distant sea, I find I can swim in it quite well. [8]

There is an unreachable place in the exiled soul, which can be both a source of solitude and of pride, a sort of loophole from which one can look outwards without being seen, penetrated, understood, with an ancestral awareness that empowers the gaze.

That is why I like to compare the exiled gaze to those peculiar windows called 'jealousies.'

Thanks to this kind of window, you can see outwards without being seen from the outside. You're invisible, but you can observe the others: invisible like any outsider in a society, but therefore able to look at the other in such a singular way they will never experiment.

Jealousy windows make me think about that 'double vision' every 'hyphenated identity' is endowed with, that ability of observing the world both from the perspective of 'others' and of himself / herself: to learn the gaze of the other, to think in two languages, to be drenched into two cultures.

This concept is expressed with such an eloquence and relevance by William E. B. Du Bois; in this famous quotation taken from *The Soul of Black Folk* he represents the distance between himself and the world that surrounded him by using the metaphor of the veil:

Then it dawned upon me with a certain suddenness that I was different from the others; or like, mayhap, in heart and life and longing, but shut out from their world by a vast veil. [9]

In some photographs, Neshat's veils seem to defend women from the world and from society, to preserve a culture threatened by the West; that seems to crush on a black veil whenever it tries to penetrate and understand the Middle East. It is the symbol of a distance, of a defense, and also of a double vision that makes Iranian women aware of what they want to conquer (emancipation) but without losing what is behind (and in) that veil, their culture and their heritage.

The Written Text

All the women portrayed in *Women of Allah* are covered with calligraphy in Farsi, added by Shirin Neshat directly on the photographs.

When Scott MacDonald asked Neshat why she had chosen to write in Farsi, she answered that, since she wasn't famous at the time, she didn't think about the audience, but she did the photographs for herself. [10] Moreover, when MacDonald asked her whether or not Iranians could understand those texts, she replied:

Yes, of course. Iranians not only could read and understand the meaning of the poetry but are also very familiar with the history and place of the writers in relation to Iranian society – something that would be impossible to translate to Westerners. [11]

The problem of language and translation is crucial to exiled people (or simply to foreigners), and obviously, even though one can be a master in speaking the 'other(s)' language, there are some things that can never be translated and that will represent a frontier forever (it can be surpassed, one can pass from one side to the other but can never erase it).

In her essay *The Other Language or the Condition of Being Alive* Kristeva says:

Immediately, but also fundamentally, the foreigner differs from someone who is not, because he speaks another language. Looked at more closely, this fact is less trivial than it appears; it reveals an extravagant destiny: a tragedy as much as a choice. Tragedy, because the human being is a speaking being, and he naturally speaks the language of his group, the national language. Changing languages is tantamount to losing something natural, betraying one's mother tongue or, at very least, translating it. A foreigner is, in essence, a translator. He may reach a point where he blends in perfectly with his host language, or only partially. In most cases, however, he is regarded as a foreigner precisely because his translation, however perfect it may be, betrays a melody or a mentality that is not entirely in tune with the identity of the host. [12]

Shirin Neshat proves to be deeply aware of frontiers, of those existing between languages, but also between the East and the West, between Women and Men. Her work very often represents a division between different 'universes' which cannot be surmounted (for example the barrier between men and

women in *Women without Men*). In an interview with John LeKay she affirms: “I see everything in the form of duality – paradoxical - in the inevitable cycle of life/death, good/evil, beauty/violence.” [13]

Sometimes, as in the case of those language frontiers, there is no chance to pull them down. The veil, the guns, the writings in Farsi are there to defend and to be defended against foreign invasion. Obviously, the West can (and must) try to have a look on the other side of the frontier, try to understand and never judge what it finds, but there is no hope to pull down the wall, and any kind of invasion will be punished.

When I think of *Women of Allah*, I am not surprised by the fact that Neshat used her mother tongue instead of English. After twelve years far away from home, to write all over her photographs (and, in a certain way, all over herself) the letters, which are so familiar to her, were a natural reconciliation. Moreover, it would have been useless to translate those poems. A Westerner wouldn't have understood: he/she would lack the cultural background.

Why Photography

When dealing with exile, with feelings estrangement and pain, I am always attracted to those artists who use photography to convey their feelings. Obviously, to express the unspeakable, it is easier to use images, as in Italo Calvino's *The Castle of Crossed Destinies*. [14] In the book, the main characters, after many painful adventures, bump into a castle and enter the building in order to find shelter. Since they are overwhelmed by the feelings of pain deriving from their tough experiences, they find themselves speechless. They have no words and choose to tell their stories by using images (tarot cards) instead of speaking.

In the case of photography, the result can be even more powerful. To take a photograph means to keep something that was once there and 'alive' and to capture it forever in the realm of stillness, from which can arise a feeling not that different from what the romantics called 'the sublime.' Photography is something that belongs to ghosts [15] and to mystery, as Susan Sontag writes: “Photographs are perhaps the most mysterious of all the objects that make up and thicken the environment we recognize as modern.” [16]

I think I can compare the effect photography can have on the spectators to that of masks. Masks are face-shaped objects deprived of what gives life to a face – the eyes, and the movement: that is why they are sometimes disturbing. They have the shape of something supposed to be alive, but are without 'life,' like zombies.

In my opinion, a photograph can be as impressive as masks and sometimes even disturbing: neither alive nor dead, the image depicted in a photograph contains itself the essence of the inexpressible, that capacity of awakening feelings of astonishment and anxiety able to arrive straight to the heart of the spectator

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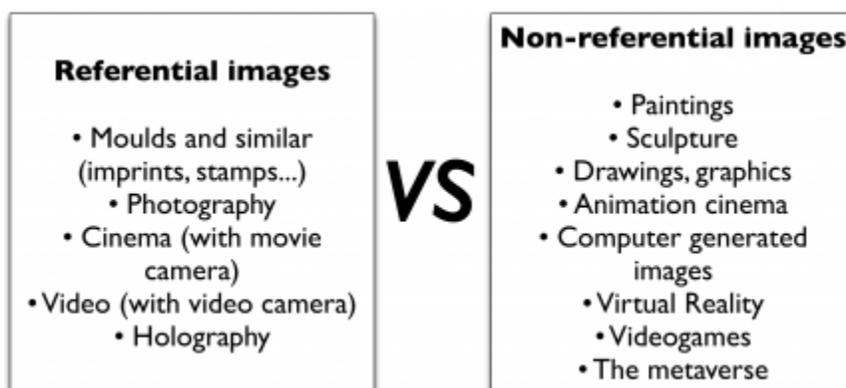
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SIMULATION BEYOND PERSPECTIVE. THE DISCOURSE OF HOLOGRAPHY AS A TOOL FOR IMAGERY, ART, MEDIA STUDIES AND SCIENCE

PIER LUIGI CAPUCCI

Holography suggests a visual universe in a culture where the visual simulation is the most effective communication system, and it allows us to reflect about a more comprehensive definition of “image”. Holograms could be more and more present in the communication systems, in a delicate balance between presence and absence, immediacy and remoteness, materiality and immateriality, matter and energy. However, they will require designing the right applications.



The two families of the images' realm: referential and non-referential images. A distinction based on how the images are obtained

A HISTORICAL FOREWORD

In 2010 the 50th anniversary of the L.A.S.E.R. invention was celebrated, while in 2011 is the 40th anniversary of the Nobel Prize awarded to Dennis Gabor, [1] the Hungarian scientist who invented holography. In 1947 Gabor was working in the microscopy realm, in order to make a light-made three-dimensional replica of a specimen that could substitute the original one, allowing the scientists to exchange it without any problems of degradation. Since the XIX Century the theories about the physics of light, and in particular on the interference of light waves, were achieved. However, unfortunately in 1947, no light source able to generate a monochromatic and coherent light existed, and Gabor, after repeatedly filtering the light of a mercury-vapour lamp, could only obtain a one millimetre square hologram. [2] Therefore, the holography-related studies and applications went into sleep for about 14 years, until the invention of the L.A.S.E.R. (Light Amplification by Stimulated Emission of Radiation).

The first functioning L.A.S.E.R. was operated in 1960 by Theodore H. Mainman in the USA. The L.A.S.E.R. can generate the highly monochromatic and coherent light for creating holograms, and in 1962 Emmeth Leith and Juris Upatnieks at the Michigan University in the USA made a transmission laser-viewable hologram, while Yuri Nikolarcvitch Denisyuk in the USSR created a reflection hologram viewable in white light. From this moment onward, visual holography exits the labs, and with the improvement of the re-

lated techniques and of the photosensitive supports, it can be used in many fields: from displays to publicity, from publishing to theatre, from art to security, from portraits to museums... Some early limitations in the original holographic process – for instance in the chromatic field, since the laser light has one colour and consequently generates monochromatic images – have been addressed. Since the early '80s, scientists and researchers have been experimenting on the holographic cinema and TV, [3] which in a few years will likely lead the holographic images to enter into our mass visual panorama. However, maybe this diffusion process will not be so plain because the holograms' peculiarities hardly fit into the ground where the everyday pervasive flat imagery is based on, and they challenge the way we make, use and enjoy the images.

THE PECULIARITIES OF VISUAL HOLOGRAPHY

Holography should not be confused with the so-called 3D techniques which are commonly used in the movies that are based on the stereoscopic recording and viewing processes: these techniques simulate the binocular vision and, unlike in the holographic process, they do not record and show the tridimensionality of the "real" space – which is a very complex issue – but only its depth. Moreover, holography should neither be confused with the pseudo-holographic applications that are called "holographic" because they involve 3D images, but indeed they are made with techniques that are not holography-based. The holographic images are light-based but with relevant differences from the other light-based images. A light wave is defined by two values: the amplitude (information about the intensity) and the phase (information about the periodicity). The images generated by the light's recording (photography, cinema, video) are commonly produced, reproduced and transmitted by the media using only the wave's amplitude (more precisely: the distribution of its square). In fact, since no material is able to record the phase in an absolute way, this information is lost, although it pertains the spatial dimension of an object. By means of holography, according to the physical principle of the interference of two coherent waves, it is possible to record the phase relatively to a reference wave with known phase distribution, in a process which freezes in the space the wave reflected by an object, that encoded in a static interference pattern can be recorded on a photosensitive plate. The holographic process records the encounter between the object beam (which is reflected from the object and, therefore, contains information about the object's surface and volume) and the reference beam (which only contains information about itself). It is indeed a very delicate process, with a lightwave-size space tolerance. When activated, this encoding (the interference pattern) can restore a replica of the original wavefront reflected from the object, so moving ones viewpoint in the wavefield, we can again see the object from different angles, with the sensation of its three-dimensional and concrete nature. [4] Holography activates a sensorial synergy between the sight and the touch, so that the real 3D holographic images, with total parallax, suggest the materiality of that space, of that object. The sense of touch, which is deceived, becomes the sense able to discern materiality from immateriality, physical reality from visual simulation (and this explains why holography is so interesting for the military realm).

Although it is possible to digitally generate holograms by means of computers, [5] holograms are primarily analog referential images. In the picture with this paper, the images' realm has been classified in two families, based on how the images are made and not on what they represent. They are 'referential images' and 'non-referential images'. In the first category, the images can only be obtained in the presence of the referent (from the Latin *res ferens*, which means "that carries the thing"), namely of what is represented. In this category the presence of the subject, object or phenomenon during the image making process is mandatory: without this 'being there', in front of the camera objective or the photosensitive plate, there is no image. Recalling Roland Barthes, in front of a photo we can never deny that the

represented subject, object or phenomenon ‘has been there’, for some occurrence, in some time of its existence, in front of the photosensitive plate. [6] The image is generated by that presence (that ‘being there’) during the image making process, it is some sort of emanating made by the light action and the chemicals and/or the physics. On the other hand, in the ‘non-referential’ images that co-presence is simply neither mandatory nor relevant in the image process making.

Holography can create an accurate visual simulation, with total parallax: a replica of the real object, made of light which has the real object’s visual properties but is immaterial, intangible. Holographic images are volumetric and can exist in a real and measurable space. While all the other imaging techniques that simulate reality are based on the Renaissance perspective, holography is not. The Renaissance perspective can represent the three-dimensional physical space onto a bi-dimensional one. Starting at least from the Renaissance, the thrust for reproducing the way we perceive space has played a key role in western culture. Although the perspective was invented in the third decade of the XV century – the work of Filippo Brunelleschi and the treatise *De pictura* by Leon Battista Alberti [7] – we are still immersed in (and influenced by) this way of representing and seeing the world. In fact, the perspective was inherited by photography, cinema, video, computer photorealistic images, virtual reality, 3D videogames, the metaverse: we live in a perspective-based culture. However, although the perspective is presented as an “objective” visualization technique, its objectivity is theoretically and technically based on the “point of view”, that is on the most subjective and personal element. Moreover, moving away from that viewpoint decided by the image-maker means losing information. Hence, we could affirm that the images performed by most of the modern and contemporary visual communication media are suited to a static and spatially privileged viewing position and to a substantially passive attitude of the viewer.

Holography gives more freedom to the observer: in front of a hologram we can choose the viewpoint and our spatial position, we can successfully change our own visual perspective, such as in front of a real, material, object and scene. Unlike the perspective-based images, moving in front of a hologram we acquire, instead of losing, information, and this activity on the viewer’s side can never be eliminated.

HOLOGRAPHY AND THE MEDIASCAPE

Holography stands apart from the media realm, it represents an exception that in part explains the difficulties of this technique to emerge and integrate into the mediascape, where all the other visual media simulate through the perspective using the same, although simplified, rules of the Renaissance perspective.

The media can produce, reproduce and transmit bi-dimensional images on flat supports. While in the holograms, the shape of the image and the shape of the support are different (in most holograms bi-dimensional supports display three-dimensional images), the usual images are morphostructurally dependent on the support: they have the same shape of the support. This allows an easy convertibility and circulation of the images among different media platforms. For instance, an analog photographic image can be digitized and transferred to a computer screen, to a movie and a TV program, it can be printed on paper on posters and journals, without any fundamental loss. Conversely, taking a photo of a hologram means flattening it, and so eliminating its peculiarity. Presently holograms cannot be translated into the language of the other media unless erasing their uniqueness, they can only be displayed through their direct exposition, they cannot be remediated. [8] The current media system have a high coherence and the images that it performs share similar morphostructural rules, so they can be easily transferred from

one medium to another without any fundamental loss of information: bi-dimensionality and image-support coincidence appear to be at the basis of this high level of compatibility, coherence and convertibility.

The mismatches between the holograms and the current mediascape are also evident in the fields of cinema and television. As said above, since 1983, there have been experiments in projecting holographic dynamic images and transmitting them in remote. Common cinema and television images are based on the perspective, and the spectator should be watching them from a precise viewpoint or area, which is situated on the perpendicular axe of the image at a distance from the screen which is a function of the image area (indeed we spontaneously choose this position in a cinema hall). The filmmaker chooses the perspective of the scene: we see the scene through his/her eyes, from the viewpoint he/she wants us to watch it from. He/she decides the frame from his/her personal point of view, which he/she proposes and then the cinema and TV language imposes it on the viewer.

As far as we know of the future holographic cinema and television, the classical figures of filmmaker and spectator could undergo a great transformation. The spectator could look at the image moving around it as if it were a sculpture, or he/she could be able to move his/her head to observe a background partially hidden by a close-up face, or an actor's profile: a totally different spectator from the passive one of the usual bi-dimensional narration. The filmmaker, whose narrative art's centrality would break up, could employ new exciting expressive opportunities to offer the spectator more topics, viewpoints and information to enjoy. The few spectators of the first 47-second monochromatic holographic movie, made in 1976 by the Russian scientist Victor Komar, tell that they could see a young woman holding a bouquet of flowers. At a certain point, she went out of the cylindrical screen and moved around in their space, and they could move around her and see her from different viewpoints. [9] Like in the Elizabethan Theatre, the holographic cinema halls will not require the chairs for a frontal passive view because people will be able to choose the perspective they are interested in.

With the holographic cinema and television there are no more three dimensions (two spatial and one temporal) but four (three spatial and one temporal). Time is the physics quantity that is responsible for the image motion and metamorphosis. In the common visual media, this transformation takes place on a bi-dimensional space, the support of the image. This means that the human visual system is allowed an easy focalization which remains roughly steady in time, only needing simple and small adjustments (in my opinion one of the reasons in the failure of the 3D cinema in the second half of the Fifties depends on having disregarded these requirements, and in fact, today's 3D movies are not so invasive on the space of the viewer). Therefore, for the visual system it is very comfortable following quick camera movements, flashing running shots, and rapid cuttings. Moreover, because of their inner structure, the camera optics can resolve only some parts of the image, hence acting as information limiters, and furthermore the filmmakers can use them as a system for focusing the viewer's attention. In fact, resolving only some parts of the image implicitly means suggesting to the visual system to discharge the unresolved information, limiting the amount of the information to be taken into account. For these and other reasons, commercial spots, music video clips and action films can reach the human physiological limit in the perception of rapid image changes. The universe of the moving flat images that we are usually staring onto ones flat screens is a metamorphic calembour in constant, discontinuous and rapid change.

Conversely, a look at the real world through a window involves a process which is much more complex. Like in a hologram, there are no unresolved parts of that panorama, and since it does not lie on a flat screen, our visual system must focus many parts of it at different distances in order to comprehend the

image. Although the fast visual system adaptability, this adjustment activity requires time, and it should be noted that this example does not involve any dynamic situations, which would have greatly complicated the process. If we only consider these arguments, we can say that the fast rhythm of the bi-dimensional movies if applied to the holographic cinema and television would simply be too aggressive for the human visual system. The future holographic dynamic images will certainly be performed, but not according to the languages of the current communication forms.

Therefore, both in the static and in the dynamic fields there are many basic incompatibilities between holography and the current media platforms. These mismatches are not only technical and technological, but pertain the way we produce, use and enjoy the mediated communication: they involve the global mediascape consistency. It follows that holograms require new displays, new visual media, and new genres of communication, even if they hybridize with the existing media.

Holography suggests a new visual universe within a culture where the visual simulation is the most effective communication system; and it let us reflect about the need for a more comprehensive definition of "image". We can believe that future images will also be holographic and that we shall communicate more and more through them, in a delicate balance between presence and absence, immediacy and remoteness, present and past, materiality and immateriality, matter and energy. However, the volumetric images require designing the right applications. Holograms have only been around for fifty years, and they are so promising. Art, science and imagination are welcome!

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LUDIC STRATEGIES IN PUBLIC ENVIRONMENTS

Moisés Mañas Carbonell & María José Martínez de Pisón Ramón

Starting with a concept of environment not only as ‘what is around us’ but as the cultural and visual agents we interact with, it appears that situations and interactions between individuals and media content are building a new kind of citizen, a *gamified* citizen that needs strategies to cope with the curious order of public relations we call *ludocracy*.



Figure 1. Protest June 19th - 15M Valencia movement Spanish revolution.

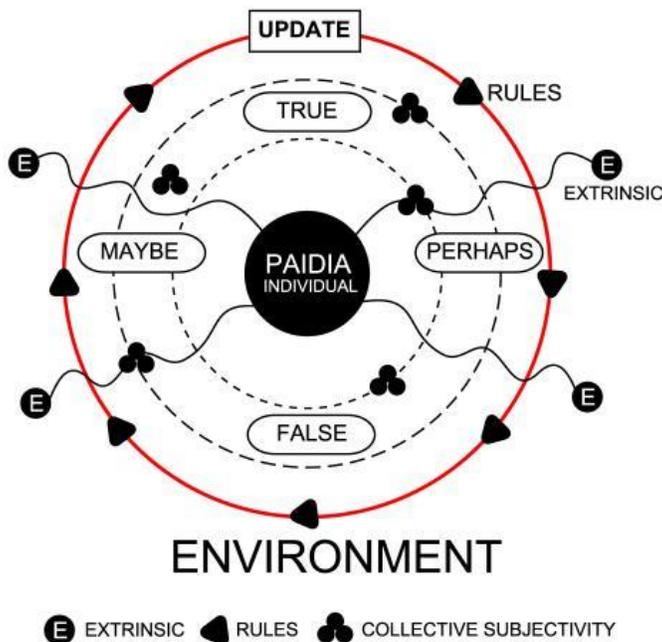


Figure 2. Ludic strategies graphic



Figure.3 Hibrid Playground, 2008, Diego Díaz, Clara Boj. Public space media interaction

1. INTRODUCTION. DESCRIPTION OF THE ELEMENTS OF THE GAME

This paper is presented as a panorama where we show the changes and issues that we have seen in the last few years in the relationship between the environment, art and game. To place ourselves in the text we need to clarify the meaning in which we will use these terms.

We understand "environment" not only as the atmosphere that surrounds us, but also on one hand as characteristics that come from the social and we consider this social environment mainly as "scenery of communication" and on the other hand, characteristics from the information technology field, defining the environment as a set of intrinsic conditions that are needed to make the system work, like the type of program, process or the characteristics of the devices that it consists of.

Let us focus on these word games that could come from these definitions, especially with: conditions, extrinsic, functionality, scenery and communication. From these terms we draw a graph, which is constantly moving due to the interactions that occur between them. The graphs shows movement from the outside to the inside passing by a variable of conditions, all with the fundamental need to work and complete a task in this communicative setting.

This visual model of the environment (Figure 2), which we suggest as functional, presents a variety of layers between the exterior and the space of the individual, in the exterior there are a set of rules that are updated from time to time. These set of rules are related to a political-social aspect and the coexistence that the scenery of communication suggests.

These rules and their variable mechanics define the game as the whole system that we call the environment. Inside this system we find outbreak of *Paidia* characterised by spontaneity, entertainment, destruction, human willingness that acts without ethical deliberation, [1] but this is only found intrinsically in the individual.

On the other hand, between the individual and the environment under rule, we find ludus "a play institutionalizes as a game." [2]

This "ludus" space maintains a relationship with the public. We understand the public from the definition of Habermas [3] as a process by which the citizens occupy the public sphere controlled by the institutional authority and they transform it into a *space* to criticise against the power.

As in the game, the process is more important than the object; the public is a continuity, a procedure which requires constant renewal.

2. THE ROLE OF THE MASS MEDIA WITHIN THE ENVIRONMENT

We saw in the definition the characteristics of the devices that make up the environment, influence in the conditions that the systems needs in order to work, we centre the role of the media in these devices.

The mechanisms of technical and conceptual devices that go beyond measuring the established communication, in the map of its developments and possibilities, the structure and ways of life in a community, its movements from physical to mental, adjusting the sense of sight and of hearing in proximity and distance, in real or delayed time, producing in only one direction as multi-linear and participative feedback.

"These lines of the mechanisms don't include or surround the system; each of them will be homogeneous on their own, (object, subject and language) but it will go in different directions forming unbalanced systems," [4] these unbalanced processes, these changeable directions can administrate and control knowledge, social practises, individual behaviours from these mechanisms (apparatus) of the state, the academy and the industry or consumption.

The impact of the media on the social fabric has been critically analysed by the Frankfurt school. With the passing of time we can see the hopeful position of Benjamin: to create an emancipation and to raise the awareness of the individual; like the perspectives of dehumanization, for the advancement of technological resources and the development of cultural industry that Horkheimer or Adorno presaged, they have drawn our present, hopeful but deceptive at the same time.

The mechanisms of control and the social machination continues to grow but the unveiling of its mechanisms, the access to its component and program codes, spread openly through the network generating a shared knowledge, a "wiki" of resources hoping that the individual will feel the desire to take action and think about the strategies that they should take to perforate these rules of the game, these mechanisms. We can act in the environment, in public spaces and know its conditions, function, setting and the means of communication.

3. STRATEGIES TO RE DEFINE THE RULES OF THE GAME

The latest social transformations which has taken place mainly in Europe have revealed some of the rules of the game, showing gaps in the social cohesion, levels of inequality or dark tunnels; the disappearing of homogenous spaces of well being have given way to new territories that the citizen has to discover.

Where to do we place ourselves on this board game?

The individual as a citizen see that "...the urban becomes what is always was: a place of desire, of permanent disequilibrium, and the seat of the dissolution of normalities and constraints, the moment of play and the unpredictable." [5]

And confronting this situation we establish new ludic strategies on different levels:

The first level of strategies include among others:

- The need to share the game: multi players. With the idea of not only sharing but creating collectively. [6]
- Take back some of the rules that are established by the system: Social networks. Using them as a witness to the actions that happen in the game.
- "That's true, Benteley agreed. After a time he said, No, there's no point in playing a rigged game. But what's your answer? What do you do when you discover the rules are fixed so you can't win?" [7]
- Generate new rules for the game. Build new media, with the intention of developing tactical strategies.
- "You do what I did: you draw up new rules and play by them. Rules by which all the players have the same odds. And the M-game doesn't give those odds. The M-game, the whole classification system, is stacked against us. So I said to myself, what sort of rules would be better?" [7]
- Play with the rules. Take the position of the joker to develop an in/out strategy in the actual system.
- Create low cost devices towards the democratization of the actual system.

The second level of ludic strategies placed:

- A new use of festivities and celebrations as a strategic switch. Profanity of sacred public spaces, [8] and public shows. [9]
- A rebalancing of the auditory and the visual. Suggesting the resonance as a relevant leader in the performative activity.
- Reusing the protocols and systems of symbols as a strategy to learn the game quickly.
- The re conquest of public transit spaces (squares and gardens) as play areas. Political game, economic and social.

And these strategies can give way to:

- Renovation of the significant potential of symbolic forms.
- Use of the route (path) as a graphic adventure.
- Reconversion of transit spaces in areas of consensus and public debate.
- Democratization of media.

- Search for Ludocracy. Reconstruction of the game from the consensus and little by little from all the players.

4. ART AS A FUNDAMENTAL STRATEGY

Art has the ability to bring together the rational and irrational containing a field as wide as the game. *Paidia* and *ludus* find space in art. The strategy, calculation, intuition or experience build practise that make us aware that we are playing and not just see and also interact in the “first person.” [10]

For example, “N55 rocket system” from the collective N55 is a low cost homemade devise made with functional and symbolic elements: the rocket is propelled with a mixture of polyethylene and laughing gas. This devise greatly increases the basic elements of protest, from seeds to texts; acting for example in one of its interventions, against Monsanto herbicide in a way very similar to how the industry operates in the air. The rocket spreads the seeds from a height of 5,200 meters. With this proposal the importance of generating new ways to intervene and use tactical strategies becomes evident.

The artistic practises that give new visualising systems can transfer stimuli to spectacular situations or small personal screens. For example, *Cell phone disco* (2006) by Ursula Lavrenčič and Auke Touwslage turns a personal device like a mobile phone into a collective ludic activity by visualising on a LED surface the electromagnetic waves that the telephones use when they are active.

On the other hand, Haruki Nishijima, in the piece *Remain in Light*, look for and capture analogical waves in urban spaces so that they can later be visualised in an exhibition space, the forms that they generate as perceived as extinct elements like what happens with the fireflies in Japan.

Against these low cost practises there are others that have a spectacular visualization system like *Body Movies* (2008), by Rafael Lozano-Hemmer, that project in public spaces, the shadows of the pedestrians in great so that they reveal images that were previously taken in the city.

Also, *Lummo Blocks* (2010), by Lummo (Carles Guitierrez, Mar Canet and Jordi Puig) and Javier Lloret, project a version of the Tetris game on the façade of the Medialab-Prado in Madrid in which the pedestrians can play interacting in a coordinated way to control the movement and position of the pieces.

Another piece that intervenes in the media, redesigning the normal visualization system in the news, is *News Map* (2003) by Marcos Weskamp and Dan Albritton. This case maintains a ludic relationship by means of a direct manipulation by the user themselves and under the parameter of the instantaneous news. It is relevant in this visualization what place the news occupies in these Medias and its level of relevance in the mediated society. The user has the ability to manipulate this system of visualization.

In this line of visualization, the example of *Grey in Men* (2010) by Julian Oliver and Danja Vasiliev, are highlighted in which they bridge the access point of wifi and camouflaged in the offer in public spaces (hotels, internet cafes...)

The locative games take part in a very direct way in the renovating of these ludic strategies, for example *Urban Codemakers*, (2011) by Troy Innocent, it is a game spread out on the streets of Melbourne

that through the creation of new iconic signs (ideotag) renew the language and culture through the game.

It is noteworthy to point out that, within these practises, *Hybrid Playground* (2008) by Diego Díaz and Clara Boj (Colectivo Lalalab) [Fig. 3] as an example of the re conquering of the playful urban spaces already existing in the urban space. Through mobile devices (PDA) the children not only play with the street furniture but also this furniture interacts with the video game installed in each of the children's' devises, creating a ludic experience between the physical and virtual, amplifying the classical playful spaces (playground) and reconverting it into an enlarged playful space.

These practises in the intervention of public spaces dissolve the limits of artistic space and dialogue, for example, with the behaviour of the *Skaters* as playful manipulators that find their board game in the urban spaces; or like *Parkour* (the art of moving)tracers of roads, trails, maps, territories, overcoming all the obstacles. There are no rules for the parkour and because of this it adopts a role close to *Paidia*, characterised by the spontaneity and fun while the skater assumes more the role of the joker, gambler or jester with the rules of the game.

These and other types of subversive practises that are not aggressive to urban spaces, like *street chalk message* or the *guerrilla sticker*, reflect creative ludic strategies that waver between the field of art and the urban, where the role of the players are based on the reconquering of the public space as a critical game.

5. CONCLUSIONS:

Returning to the idea of public space by Habermas, [3] we can sense this scenery of communication like a porous sphere that takes on the themes and contributions of all the players, a space in which we can make a new turn to recuperate the public debate culture, lost through its transformation in the culture of public consumption.

And resuming the idea of ludic strategy of profanity through the game Agamben, the citizen is freed from the rules of the institutional sphere, of what is sacred as he states, and he grants a new dimension of use: "to restore the game to its purely profane vocation is a political task." [8]

This environment that we propose is the correct place where we can generate communities of media producers through creative and ludic aspects. Throughout the text we have been collecting elements that shape this possible post- medial, redefining the role and extensiveness of the devises toward independent low cost systems and adopt as a tactical strategy the decision to act from the microphone without losing effective communication and producing a change of collective attitude by experiencing the game.

Its construction is feasible for the public distribution of free and open knowledge, growing outside of academic contexts under a more flexible and dynamic structure, and also by the diffusion of artistic practices that are outside the context of the art industry and establish an effective bridge to popular culture and street culture.

Have we already seen this present in the public sphere?

Perhaps more than its presence, we have seen its desire, embodied for example in the open and non-hierarchical structure of 15M with the re-adapting of symbolic forms and rules coming from other game systems (football red card=politician out of the game). Its system of communication is based on the effectiveness of the social networks, our desire would be that they were produced through independent devices as an answer to what Jose Luis Brea stated in 2000 "imagine the development of the independent devices that given their agility and presumed strategic effectiveness, will soon be able to rearrange the landscape of artistic mediations of experience." [11]

In these ludic devices, of action and communication is where we see the prints of ludocracy. Citizens' re-adapting of the rules of the game step by step and under its consensus.

Faced with a reality that we elude, but where action is possible, these strategies allow us to have a greater awareness of the effects of that representation, so that by analyzing the layers of pretense, rather than bend or fold it, we search in them points of symbolic escape from which individuals see everything as a graphic adventure because they are aware of the game.

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I WANT TO TOUCH YOU: TRANSREAL AESTHETICS IN VIRUS.CIRCUS

Micha Cárdenas & Elle Mehrmand

virus.circus follows the viral as a transversal line of inquiry that intersects with the militarization of medical authority, microscopic transnational migrations and global economic inequality. *virus.circus* is an episodic series of performances using wearable electronics, soft sensors and live audio to bridge virtual and physical spaces.



fig 1. virus.circus.breath, performed at the Museum of Contemporary Art, San Diego, 2010, photo by Ash Smith



fig 2. virus.circus.probe performed at Highways Performance Space in Santa Monica, California, 2011, photo by Frankie Martin

Due to recent viral outbreaks, protective latex barriers must be worn at all times.

Skin to skin contact may result in viral contamination.

Failure to comply will result in a minimum of 10 years in a federal penitentiary.

Touching, and illness, are prohibited by law.

The virus must be contained.

virus.circus follows the viral as a transversal line of inquiry that intersects with the militarization of medical authority, microscopic transnational migrations and global economic inequality. Consisting of an episodic series of performances using wearable electronics, soft sensors and live audio to bridge virtual and physical spaces, the performances explore queer futures of latex sexuality and DIY medicine amidst a speculative world of virus hysteria. The history of queer politics shows that the rhetoric of viruses such as HIV are used to control marginalized populations, while the response to viruses such as H1N1 reproduce these structures of power.

Transnational Inspirations

virus.circus was conceived on our flight back from the Hemispheric Institute of Performance and Politics Encuentro in Bogotá, Colombia, as we reflected on the inspiring performances we saw and the news of President Uribe's infection with H1N1. Deeply inspired by performances by La Pocha Nostra, Nao Bustamante, Tania Bruguera and Danza Contemporánea Integrada ConCuerpos, we decided to create a series of performances focused on an imagined future narrative where the virus hysteria of today and the resulting militarization of medicine in airports, hospitals and other public spaces, was even more omnipresent and legalized.

Living in the US/Mexico borderlands, living in San Diego and collaborating with artists in Tijuana, the effects of H1N1 were perhaps more apparent to us than in many other parts of the country. In April of 2009, the World Health Organization declared an outbreak of a new virus strain, Influenza A (H1N1), which raised great concern for its ability to move from pigs to humans.^[1] On April 30th of 2009, the government of Mexico declared a 5 day shut down of major parts of its economy, and we watched the streets of Tijuana completely empty of people as businesses suffered. ^[2] By June 11th of 2009 over 10,000 cases of H1N1 were identified worldwide and the World Health Organization declared it a global pandemic.^[3]

Our inspiration for *virus.circus* came from witnessing the intersections of the response to the virus with structural racism and control over people's movement. A notice to students sent out campus wide suggested three ways to avoid the H1N1 flu: "1. Use good personal hygiene... 2. Avoid close contact with people who are ill... 3. Avoid non-essential travel to Mexico".

[4]

The notice clearly reinforced structural racism against Mexico by choosing the ability to stay out of Mexico as one of its three main strategies for people to avoid illness, in effect making the students, staff and faculty who attend UCSD and live in Mexico invisible and secondary in efforts to maintain the health of the UCSD population. A second notice, sent only to a single research unit at UCSD said the following “A... researcher has a confirmed case of the H1N1 flu. He came into... to work on his research project yesterday, 10/14. He is now confined to his home until he fully recovers.” The implication here is that employers, in this case Universities, can choose to restrict the movement of their employees based on an evaluation of their health.

The political effects of the H1N1 virus resonate with the ways that the HIV virus was associated with gay men. As the performance “Let the Record Show” by Gran Fury / ACT-UP re-performed and documented in 1987, a disturbing confluence of religion and nationalism with homophobia was prevalent in the US. With *virus.circus*, we sought to revisit and explore the implications of virus politics by imagining a future world in which the precautions against a disease like H1N1, spread much easier than HIV, were a part of daily life.

Erotic Politics, Erotic Affect

virus.circus asks how erotic affect can be a form of resistance to hegemonic narratives of embodiment reproduced by western medicine. Our strategy was to show that the erotic could still be a form of resistance in a world controlled by virus hysteria. As queer erotic practices have been the subject of structural oppression in modern western society, we sought to understand how the energy of erotic affect can be a source of resistance to forms of power which seek to extinguish it and also how erotic practices are shaped by the conditions of power under which they exist. To explore these possibilities, we imagined a world in which skin to skin contact is completely prohibited and, in reference to the condoms used to avoid HIV and the gloves used to avoid H1N1, latex barriers are required to be worn at all times. An initial gesture to create the scenario was to take a number of standard Center for Disease Control posters, which had become very prevalent after H1N1, and to modify them with our imagined future restrictions, including “failure to comply will result in a minimum of 10 years in a federal penitentiary”, pointing to the convergence of medicine with the Prison Industrial Complex. We then distributed these posters throughout San Diego in public spaces and also displayed them throughout the Museum of Contemporary Art, San Diego, where we performed an episode of *virus.circus*.

Through a series of erotic experiments, *virus.circus* explores erotic forms of expression that do not involve touch, or which minimize touch, creating a deterritorialized erotics that appears unfamiliar to the viewer and allows them to imagine new narratives of erotic embodiment and new possibilities of sexuality and gender. In *virus.circus.touch* the two performers first weave throughout the audience and then face each other from across the room. We then walk towards each other slowly, focusing on the erotics of expectation, focusing on trying to arouse each other with eye contact and the way that we are walking. For this performance, an infrared distance sensor was sewn into our costumes, which allowed us to move our Second Life avatars closer to each other as we walked, mirroring our physical distance. Our multiple simultaneous embodiment through our Second Life avatars is a transreal gesture that further deterritorializes our embodiment and adds dimensions of gender including transspecies, cyborg and mythological characteristics.

In *virus.circus.breath*, we focused on three types of breathing. The performance begins with rapid hysterical breathing as we attempt to bring the audience into the alternate reality by telling them, with great distress, “for your protection and the protection of others, please wear your mask” and “the virus must be contained”, and handing them a medical mask commonly used to avoid H1N1. At this point we often faced concerned audience members who demanded to know why they needed to put on their mask and at times left the performance. We then proceeded to erotic breath control, in which Cárdenas wore latex gloves and slowly restricted the amount of air that Mehrmand could breathe. For this segment, we used a hand made pressure sensor constructed from neoprene, conductive thread and conductive fabric that detected the amount of pressure applied to Mehrmand’s neck and changed the quality of the sound of our breathing, amplified with microphones inside of our masks

[6]

. The final part of the performance sees us lying on stage, below the projected image of our avatars having sex, doing tantric breathing to induce simultaneous energy orgasms. Here we are performing as two characters who are living within the restrictions of their society but still find ways of having erotic moments together. We imagine the fear of the rhetoric viruses as a trapping of logic that can be shaken off by the excess of orgasmic affect within the context of resistant practices creating their own new narratives of erotic encounter.

In *virus.circus.probe* we see the characters begin to resist the hegemony of western medicine and the narrative of fear of infection that is so central to it by developing their own Do-It-Yourself (DIY) Medicine and Femme Science. The authority of western medicine is coded into laws preventing acts such as practicing medicine without a license and which threaten years of imprisonment. Yet the amount of medical knowledge available to people is rapidly expanding both with the advent of websites such as Medpedia.org and with the widespread access to personal biometric technologies. The cyberfeminist collective Subrosa has pointed out in their book *Yes Yes* that “the rise of the University-educated male medical doctor” coincided with “the banishing of common (female and people’s) knowledge gained from centuries of inquiry, experimentation, and practice, represents one of the greatest losses to the medical and scientific world in Western history”.

[7]

In *virus.circus* we imagine two queer femmes who resist the system of knowledge known as Western Medicine, a system that their society uses to define their bodies and sexualities, by creating their own medicine.

Performing what we imagine to be Femme Science as proposed by Lisa Duggan and Kathleen McHugh

[8]

, in *virus.circus.probe* Mehrmand uses a metal instrument to test Cardenas' body, learning the contours and limits of her body, violating the hegemony of doctors as the only agents with power of knowledge of the body. Queer femme here is imagined as an affect created through embodied gestures that resist a claim that femininity is passive, and in contrast reflects an intentional construction of gender and forms of pleasure. Using conductive thread, we created a touch sensitive dress that responds to Mehrmand's various touches by changing the pitch of the bass sound emanating from the sound system. Wearing Polar Team 2 heart rate monitors allows us to display on a laptop the R-R interval values for our heart rate, a number representing the number of milliseconds between the R peak of our heart beats which can be analyzed to determine breath rate and which areas of the autonomous or parasympathetic nervous system are in use. Continuing on, Mehrmand tests Cardenas' limits by inserting the testing instrument into her anus. An accelerometer sewn into Mehrmand's glove detects the speed of each thrust, applying a proportional amount of vibration to her vagina with a strap on motor also wired to the glove. As the performance unfolds, the audience stands in a circle around the testing moment, recalling the medical amphitheater and implicating them as voyeurs in a shared intimate erotic moment of medical testing as foreplay and sex. As the scene unfolds, a graph of our heart rates is also drawn in Second Life, above our avatars looping in a sexual penetration animation.

Mixed and Alternate Reality

Wearable electronic garments allow the performers to experiment with transreal embodiment, extending their physical bodies sonically and virtually. *virus.circus* attempts to immerse the audience/participants in an alternate reality by creating a slippage of perception. Code switching between mixed and alternate reality, *virus.circus* asks how we can use reality as a medium, resonating across a number of modes including public space interventions, performances in museums and galleries, and networked performances to create augmented, alternate and mixed reality scenarios.

Conclusions

Across episodes including *virus.circus.touch*, *virus.circus.breath* and *virus.circus.probe*, New possibilities of embodied knowledge unfold through the sonification and visualization of biometric data including heart rate and R-R intervals, as well as data from an ultrasonic rangefinder bra, a pressure sensing choking collar, touch sensitive dress and a motion sensitive glove that controls a strap-on vibrator. We have developed open source hardware and software to facilitate new forms of erotic expression, deterritorializing our everyday erotic practices to make them nearly unrecognizable in order to facilitate imagining them as future narratives of resistance to the confluence of medicine and structural oppression.

Source Code

The following code is an excerpt from a patch for Second Life that reads from a local file and moves two objects in the virtual world of Second Life. We have used this code for numerous performances, including *virus.circus.touch* and drawing a heart rate graph in *virus.circus.probe*. We use Puredata as a bridge to read the data from the arduino and write that to a local file and then we use this code to read that file and move objects in Second Life. The patch applies to llappviewer.cpp in the Second Life 2.0 codebase. The complete patch can be found at <http://transreal.org>

```
// virus.circus patch

...

//set the UUID of the object to move

LLViewerObject *objectFound = gObjectList.findObject(LLUUID("38ee12bb-...-fa23e356e8a2"));

if (objectFound)

{

LLVector3 objectPos = objectFound->getPosition();

objectPos[2] = numFromPd;    //home z - 278.575;

objectFound->setPosition(objectPos);

LLViewerRegion* current_region = objectFound->getRegion();

if (current_region && (! gMessageSystem->isSendFull(NULL)))

{

    U32 update_type = UPD_POSITION | UPD_ROTATION | UPD_LINKED_SETS;

    U32 *type32 = (U32 *)&update_type;

    U8 type = (U8)*type32;

    U8 data[256];
```

```
S32 offset = 0;
```

```
gMessageSystem->newMessage("MultipleObjectUpdate");
```

```
gMessageSystem->nextBlockFast(_PREHASH_AgentData);
```

```
gMessageSystem->addUUIDFast(_PREHASH_AgentID, gAgent.getID());
```

```
gMessageSystem->addUUIDFast(_PREHASH_SessionID, gAgent.getSessionID());
```

```
gMessageSystem->nextBlockFast(_PREHASH_ObjectData);
```

```
gMessageSystem->addU32Fast(_PREHASH_ObjectLocalID, objectFound->getLocalID() );
```

```
gMessageSystem->addU8Fast(_PREHASH_Type, type );
```

```
htonmemcpy(&data[offset], &(objectFound->getPosition().mV), MVT_LLVector3, 12);
```

```
offset += 12;
```

```
LLQuaternion quat = objectFound->getRotation();
```

```
LLVector3 vec = quat.packToVector3();
```

```
htonmemcpy(&data[offset], &(vec.mV), MVT_LLQuaternion, 12);
```

```
offset += 12;
```

```
gMessageSystem->addBinaryDataFast(_PREHASH_Data, data, offset);
```

```
gMessageSystem->sendReliable(current_region->getHost());
```

```
}
```

```
objectFound->setPositionAgent(objectPos);
```

References and Notes:

1. <http://news.bbc.co.uk/2/hi/americas/8016909.stm>
2. <http://news.bbc.co.uk/2/hi/europe/8028169.stm>
3. <http://www.cnn.com/2009/HEALTH/06/11/swine.flu.who/>
4. <http://adminrecords.ucsd.edu/Notices/2009/2009-4-28-3.html>
5. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1470625/>
6. *The pressure sensor was constructed based on documentation from Mika Satomi and Hannah Perner-Wilson, <http://www.kobakant.at/DIY/?p=65>*
7. *Subrosa Collective, *Yes Species*, p. 53, <http://www.refugia.net/yes/yeschapters.html>*
8. *“A Fem(me)inist Manifesto”, Lisa Duggan and Kathleen McHugh, in *Brazen Femme*, edited by Chloe Brushwood Rose and Anna Camilleri*

(CON)FIGURATIONS OF EXILE

Silvana Carotenuto

The contribution that follows would like to be a synthesis of the (theoretical-practical) work carried out in the workshop devoted to “Exile Writing. Arts and Technologies of Women”. The bibliography used in the workshop (the references to the pieces of art, in the form of novels, photography and video-art, dance performances and internet blogs) can be traced back in the proposal we offered to the participants.

Here I would try to explain the theoretical premise that brought me to reflect on the relevance of the figure of the exiled; then, in a development of this premise closer to my expertise, within gender studies or *écriture féminine*, I will try to show the interconnection between exile and women’s invention and creativity – the necessity of re-writing (in a ‘enlarged’ notion of *écriture*, as a gesture that “can remain purely oral, vocal, and musical: rhythmic or prosodic”) [1] the pains and sufferings of displacement, dislocation and diaspora, meets the capacity of female artists in a singular and exemplary manner: they narrate, envision, experiment, communicate the experience of their own and their communities’ exile with an intense drive for intimacy, sharing, and survival; even more, their ‘yes’ to life takes the shape of a consistent innovation, of the technologies peculiar to their arts, producing renovation and transformation, linkage, fragmentation, and recombination of the languages of *teckné*.

Hospitality

‘Banished’? O friar, the damned use that word in hell
(William Shakespeare, *Romeo and Juliet*)

“Any person who (...), owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable, or owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it.”
(Convention Relating to the Status of Refugees”, Geneva, July 28th, 1951)

A figuration is a living map, a report in continuous transformation of the self; it is not a metaphor. Being nomads, homeless, in exile, refugees, victims of war rapes in Bosnia, migrants without fixed home, clandestine migrants, it is not a metaphor...it is history tattooed on one’s own body. [2]

Exile – the whole question of ‘hospitality’ resounds here: how to welcome the one who arrives unexpectedly, the one who flies away from the origin because of violence, expulsion, under the threat of death? What is so singular about the ‘figure’ of the exiled as to make it crucial for our thinking on hospitality? Hospitality should be absolute [3] – why does it connect to the singular figure of the exiled? Because, maybe it is the figure of the political par excellence, [4] maybe because s/he shares something common to human destiny – displacement, dislocation, diaspora, escape from the origin, insistent nomadism, loss and endurance. Julia Kristeva would say “we are all strangers to ourselves” [5] – the exiled

being experiences such strangeness even more, more vividly, under the strongest pressure – we might use the expression ‘on the skin’, if it did not keep its impression on the surface...

Women and the Arts

Much of the exile’s life is taken up with compensating for disorienting loss by creating a new world to rule. It is not surprising that so many exiles seems to be novelist, chess player, political activists, and intellectuals...

(Edward Said, “Reflections on exile”)

Skin/body – it is women who reach the highest percentage in the contemporary fluxes of exile. Among refugees, expatriates and the exiled, women undergo the imposed trajectories as the men away from their communities, in a double exposure – of race and gender. It would make a whole spectrum of difference; would not the hospitality due to the exiled woman be different? Would she ask for different acts of welcoming? ‘Who’ would welcome ‘whom’? Today, are not the women on the planet questioning the places of their confinement (the home, *oikos*), of belonging (women’s infinite practices of singularity) of residing – globalization, cosmopolitanism, crossing, fluidity? Women share the exile—from themselves; their ‘double’ exile – from themselves and from their mother tongue. They share it because they urge the work of hospitality – to their alterity, difference, hybridity, ‘monstrosity’, and constant metamorphosis. [6] To their ‘writing’ – it means here: their ‘arts and ‘technologies’. It can be a story, an image, a movement, dance, or internet writing; the diary, the novel, the short story; photography, video-art, digitality, blogs – there is an immense production of female oeuvre inspired by (the experience of) exile, devoted to the (impossible) testimony of its experiences, of its impossible trajectories – would this commonly mean ‘being thrown into the world’? Would this ‘common’ mean an abstract overcoming of the difference between privileged cosmopolitan women in the western world, and their sisters expelled and scattered throughout the world? No, it is, rather, difference itself – in the signs of writing, in the frames of photography, on the screens of the installations, recorded by a digital camera or shared on the screens of computers, women are ‘different’ from themselves and from the others, only commonly incapable of ‘staying’ within the boundaries, the pages, the frames, languages, limits; and thus, necessarily – it is their strategies of survival – capable of crossing (lines of lands/lands of lines), of trespassing (geographically, culturally, linguistically, technologically), of overflowing (history, disciplines, lives), finally able to celebrate – their own hybridity, monstrosity, metamorphosis...

Paths of Exile

The film *Transit* by Bani Koushnusdi (2004) follows a group of young exiled men throughout Italy, in their escape to Paris. In France, there is a small room waiting for them – where they will wait for a pass to England. In the room, it is impossible to sleep or sing; still, on a mattress, there is a silent girl – why does she never speak? Where does she go at night, taken out by the guardian? One of the guys, left alone with her, starts asking – over the gift of an orange, with a strange music coming from the radio, the story she tells is a story of separation, literal loss, extreme and lonely survival: the girl was escaping from persecution with her sister and family; at one point, they had to cross a river – the girl crossed the water; her sister, the husband and their children were left behind! She never saw them again; this was months ago – now she despairs over their destiny. The screen remains dark, the voices are low; on the screen, however, the story writes the beginning of a friendship – maybe the girl and the boy will make it together to London ...

This intense, dark and sad, wonderful and painful, film gives us the image of a specific diaspora: from Afghanistan to Europe. What about the journey away from the origin framed when it is framed by the photographer Emily Jacir, in her “Where we come from” (2003) or in “Memorial to 418 Palestinians villages that were destroyed depopulated and occupied by Israel in 1948”, to tell us of the exile par excellence – so cruelly inscribed on Palestinians after the originary diaspora of the scattered Jewish people? What about the Algerian exile, if it is the wonderful work by Zineb Sedira to narrate the destiny of the ‘mother tongue’ for the generations-to-come: the artist’s mother can speak only in Arabic, after years of permanence in France; the French – as a legacy of colonialism – spoken by her daughter; the English of her granddaughter? No origin, no sovereignty of one language [7] – exile is experienced in the multitude of languages – and if there is no communication through words, there will be love and affection through the eyes, the touch, the bond that dissipates beyond all claims to a commonality of origin. And what about “hai mish eishi” (“this is not life”, 2001), a video by Alia Arasoughly who gives space to the women’s everyday life contrasted with the television news from the Palestinian territories, or the docu-fiction “Who gives kisses from her lips” (2004) by Farkhondeh Simin, dealing with a different tradition of ‘marriage’ – it was once up to the women to choose their husbands – in Iran... (you can watch how some young women in Naples, Italy, rewrote their own paths through exile on <http://www.youtube.com/watch?v=stteSX7w1ys>)

Exile-Writing

Obscure arrivals, transits and escapes – across the land of Afghanistan to Europe, between colonies and post-colonies; to give sense to the terrible conflict in Palestine; providing the details of the everyday life of women in an impossible confined life; perhaps, to let the memory of a different power of women emergence on the plane of visibility ... There are so many examples we could never be accurate here – still we could ask a different question: what would happen if we thought of exile as a territory for collaboration? If we thought of exiled women as agents of a common sharing? As the chance of the invention of new ‘bonds’, new collaborations, other forms of commonality, sensibility, and imagination? This could provide a line of attention across geographical boundaries, among female creations, in-between the female ‘I’ and the ‘eyes’ of women – in-between their arts and their technologies. In this case, we could gather the photographs of Newsha Tawakolian (www.neshatavakolian.com) together with the incredible images by Shirin Neshat in the series “Women of Allah”; we could compare, in their difference still re-sounding of the same chant, the video-art of Shirin Neshat in “Turbulent” (1998) and the retelling of Kenji Miyazawa’s *Milky Way Railroad* in “Night Passage” by Trinh T. Minh-ha (2004); [8] we could read the collaboration across the Partition of India and Pakistan between the novel *Cracking India* by Bapsi Sidhwa and its filmic re-elaboration in “Earth” by Deepa Mehta; we could read the extraordinary common work of the writer Sharmuch Parsipur and the director Shrin Neshat around the fairy tale and the film *Women without Men*; finally, we could enjoy the aesthetic collaboration of the choreographer Isabella Rocamora with some exiled women within their shared “Horizon of Exile”(2007); we could finally reflect on what is happening in North Africa now, with the revolutions in progress, thanks to the digital tales told by the blogs of the young women who want to inform, communicate, create dialogue and the con-division of history across a whole population of migrants, expatriates, and refugees...

The Castle of Crossed Destinies (Italo Calvino)

After two thousands years of world history dominated by the sacredness of the Baby Jesus, might women be in a position to give a different coloration to the ultimate sacred, the miracle of human life: not life for itself, but life bearing meaning, for the formulation of which women are called upon to offer

their desire and their works.
(J. Kristeva, *The Feminine and the Sacred*)

This would only be 'one' line of work, the material for gathering women together and discuss, watch, think of exile, of its pains, together with their inventions. There would still be stories to tell – you can hear, watch and reflect on some of them, on their infinite paths of written and visual re-articulations their crossings of invention and creation, on the website 'Exile Writing' (http://www.melissaramos.com.au/exile_writing/index.html) – a palimpsest electronic space of the experiences of the women gathering in the Istanbul workshop, re-narrating, recreating, rewriting their sense of displacement in the city, on the page, on the screens, in the frames, according to their own 'thrown of chance'.

The crossing of reality and functionality, of creation and technological invention centres the figure of the female exiled as the locus of a necessary and urgent theoretical reflection, focusing on her artistic production as a crucial nexus of contemporary imagination – 'Exile Writing' can be taken as the collective proof of this thesis, through the narrative, visual, multimedia narration of our common displacement in Istanbul. Here I offer my own line of thought, one kind of path of reading its extreme potentiality – as if I were a character in Italo Calvino's *The Castle of Crossed Destinies*, it is my way of making sense of the cards of our common story...

Once upon a time, the inhabitants of the city of Babel had no need of translation. There and then women – marine creatures searching, veiled or unveiled, the depth of the underworld – were fluid, unconfined within any barrier of language; their space was the sea, water, the fluxes and the movements of waves. Then came (the lost) translation, the confusion of languages, the speaking in tongue – it was the vertigo from which Zoë was born, the Byzantine Empress who died in 1050, now, as a child, cradled by the curve of the world. Exposed to displacement and violence, her first question was: "How can we find peace?" Music, more music!! Indeed, her birth, her emergence from water and silence, was soon exposed to the craziness of the world – frames, inside/inside, the minaret, the prayers, men fishing, men doing their abduction – rigid shapes raising to the sky, hierarchy, conflicts, wars – was she alone in this world? It seems she is surrounded by loneliness; still there is music, a local violin playing, and a 'throne' waiting for her, a small and lonely barge (would she not resemble the Queen of Egypt, Cleopatra?) waiting to take her on. It signs the moment of her 'aporetic' responsibility: she is in the middle of movement and stillness – where could she rest in such madness? Could she dance at the beat of the violin? Can she survive? In order to return to her underwater world, she urges for passionate stories that countersign her destiny – she looks for stars ("female, enlightened celestial bodies, material or immaterial, durable or ephemeral") and for the images taken for 'wander': man and woman separated; the sea and the sky, covering her soul, a veil to hide her tears – 'writing' would be her inventing way back home, once again... Around the mermaid, there is light and magic; death can be overcome by strength, destruction can be won by rebellion. Is she looking for justice in the world? Justice would rise onto the horizon as a sign of the future, l'à-venir, messianism without messiah. Placed in-between the Devil and the Papess, blissed by the banishment of the Pharmakon, writing would come to her/to us, from the water onto the surface – it would inscribe women's gathering around the goddess of Justice; it would feel other women's art and creativity, their thankful hands of invention – it would write their nightmares and dreams in spider webs, textiles, weaving and texting the cruelty of the world and, together, its militant witnessing: occupations of spaces of culture, birthing, improvements of common justice – fights/pride, battles! It would then follow the dance of the silhouette of chance, the choreography of women; it would perform the life of Zoë: life. [9] Would it be Theodora and her dog: a duo, two playmates who are "bound, bowing, wounded, found, hung, fallen, lumping, leading, turning" towards the invention of a new world, through the reappearance of music, the music of birds – with birds, there would be more poetry, more women, and more

courage...! [10] *The ladder of writing is only indicating another 'passage', another transit, a different path, a sense of community, communality and communion for the exile of women – from themselves and from their mother tongues...*

...we find: less and less poetry/less and less angels/less and less birds/less and less women/less and less courage. Jacob wakes up, he gets up. What becomes of the ladder? You have to take a rock, put it under your head, and let the dream ladder grow. It grows down – toward the depths. [11]

References and Notes:

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3. Jacques Derrida, *Cosmopolitanism* (the opening speech for the celebration of the first congress of the refugee-cities in Europe 1996, an initiative of the Parliament of the Writers to grant hospitality to the writing of exiled artists), and also *Of Hospitality* (Stanford: Stanford U.P, 2000).
4. Giorgio Agamben, "Politico dell'esilio," <http://isole.ecn.org/filiarmonici/agamben1998.html> (accessed September 2011).
5. Julie Kristeva, *Strangers to Ourselves* (New York: Columbia U.P., 1991).
6. For the female 'monstrosity' in relation to the 'panic debate' on the veil in France, I refer to F. Benslama, "Le voile de l'Islam", *Contretemps*, 2 (1997).
7. *Fichu*, (Paris: Galilée), 2002 by Jacques Derrida; in Italian, the first publication of the essay was bearing the title "La lingua dello straniero."
8. Trin T. Minh-ha, "Reading Miyazawa Kenji and Making 'Night Passage'," *Anglistica*, 11, 1/2, 2007.
9. This is the 'task' of crossing zoo (biological life) and bios (the life to be told, capable of being written), accorded to the women of new century comes from C. Clément and J. Kristeva, *The Feminine and the Sacred* (New York: Columbia U.P., 2001) 14.
10. Helene Cixous, *Three Steps on the Ladder of Writing* (New York: Columbia U.P.,1993), 108.
11. *Ibidem*.

PROCEDURAL TAXONOMY: AN ANALYTICAL MODEL FOR ARTIFICIAL AESTHETICS

Miguel Carvalhais

This paper proposes an analytical model for computational aesthetic artifacts based on Espen Aarseth's work. It reflects procedural affinities that may not be found when focusing on surface structures and aesthetic analyses developed from them. The model attests to the importance of computational characteristics and of procedurality, both as conceptual groundings and as aesthetic focuses, as aesthetics pleasures in themselves.



Figures 1 and 2: Plot of the first two synthetic axes of the MCA, showing only the systems (top) and the categories (bottom).

Introduction

The growing presence of computational media and tools in many areas of contemporary life brings massive change to all who interface with these systems, either as consumers or producers, as spectators or interactors, as writers, readers or *wreaders*.

‘Artificial *poïesis*,’ the production of computational aesthetic artifacts, is widespread. Computational aesthetic artifacts are created by practitioners with diverse backgrounds, methodologies and terminologies that are not always reconcilable and that create obstacles to mutual understanding, effective cooperation and criticism. However, in spite of contextual variations inherent to each particular field or project, and regardless of the specific functions, contexts or settings of production, there are many commonalities to be found among these works. Various phenomena discovered with or through these media are genuinely new and unprecedented, lacking clear references in other arts or fields of study, as well as a clear nomenclature, a disadvantage for their practice and study.

This work hopes to contribute to the development of a terminology for computational media, by proposing a framework for their study and criticism that is versatile and plastic enough to accompany their ongoing transformation and its effects in creative practices.

Motivation

The starting point for this work was Espen Aarseth’s model for the analysis of cybertexts. [4] Although tailored to textual artifacts, this model presents several advantages: 1) it is focused on the structural, functional and procedural traits of the texts, rather than on their surface features or contents; 2) it is extensive enough to encompass different media and expressions; 3) it emphasizes common features found across most of the artifacts, rather than aspects that may be specific to some; 4) it acknowledges the interactive potential of the artifacts, without establishing a precedence over other important characteristics for the production of meaning and the development of the aesthetic experience; and finally, 5) it is workable, with a set of seven variables and eighteen possible values that create a space of 576 unique media positions.

By applying Aarseth’s analytical model to a broader range of aesthetic artifacts, we asserted its efficacy and were then able to adapt and expand it, in search of a more comprehensive description of the works. The variables were tested for suitability and with the exception of one, all proved to be usable in the new model.

The model

DYNAMICS

The first variable in Aarseth’s typology describes the contrasting behavior of signs *instatic* systems – where they are constant – and in dynamic systems, where we repurposed the original values to describe *surface unit dynamics* (SUD) and *deep unit dynamics* (DUD), following a nomenclature inspired by

Krome Barratt. [5] SUD describes rearrangements of perceivable structures without the transformation of their foundations which is described by DUD.

DETERMINABILITY

Determinability concerns the stability of what Aarseth defines as the “traversal function” [4] of the artifact. This is the set of conventions and mechanisms that combine and project surface and deep units to the user. [3] If multiple experiences of the same artifact may result in similar behaviors or even in exact repetitions, we classify it as *determinable*. If on the contrary the artifact may lead the traversal function as much as, or even more than the users themselves, driving the experience into unknown territories and forcing users to adapt or react to new usage scenarios, we classify it as *indeterminable*.

TRANSIENCY

Transiency describes the temporal existence of the artifact. If the mere passing of time causes changes in the artifact’s outputs then it is *transient*, otherwise it is *intransient*.

ACCESS

Access describes whether the totality of the artifact or its outputs are available to the user at all time, in which case the access is *random*, otherwise being *controlled*.

LINKING

Linking describes the existence of rules or devices that may lead the user through the traversal and whether the access to these is *explicit* or *conditional*.

USER FUNCTIONS

The last variable in Aarseth’s typology describes which functions are available to the user besides the omnipresent *interpretative* function. In the *explorative* function, the user chooses which paths to follow along the traversal while in the *configurative* function new structures, i.e. surface or deep units, may be rearranged or created. These two functions are what “in addition to the obligatory interpretative function” [4] define an ergodic medium.

MODALITIES

Modalities will quantify the levels of perception involved in the user functions. They are defined sensorially [8] – *visual*, *audial*, *haptic* – and expanded with the perceptions of *motion* and *procedurality* – that of mathematics and of logical structures [11] – raising their total number to five.

AUTONOMY

Autonomy is a descriptor of the system's capacity to generate novelty – or to be somewhat creative – without resorting to external inputs. *Autonomous* systems either contain or generate all the data they need to produce novel outputs, while systems fed by external sources – or that include extensive sets of hard-coded data, digital data structures or digital streams, according to Berry [2] – are classified as being *data-driven*.

CLASS

This variable details the computational class – understood after Stephen Wolfram's definition [12] and Rudy Rucker's interpretation [10] – that better describes the outputs of a system. Static intransient outputs were classified as class 1, most of the static transient outputs as class 2, and those that exhibit complex behaviors as either classes 3 or 4, using the structure of the outputs to determine whether the system was class 3 (random, totally unpredictable) or class 4 (structured, at least locally, and at least partially predictable).

VARIABLES AND POSSIBLE VALUES

1. Dynamics: static, SUD, DUD;
2. Determinability: determinable, indeterminable;
3. Transiency: transient, intransient;
4. Access: random, controlled;
5. Linking: none, conditional, explicit;
6. User functions: interpretative, explorative, configurative;
7. Modalities: 1-5;
8. Autonomy: autonomous, data-driven;
9. Class: 1-4.

Data collected

We compiled a set of representative samples, collecting diverse approaches to procedural creation and focusing on visual arts and design. Besides a set of pieces of our own choosing, we collected an independent selection of works, trying to avoid a bias towards the model under development. The complete list of 54 works and the details of their analysis are too extensive to present in this article, but can be found in our previous works. [6] [7]

Analysis

After classifying the works according to the model, and still following Aarseth's methodology, we used the R environment for statistical computing and the CA package [9] to develop a Multiple Correspondence Analysis (MCA). The first synthetic variable achieved 54.1% inertia, but a plotting as a one-dimensional graph revealed the lack of indispensable information that was added by the extra 8.6% of data variation provided by the second synthetic variable. We therefore, opted for plotting the MCA as a two-dimensional graph describing 62.7% of the data variation.

Control Analysis

This model was developed with the purpose of allowing objective classifications and of minimizing subjective factors. Trying to test the definitions of the variables and our own analysis, we developed a control analysis, providing the list of systems and a description of the model to an independent analyzer.

The understanding of most of the variables was straightforward. The greatest challenge was found with modalities variable, especially with the classification of the procedural and haptic modalities. The control analysis tended to classify as haptic all those systems that allowed any degree of interaction, regardless of which devices were used in the process. Our analysis used different criteria: standard controllers (e.g. mice or keyboards) used in established ways (e.g. as in operating systems or productivity tools) were not classified as haptic; only works that used dedicated controllers or that employed standard controllers in non-conventional ways were considered to heighten haptic awareness and involvement. The control analysis also found the procedural modality in more instances, something that may be due to regarding the outputs of a work as being part of its system and not as independent artifacts, that may or may not be procedural or able to communicate procedurality. The procedural modality is tied to the perception, understanding or intuition of mathematics and logical structures. It is only when the outputs of a system present a minimum of clues for that understanding that this modality can be identified. In some cases this classification can be somewhat subjective, because it is historical, it deals with acquired knowledge and learning.

The control analysis revealed a divergence of 7.4% – 36 contrasting classifications in a total of 486. The divergence in the classification of modalities is not a sign of arbitrariness, but the effect of the false positives created by different understandings of the variables described above. We found that in a majority of cases, the divergence was explained by the extra classification of procedural (eight) or haptic (twelve) modalities in a work. Should we choose to disregard this effect, we could interpret the divergence in modalities as a much lower 5.5%, lowering the total divergence to 3.29%.

DIVERGENCES IN THE CONTROL ANALYSIS

1. Dynamics: 3 divergences, 5.55%;
2. Determinability: 0 divergences;
3. Transiency: 0 divergences;
4. Access: 0 divergences;
5. User Functions: 1 divergence, 1.85%;
6. Linking: 2 divergences, 3.7%;
7. Modalities: 23 divergences, 42.59%;
8. Autonomy: 0 divergences;
9. Class: 7 divergences, 12.96%.

Findings

Studying the plot of the MCA, we find that the periphery is taken by works that originally stood somewhat apart from the rest of the selection due to their contrasting physical characteristics. These are Christa Sommerer and Laurent Mignonneau's *A-Volve* (#4), Carvalhais, Tudela and Lia's *30x1* (#27) and

Andreas Muxel's *Connect* (#40). The work that is most isolated is Olia Lialina's *My Boyfriend Came Back From the War*(#6), which is also the only narrative hypertext, plotted logically and consistently.

In the east edge of the plot, we find a series of printed or otherwise static outputs, such as Roman Verostko's *Seven Sisters: The Pleiades* (#9) or Andy Huntington and Drew Allan's *Cylinder* (#16). The west area, in contrast, is predominantly populated by interactive systems. By circumscribing both areas, we find that there is no overlap and that two well-defined islands are created in the graph.

A closer look at the categories encompassed by the areas allows us to understand which values are more typically associated with them. In the eastern quadrant, we discover works that are mostly static, determinable, intransient, randomly accessible and with no linking. Deep unit dynamics, conditional linking and the explorative and configurative user functions characterize the interactive systems that also tend to concentrate more modalities and to develop higher computational classes.

The single book among the pieces, Raymond Queneau's *Cent Mille Millions de Poèmes*(#1), is found in the middle of the non-interactive island, a placement that raises the question of whether books can ever be understood as interactive devices. Following Schubiger's definition [1] of interactive systems as supporting communication from user to the system and back, or Lippman's definition of interaction as a "mutual and simultaneous activity," [4] it becomes clear that regardless of any manual reconfigurations that may be developed, a printed book should never be classified as interactive. Although the configurative user function is involved, it does not follow that a cybernetic feedback loop can be established because the system is not able to act on its own. If we circumscribe the systems that produce computer-based outputs or real-time computations, we also find a clear division between two sets.

It is not possible to infer much about an eventual genre partitioning. We wondered whether this could be a shortcoming of the model or if traditional genres may be unsuitable to the description of computational media. If we study pieces plotted in coincident coordinates, we discover that traditional descriptions such as sculpture, painting or drawing, do not prove to be very useful. We can find two of the works most easily identifiable as sculptural – *Cylinder* (#16) and Andreas Nicolas Fischer's *A Week in the Life*(#39) – plotted very closely but still in different coordinates, sharing positions with systems that produce visual-only bidimensional outputs. We find linear videos plotted in neighboring positions, but still not necessarily in the same coordinates, something far more common among systems that produce printed outputs. It is also interesting to discover that two of the pieces where a strong directionality (and irreversibility) of time is patent – William Gibson's *Agrippa (a book of the dead)* (#3) and John F. Simon Jr.'s *Every Icon* (#7) – are plotted in the same position. Although, in an initial analysis, they may seem to be very different systems, belonging to different genres or artistic typologies, they share strong procedural traits, turning out to be much more similar than one would originally expect.

The coherent distribution of the classified artifacts that is found in the plot of the MCA contributes to a validation of the current state of the model. The analysis of clustering may eventually lead to the discovery of new genre descriptors.

Future research

This work studied systems that could broadly be classified as visual arts or communication design. Aarseth's previous analysis, from which some works were preserved, focused on pieces that could generally be classified as literary. In the future we expect to broaden our field of analysis, by increasing the

quantity and variety of works. The common characteristics discovered in this set of works lead us to believe that such a follow-up study needs to be developed, allowing us to refine the model and to further develop the study of the procedural and haptic modalities as better definitions of both are undoubtedly necessary.

A complementary path to follow is the approach to the 'perspective' variable from Aarseth's model, that focused on the text requiring the user to play a strategic role as a character in its diegesis, and that we did not succeed to integrate in the presented model. Artificial aesthetic systems are created from processes, and narrative aspects may be generated from procedurality and the procedural modality, from the user's desire to witness the unfolding of processes and from the simulations and predictions that are inevitably created. A complete study of procedural media must include their narrative properties without losing sight of the remaining procedural aspects so far surveyed. Although a partition between the study of rule-based and story-based aspects of systems is certainly possible, we search for a dialectic model, where one is able to reintegrate perspective and understand how narrative emerges from rules.

Acknowledgements

This work was only possible due to the help, advice and insight provided by Heitor Alvelos and Penousal Machado, supervisors of the dissertation in which context it was developed. [7] We are also indebted to Golan Levin, Lia, Luísa Ribas, Marius Watz and Florian Cramer, for invaluable advice and collaboration. This work was developed with the financial aid of the Fundação para a Ciência e Tecnologia (FCT), under the Programa Operacional Potencial Humano (SFRH / BD / 43877 / 2008).

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THE EPHEMERAL IN AUDIOVISUAL REALTIME PRACTICES: AN ANALYSIS INTO THE POSSIBILITIES FOR ITS DOCUMENTATION

Ana Carvalho

Realtime audiovisual performance is an art-moment defined as a unique narrative. By establishing a theoretical structure, grounded on a permanent process of becoming, the subject of documentation will come to the surface. The text aims at presenting references and considerations for the study of documentation of the ephemeral project towards the collective construction of practice's memory.



Systematic Illusion, 2010, Ana Carvalho, Video performance.

Situated between the moment and its memory, a document is evidence of an action. Ephemerality is a key feature of contemporary artistic practices happening at the point of convergence of digital technology and mobile communications through interdisciplinary discourses. The performative moment has a unique narrative that occurs in the present, which is no longer past, neither is future yet. The moment combines all that has preceded and re-arranges elements to constitute possible futures.

The interdisciplinary nature of realtime audiovisual performative practices permits related reflective thinking and theoretical discourse to be diffused and, therefore, associated and located within other disciplines. [1] For this reason, a discourse that is particular to audiovisual performance as a specific field of research is minute. In order to create the necessary theoretical arena to deal with the specificities of the practices in contemporary terms, descriptive documents are necessary to be identified.

In the generic landscape of digital ephemeral practices, the few projects related to documentation usually take empirical approaches, mainly aiming at the recovery and archiving of the past. Current reflection on the possibilities for documentation attempt to deal with the conflict between the temporal, immaterial and interactive essence of work developed within contemporary technological landscape by redefining the fixity that defines a document (with specific features, capable of constituting evidence for preservation). Within realtime audiovisual performance, this same conflict takes specific features as it deals with process, improvisation and identity, and has a unique potential through conversion of the tools of practice into the tools for crafting documentation.

This paper presents a set of references from where to think documentation towards its further empirical application.

Although specific within digital ephemeral practices, realtime audiovisual performance has under its umbrella several expressions differentiated by processes (more or less multidisciplinary, such as VJ/DJing), by context (in closer association with cinema: Live Cinema), by history (establishing a connection with musical composition: Visual Music). Moving away from nuances, differences and divergences, we define realtime audiovisual performance within the combination of two dialogical components: audio and moving image, in a unique, multisensory experience, centered around an audience. We establish a specific interest in the developments made by collectives, with emphasis on process.

We at first established a theoretical structure, through relationships rather than hierarchies, from where to look at realtime audiovisual performance. At its basis, in order for the relationship between process and event to be established, having in mind we are studying a time-based art form, the practice is divided into three moments: creative process, performative moment and community gathering moment.

We propose the performative moment, in itself the art expression, as a stable state within an interconnection of processes that encompass not only its own development but also the performer's body of work, as well as the practice itself as a whole (in its historical and contemporary dimensions). In this interconnection of processes, the time that directly precedes the occurrence of a performative moment will be its process of becoming, what we called the creative process, in terms of Gilbert Simondon's process of individuation . [2] Because there is no process of individuation without the individual, there is no creative process without performative moment. This process occurs in a chronological order. The first event of this order is the principle of individuation itself and the second are it in practice, in a process that results in individuation. At the third and final event is located the individual. Simondon's individuation is "primordial, for it is this process that at once brings the individual into being and determines all the distinguishing characteristics of its development, organization and modalities." [3] By looking at the relationship between the elements (technology, methodologies, knowledge, and other) that constitute the creative process, we establish connections with Simondon's system of historical-cultural evolutionary complexity between humans and technology where man has the role of organizer and interpreter of the ensemble of open machines as expressed in *On the Mode of Existence of Technical Objects*. The audiovisual technical set-up, which allows artists to play live, is an ensemble or a technical object of genetic complexity that establishes a relationship between artist and technology in two ways. Firstly through the capacity to change and make specific, sometimes unique, technical set-ups from a combination of elements. Whether proprietary or customized, mutable technical setups for live performance are developed having in mind a specific performer or performance. Secondly, through the improvisational nature in the relationship between artist and technology, as expressed in a poetical way by Mark Amerika in the description of the persona of the VJ. [4] It is from the point of the performative moment that we propose a look at its process and therefore, to look at the documentation.

To document the process of individuation is to make visible concepts and plans that enable the performative moment with its uniqueness. We propose a look into Process Art to understand ways to deal with documentation of the process as well as to documentation and presentation of Software Art. Possibilities for documents may take the form of technical drawing, scores and registration of dialogues between artists. These will provide ways to describe and understand the performance during its process and its connections with technological developments.

The creative process is what makes each performance unique, even when the elements that constitute it are the same. Returning to Simondon, the process of individuation does not end with the pre individual but continues within a metastable regime, born and maintained by the individual who carries its inheritance of the pre individual environment. The same way, the performative moment will give way to another process and another performance. Following this line of comparison, the preindividual is a source for other metastable states to occur and other individuations to take place. This results in a complex affection between performer, performance and practice as a whole. The process of individuation is here considered being part of an ontogenic process of a larger entity.

The performative moment is constituted by connections between the artists and the projected image, diffused sound, between artists and between artists and audience. If audio and video outcomes and photographic evidence of the environment, resulting from the performance, constitute the most common form of documentation, other aspects are less likely to be looked at. We propose two other elements to be considered of relevance when documenting the performative moment: experience and fruition. Experience is resultant from the relationship established between the performer and work and dialogue with other performers. Fruition is the relationship established by the audience with the work, with each other and the performers. A look into methodos Fluxus artists recurred to in the documentation of their actions, acts, happening and performances, will provide indications of the impact on the ephemeral work that documented descriptions of the audience may have. As an example from the contemporary audiovisual context, the festival Cimatics in its 2007 edition, had a team dedicated to collecting experiences from both spectators and artists. From the edited footage videos were made available online. These videos provide glimpses into the performances and an insight into firsthand experience.

Performance is the moment from where to look into the future. The third moment is the community gathering moment that occurs in physical spaces. Community is a nucleus of those who actively participate in the creation, in critical and theoretical reflection, and experience and fruition of the audiovisual performance. It is composed by individuals from diverse locations and cultural backgrounds. As expressed by Manuel Castells, gatherings allow the community to strengthen the bonds by connecting individuals that come together in a physical location. As nodes of the community, collaborative projects are points of intersection which envisage the network of connections. Collaboration can be identified as the joint effort of two or more people in a dialogical process, grounded on experimenting with concepts, data and technology. To document the community gathering moment is, therefore, of major relevance to understand the practice as a whole as it encompasses all the previously mentioned moments as well as the new one, which is each community gathering moment.

The concept of what is a document has changed, compelled by the shift from art-object to art-moment. Contemporary documentation, moving away from a formula to preserve and exhibit, has a dynamic meaning, which describes a tool to reinstall an installation, or to re-enact a performance. Performances, as well as ephemeral installations, exist only within the context they are presented into the public. In storage (warehouse or database) they are mere materiality. Defined by its uniqueness, the moment is an artistic, ephemeral manifestation that documentation should not replace. From the thirty three case

studies that constitute the research project *Inside Installations* (www.insideinstallations.org) one is relevant to highlight as example. A series of performances with liquid crystals that took place between 1965–66, by the artist Gustav Metzger, were exhibited at the Tate in 2005. For its original format, a team was necessary to manage material and 12 projectors. For the exhibition, the artist, together with the museum's technical team, developed an installation version based on the original concept. A remix of the material was presented recurring to recent technologies. The installation exhibited is also documentation of the performance. The replacement of the realtime and the performative by an object creates a situation that is worth analysing. We take a different and more challenging path with a proposal to approach documentation in a way that not only makes possible to preserve the practice's features but reinforce them.

Which criteria should describe this documentation?

Radical actions, throughout avant-garde movements of the past century, gave way to possibilities of new concepts of making and experiencing art. It is within a conceptual frame that Fluxus can be understood as a community and as a philosophy rather than simply a historical movement [5]. It is through an interest in publication of documents that a concept emerged, but it was through a performance festival that Fluxus started as a network. The emphasis on the playful and ephemeral is visible in published objects related to Fluxus (*Flux Boxes*), but the opposite can be said about the performances, if we refer to their printed scores (*Fluxus Cookbook*). This affection of ephemeral on object and vice-versa is also true for individual artists. Allan Kaprow's writings referenced directly to his work. In fact, they constitute the part that is left of most of his work. Kaprow wrote scores, collected written recollections of himself and of members of the audience of his performances and published about his work under a pseudonym [6]. The intermedia, performative and participatory character of Fluxus took many shapes, for example in events, publications and films. It is the relationship between ephemeral and document in the work of the community as well as of the individuals, that is relevant. Fluxus is a great inspiration for looking at the possible shapes documentation can take in relationship to realtime audiovisual performance from the point of view of the practitioner, from the collective and from the community.

Without defining documenting as a set of rules, but drawing a trajectory for the possibilities of documenting as complementary to practice, an example can be presented. Being interested in the creative process, the collective Aether9 (<http://aether9.org>) explores the possibilities of realtime manipulation and transmission of audio and video. Geographically located in different points of the globe, the collective's members maintain communication and perform exclusively via the Internet. Documentation of their Skype meetings that happen during preparation and during the performance took the shape of (so far) two books published by Greyscale Press (<http://greyscalepress.com>). These books can be purchased through online print-on-demand Lulu (<http://www.lulu.com>). This way, the readers can be located in any place of the globe with Internet and postal access. Through this process of documentation, Aether9 provides non-descriptive layers of the performances which help understand them beyond their results, based on the interaction between artists during the process of development and final presentation.

This example contrast with another one provided by the DVD *Immersive Works* by Granular Synthesis. The DVD presents recordings of performances between 1991 and 2001. A distinctive feature of this work, when compared with general attempts to document audiovisual events, is its descriptive nature (as opposition to the promotional short version very common especially in social networks). It is for this feature that we consider as an example of a document that provide evidence of the group's work. While Aether9's books detach the reader from the actual outcomes and presents creative process and

performative moment as an ongoing process, in the DVD by Granular Synthesis the focus is on the audiovisual experience of the performative moment. Both examples use individual, objectified documents, and none of them can be perceived as replacement of the performative moment.

To establish a theoretic structure, process oriented, from where to construct instruments to analyse and reflect on the contemporary audiovisual performative practice, is a proposal that comprehend both its ephemeral and multidisciplinary nature. Parallel to the institutionalized procedures, documentation of the contemporary practice is a subject of the community's concern. From within, documentation can be considered as registration of a series of relationships and interconnected processes that constitute means to retain and re-experience (individually and collective) the art-moment. This registration can be developed recurring to tools, technologies and knowledge from within the practice. The documents, developed by the community, are a primary source for further study, research and memory construction. In sum, to document is also to contribute actively to the construction of identity and context. In the future, this focus on the community and the possibilities of its actions will likely provoke changes not only in the practice itself but also in the way it is perceived externally.

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NETWORKED PROXIMITIES

Margarida Carvalho

This paper undertakes a critical reflection on experiments with audience participation in artistic practices involving networked performance and cyberformance. The performativity of webcamming and, in a more general sense, the presentation of the self and participation in digital networks are considered in the context of the current intensification of self-surveillance and participatory surveillance on social networks.

In 1972, Robert Whitman, one of the founders of the famous artists and engineers' collective Experiments in Art and Technology (E.A.T) of the 1960s, conceived the performance *News*. Broadcast live from the New York radio station WBAI, *News* can now be considered as a forerunner not only of the participatory culture of digital media but also, more specifically, of contemporary artistic experimentation in the field of networked performance. In *News*, the participants were sent to particular pay phones in Manhattan and asked to move from phone to phone and to make a report at each one about what they saw when they made a call and got on the air. A network of voices was thereby woven, a kind of aural Twitter stream that juxtaposed prosaic reports and testimonies of everyday life marked by subjectivity and poetic description.

News laid the foundation for a series of subsequent performances in which the basic structure was repeated: thirty people located in different parts of a city telephone and describe what they see at that moment. The calls are broadcast live through the intervention of Robert Whitman, who ends the call when the participant creates a coherent image.

In *21st Century Happening*, which took place in Leeds in 2002, Whitman updated the performance technology making use of cell phones that allowed a more mobile narrative to be created. In *Local Report* (2005), the participants contributed audio calls and video clips (recorded on mobile phone cameras) of the places where they were. The voice and video calls came in separately but were played together during the performance. During the thirty minutes that the performance lasted, a 'cultural map of the quotidian' was composed in real time. The reports were streamed live to the project's website and subsequently screened at five shopping centers in New York, New Jersey, Pennsylvania, and Connecticut. The choice of shopping centers to present the visual and sound recordings that made up *Local Report* highlights the hybrid boundaries of the project, which approximates to the experience of the quotidian through repetition, fluidity and even a certain banality as well as a sense of openness and possibility.

Whitman's performances *News*, *21st Century Happening* and *Local Report* are based on media networks and also work the network from an expressive and conceptual point of view to the extent that they create an assemblage of sonic and visual fragments and because they invoke the rhizomatic, diffuse and imprecise experience of our memory.

Cyberformance: The project *cctvecstasy* by WebCam Operators

In 2004, Jo-Anne Green, Michelle Riel and Helen Thorington (who make up the publishing project *Networked_Performance*) defined the scope of networked performance as being that of “[...] any live event that is network enabled,” including “any form of networking in which computational devices speak to each other and create a feedback loop.” [1] For the authors, networked performances are therefore characterized by being live or experienced at the moment of creation or reception and their origins lie in mail art and fax, telephone or satellite art. Nowadays, the ubiquity, convergence and mobility of digital media enhance the intensification of the experience of telepresence that is entwined in the distributed nature of networked performance.

In parallel, the concept of cyberformance, as developed by Helen Varley Jamieson in *Adventures in Cyberformance: Experiments at the Interface of Theatre and the Internet*, presents clear affinities with that of the networked performance, although it is more specifically inscribed in the participatory world of the Internet. In Helen Varley Jamieson’s words:

When I first coined the term cyberformance in 2000, I was struggling to find a way to describe this emerging form. I knew that two aspects at least were fundamental: location and liveness. The site for this new form was the Internet, or rather the overlapping and fluid spaces emerging between physical realities and the ethereal digital/electric space: a third space grafted from the real-time confluence of the stage and remote locations. [2]

We can therefore state that cyberformance is a subgenre of the vaster category of networked performance and it is precisely in the light of these concepts that we now analyze the project *cctvecstasy* by the collective WebCam Operators, which was developed in 2009 within the scope of the Radiator Festival in Nottingham. This cyberformance included participations by Paula Roush at the QUAD, Derby, Marie Josiane Agossou at South Bank University, London, Lina Jungergård at Area 10, London, Deej Fabyc at the Elastic Gallery, Sweden, Lara Morais and Maria Lusitano at the Malmo Academy of Art, Sweden, and Aaron de Montesse and Anne Overaa in their homes. Susana Mendes Silva was also a member of the collective but last-minute technical problems prevented her from participating.

The performance *cctvecstasy* can be considered a site-specific project to the extent that it took place at the online community WebCamNow.com, which establishes live webcam connections all over the world without the user needing to create a homepage or even a personal profile. The platform WebCamNow consists of a ready-made interface and is divided into two networks: the open area, which is licensed for adult content and is mainly used by participants seeking intimate experiences; and a second area, of family and friends, in which the participants know that their actions can be monitored. Unlike the more recent live streaming and social networks, which combine video streams and videologs, thus creating dynamic archives, the WebCamNow community does not make video files, images or messages available. Rather, it involves the use of webcams to broadcast live from intimate environments (webcamming). The WebCamNow interface includes video channels, text chat, and a bar that indicates who is connected to each video room, functioning as a popularity gauge similar to the life bars found in computer games.

Thus, after a period of research, the project *cctvecstasy* developed around a narrative suggested by the encounters between the performers and other participants in the community. The performances took

place on various video channels and questioned the conditions of reception and participation characteristic of the spectators and users of the WebCamNow platform. According to Paula Roush:

[In the open area of WebcamNow] a variety of hetero and LGBTQ (lesbian, gay, bisexual, transgender and queer) people operate their webcams, playing with multiple strategies: from the staged authenticity of those that set up the webcam in their rooms, placing their life under scrutiny, to others that masquerade into hyperstaged versions of femininity/masculinity and fetish, performing to a particular group of devotees. We used the webcamming and textual chat tools freely available to us to work synchronously across separate rooms and communicate with other videochat rooms. [3]

The performance took place online in front of a live audience at the QUAD Gallery in Derby, with seven performers on live streaming, while Paula Roush operated the transition between the various spaces. The audience itself was filmed and broadcast via a live feed to a video channel. We can therefore speak of a hybrid space at play in the cyberperformance *cctvecstasy*. From chat room to chat room, the various performances in turn become the subject of intervention by the performer, who is in the physical space of the gallery, alongside the audience, manipulating the visibility of the actions and spaces in real time.

Thus, it must be stressed that contact zones and transitional movements are expanded in this project: they are the interactions and overlaps of the users of the platform; the diluted boundaries between the banality of the quotidian images and the intentionally performative element; the interventions of the participants of the WebCamNow community in the real-time performance via chat; and, finally, the cross-pollination between the remote physical spaces inhabited by the performers, the telematic space of the World Wide Web, and the space of the gallery where the live audience is located.

In this context, it is pertinent to mention Susan Broadhurst's concept of the 'liminal performance,' which "plays with the limit of the possible" and whose fundamental characteristics are "hybridisation, indetermination, the absence of 'aura' and the collapse of the hierarchical distinction between popular and high culture." [4] In parallel, the notion of the 'intermedial audience,' proposed by Helen Varley Jamieson, is equally relevant since it simultaneously covers both online and live audiences who become mentally and physically involved in multiple tasks by assuming various roles – namely, those of spectator, performer, author, reader, commentator, chatter and voyeur.

It is also worth drawing attention to the low-tech and D.I.Y. (Do-It-Yourself) aesthetic of the cyberperformance *cctvecstasy* and the central role played by the webcam in creating an intimate, texture-laden space that awakens a desire to caress and hold the image, to pass to the other side and inhabit the space of the performer's body. The intimate gaze of the webcam is almost like the gaze that results from an amorous interlacing, in which we are too close to really see. [5]

Webcamming: The presentation of the self and participation in digital networks

In fact, the voyeurism associated with webcamming must be assessed in the light of this proximity, of the low-resolution of its image and the manipulation of its supposed aesthetic of authenticity. It is perhaps for this reason that masks are frequently used in cyberperformance practices. The mask highlights the mercurial nature of online identity and the mixture of fiction and reality at play in the telepresence experience precipitated by the networked performance. Effectively, an ambiguous play between hiding and revealing, simulation and authenticity, and intimacy and voyeurism runs through the artistic practices that emerge from digital networks. In this respect, attention must be drawn to Annie Abrahams's

body of performance work in which ‘communication’ and ‘intimacy,’ in their myriad variations, become ‘problems’ in the Deleuzian sense of the term. [6]

It is also worth highlighting the fertile dialogue that has been established between other artistic practices based, for example, on video and photography and the performativity of webcamming and, in a more general sense, the presentation of the self and participation in digital networks. A particularly interesting case in this context is David Valentine's film *Computer Love* (2010), filmed entirely on webcams. This fiction dance-film reinterprets the famous balcony scene from *Romeo and Juliet* staging an adolescent couple who exchange messages in a chat room named Computer Love (a euphemism for cyber-sex as well as an allusion to Kraftwerk's song of the same name).

The audience observes the young couple's reactions through images captured by webcams on their computers placed alongside a chat window in which we see a version of Shakespeare's dialogues in the highly abbreviated, pared-down language that is characteristic of instant messaging. The protagonists express the intensity of their feelings through urban dance (choreographed by James Hall and Joe Livermore of the Methods of Movement collective) and the messages in the chat window are echoed by the voice-over that recites Shakespeare's original text.

The tiny space of the young people's bedrooms is reduced still further by the static, vigilant and fragmentary gaze of the webcams; while the use of the split screen intensifies the expression of desire as well as the cultural and racial boundaries between the two young lovers. The use of webcams as a staging and filming device questions our relations of attraction — particularly those of digital natives —, participation and captivity in social networks.

In this context, the work of the photographer Evan Baden is also relevant; in particular his series *Technically Intimate* (2009) and *The Illuminati* (2007), which invoke the way in which teenage privacy and intimacy are being redefined by the Internet and mobile phones. In *Technically Intimate*, Baden takes as a starting point videos and images with sexually explicit content that he has found online. In the text introducing the series *Technically Intimate*, Baden explains how, on the basis of this material, he selected an image and subsequently worked with participants who answered the request for collaborators that he posted on social networks. The models adopt provocative poses staged for their cameras (mobile phone or webcams) but their status as ‘sex objects’ is re-contextualized precisely by the retreat of the point of view (of the photographer's gaze), which, in ‘opening up’ the shot, allows the quotidian space to enter the frame — the bedrooms full of objects and adolescent passions — shifting the sexually explicit meaning of the image and confronting the spectator with the ambiguity and discomfort that it provokes.

In turn, in *The Illuminati* Baden creates a series of portraits of solitary young people whose faces, suspended, hypnotized and absorbed, are bathed in the light coming off the screens of the gadgets that they are touching. In these photographs, the light that reveals their faces captures the adolescents' fixed gaze at a screen and a communication that we spectators cannot access because it is turned away from us.

In the face of this ambivalent dissolving of limits, the various artistic projects invoked here examine the current intensification of the flow of personal narratives on Web 2.0 and the new practices of self-surveillance and participatory surveillance on social networks. Effectively, while the potential dangers of surveillance on the World Wide Web are well known (particularly, the invasion of privacy, mapping and the management of information relating to particular social groups, fraud and so forth), according to Anders Albrechtslund, participative surveillance practices could also be considered as forms of subjective,

relational, shared and mutual experimentation. [7] In our view, the various artistic works being analyzed here address the irresolvable multiplicity of dimensions that traverse our presence, identity and participation in the digital world.

Conclusion: The hybrid space

In this context, we would like to conclude by invoking the work *Tele_Trust* (2009 – underway) developed by the Dutch duo Karen Lancel and Herman Maat in collaboration with the V2_Lab. *Tele_Trust* consists of a networked performance and an installation that investigates the relations between surveillance, privacy and trust in the public space and on digital networks.

Lancel and Matt created a ‘data veil’ inspired by the robes of monks; which also calls to mind a burka or Darth Vader's cloak (*Star Wars*). The dark and opaque fabric of this veil is weaved in a network of sensors that transform it into an interactive communication membrane. The performance *Tele_Trust* involves several interlinked data-veils and takes place in public spaces where members of the audience are invited to participate. The veil functions like a second skin: when the participant touches it she does not feel the sensors but the warmth of her own body. However, when the cloak is caressed, voices are activated in the headset, which ask her questions centering on the idea of trust. These voices belong to other members of the audience, who use their smartphones to communicate with whoever is hidden under the cloak.

Before being covered, the participant is photographed with a webcam and her photograph is sent to an online project database. When the participant attains invisibility under the veil, the members of the audience, by interacting with her via their smartphones, reveal her face online. It appears on the website of the *Tele_Trust* project, on the public screens of the installation and on the screens of the mobile phones accompanied by the questions: “Do I need to see your eyes to trust you? Do I need to touch you? Who is looking at whom? Who is controlling whom?”

The project *Tele_Trust* thereby helps us to reflect on the way in which interfaces can create an experience of presence and trust in a world impregnated with technology and media in which face-to-face communication is becoming scarce. In parallel, the participatory dimension of this work must be examined in the light of the notion of the “[...] digital aesthetic as *transmedial* experience, in other words, an interactive action or effect that involves hopping from medium to medium across a patchwork that makes use of intertextuality and ‘live’ recombination.” [8]

Questions, statements, short narratives about trust, intimacy and control created by the participants flow into the data veils that are active at that moment. All of the testimonies and contributions gathered during the public performances are available on the website of the project *Tele_Trust* and are activated and recombined when the data veils are used.

A mesh of stories generated by the users is interwoven, mediated by these sensitive and moving membranes which, in covering the wearers’ bodies, reveal their faces, thereby invoking the paradoxical play of hiding, transparency, nomadism and capture that traverses the ‘hybrid space’ [9] of contemporary digital networks. *Tele_Trust*, and the other artistic projects analyzed here, address the shifting experience of the hybrid space, marked by a conflation of presence and distance and blurred boundaries between intimacy and publicness, poetically and politically re-imagining our experience in this multi-layered and intensive networked spatiality.

Acknowledgments

This paper has been financially supported by the Lisbon Polytechnic Institute under the umbrella of the Training Support Program for Polytechnic Higher Education Teachers (PROTEC), run by the Direção Geral do Ensino Superior/Fundação para a Ciência e Tecnologia (General Board of Higher Education Teaching/Foundation for Science and Technology).

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The Body in Digital Space

Marco Cesario & Lena Hopsch

The aim of this paper is to investigate the perception of space in the context of digital architecture: if architectural and urban structures are designed for the experience of the body's motor faculties, does digital design, by modifying space-time categories of the lived-body and brain's treatment of spatial perceptions, open new paths of experience?

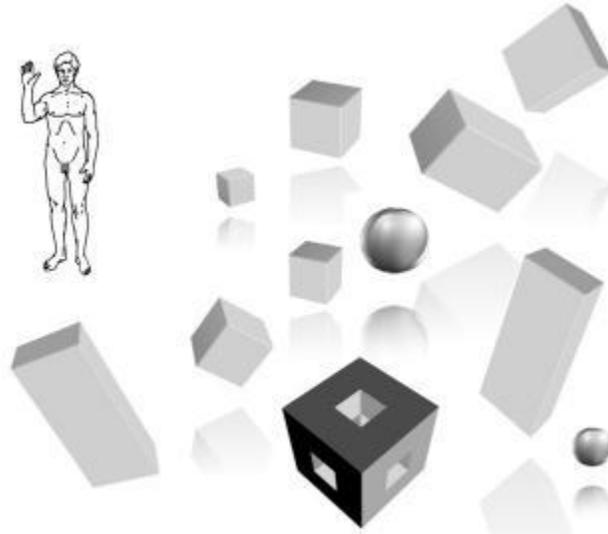


Fig 1. The Body in Digital Space © Marco Cesario

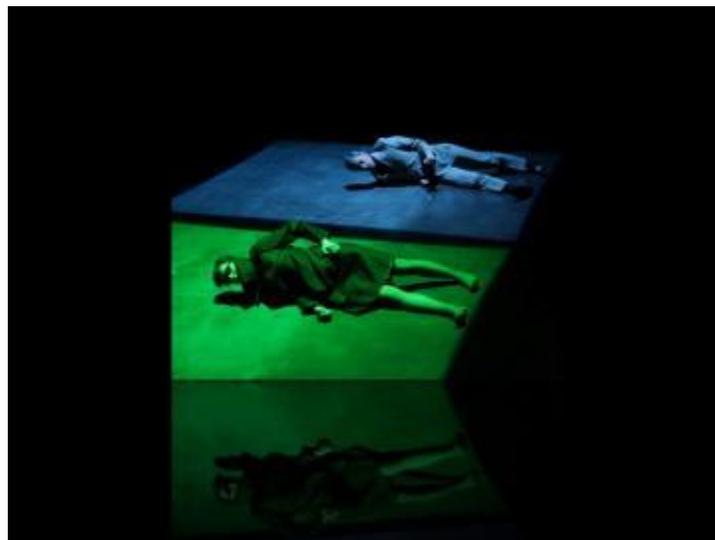


Fig 2. C'est bien d'être ailleurs aussi © Valeria Giuga

Flesh and Reversibility

In Merleau-Ponty's view the 'flesh' represents the continuity between a perceiving body and the perceived world. The flesh is the common element, the concrete emblem of a general manner of being including the subject and its environment; its meaningful expression is the 'chiasm' – the so-called reversibility - which is an immanent coincidence between the seeing and the visible, the touching and touched, the self and other selves. The body can touch and being touched, it can at the same time be the subject and the object of perception. Let us explore the idea of flesh further. The flesh represents the flesh of the world but also the flesh of the body which is self-sensing. The consciousness of our being-in-the-world take roots in this very original sort of primordial sensitivity for which we are included in a general self-sensing matter of the world. From this point of view there's an inner harmony between the external and the internal world and there's no categorical division between object and subject. When my right hand touches my left hand says Merleau-Ponty: "the 'touching subject passes over to the rank of the touched, descends into the things". The reversibility is a reciprocal relation not limited to the senses - to touching or seeing- but also to perception in general.

The Body in Space and Motility

In *The Phenomenology of Perception*, Merleau-Ponty, unveiling the primordial spatiality of the lived body and its original intentionality, disclose the fundamental relations between the body and space. At a first sight, the body's spatiality is external and the body is seen as an external object. In this perspective the spatiality of the body is a 'spatiality of position', related to an external, objective or intelligible space. The body is a mere object topographically located in a determinate position, occupying a portion of the objective space. In 1933 the Swiss psychiatrist Ludwig Binswanger, in his article *The Space Problem in Psychopathology*, explained the role of identification and orientation of the body in space through the study of mental illness. The spaces of our natural world are subdivided into the oriented human space and the homogeneous space of science, the tuned space.

The subjective experience of an 'attuned' space contrasts the scientist's oriented space characterized by the vertical and horizontal axis influenced by gravity. According to Binswanger space and time are constantly and subjectively assumed by the body. Space resides inside the subject and the consciousness is itself spatial. There's not one space and time but as many spaces and times as there are subjects. Instead of a 'spatiality of position', the perceptual experience of our lived body discloses a 'spatiality of situation', the situation of the body in face of its daily exploring tasks. Bodily space and external space form a system, the first being the background against which the objects as 'goals' of our actions 'come to light' and disclose themselves. Thanks to action and movement our body "is brought into being". When we analyze the body in movement we can fully understand how it inhabits the space because movement is not strictly submitted to space and time, it assumes them constantly through a here-and-now synthesis.

The Body's Posture and *Praktognosia*

Our primary link to the world takes root in space through an embodied consciousness which is motile/spatial. While moving in space, the body is able to incorporate direct spatial relations and make a dynamic and constantly-in-motion synthesis. According to the German psychiatrist and phenomenologist Erwin Straus, the human posture is a primary source of sensory awareness. Man's upright position

has an inner time consciousness of the world and the geometrical structure of reality becomes secondary to one's sense of time as duration in the world. Models of posture are consequentially projected onto changing spatial situations by the human body, whose position in space is constantly updated in order to interact with the environment. The communication between the body and the world takes place through a *praktognosia*, a practical and direct knowledge of the world. The body's posture is predictive because it assumes multiple or possible tasks and acts in an oriented-space connected with a historical time.

The intention of the body creates a space-time structure of here-and-now. The multiplicity of point of 'heres' constituted by the movement can be considered as a 'chain' of experiences in which each situation and perspective one and no more of them is presented in an objective way. Mathematically the movement - decomposed *ad libitum* - would open a *plethora* of spatial situations. The first access to the world is made through the movement of the body in space. This is the reason why we should consider the body's *praktognosia* not as a particular case of knowledge but as the original access to the world and the objects themselves.

***Kinesthesia*, the Sixth Sense**

According to the French neurologist and phenomenologist Alain Berthoz beyond the five traditional senses – touch, sight, hearing, taste, and smell – we should consider the sense of movement – *kinesthesia* - a 'sixth sense'. The body has a double immediate perception while moving: self-orientation (the perception of where we are located in a determined space with respect to certain landmarks in the environment) and object-orientation (the perception where specific objects are located with respect to each other). The body's ability to interact with the environment depends on the interaction between the two. From the external world we receive inputs recorded by our external sensory organs (exteroceptors): eyes, nose, ears. At the same time we receive inputs from the internal sensory systems (interoceptors). A particular internal sensory system is proprioception, which is composed of receptors and nerves in our bodies monitoring constantly the positions of our muscles and joints. It is a complex system allowing the body to keep its own balance and prepare fluid and coordinate movements such as in dance performances. The ordinary space relations are suspended because new forms of spatiality are cut out through the body's movement. The dancer, for instance, can experience an enlarged time because his internal-time consciousness is modified by the 'arc' of the body's movement. Sensory receptors contribute to the sense of movement. We can definitely argue that the body has a kinesthetic consciousness of the world because the origins of human knowledge reside in the body's movement and action.

The Body and Architecture

We are surrounded by architecture and constantly included in an architectural context. The architectural environment opens determined spatial experiences and enlarges consciousness by exploiting the multiple possibilities of the body's kinesthesia. The architectural context seems to show a 'motile essence' in which the user is immediately absorbed. The 'sense' of architecture is to open a whole perceptive experience to the body's kinesthesia. The hall of a building, its stairs seem to be conceived to experience the body's motor faculties. Not only distance, length and depth is experienced by the body but also a 'general sense' of movement arising from the whole building. If we have a look at some contemporary buildings it seems that there's a slow, hidden and general movement of the whole structure and that all the elements of the building create a sense of direction, of a moving structure.

In a complex building my body becomes part of a wider interconnecting system involving me and the architectural elements composing the structure. That's because in architectural design the building is

conceived as from a mental representation of the body in space, as from the exploring sense of awareness. While drawing, mind reproduces in scale the kinesthetic properties of a body moving in space. Mental reasoning about spatial environments is strictly linked with spatio-analogical representation criteria. In the architects drawing process his, mind tends to create and explore task-sensitive representations to achieve specified spatial situations for the human body.

The idea of space in architecture should be connected with the idea of a 'practiced space', in the sense of how this space is experienced beyond the geometric perspective including other sensorial experiences. The experience of a railway station by night for example: the wheels of an incoming train, far voices from few passengers moving towards the exit, the low, orange light of night lampposts. Or the experience of a park at dawn: birds, the faint, cold light settling on the buildings and the sound of the wind in the trees. Those visible and audio traces can alter the experience of lived spaces. The experience of space to be fully understood by the body should be total and include all the aspects of the senses. Changing the relationships in a sequence of rooms, for example, produces important transformations of the properties of space and in general has an impact on how intelligible people perceive them. There's a strict relationship between the geometrical properties of space and how we tend to recognize it.

The Body in Digital Space

The perception of architectural spaces is nowadays connected with the rise of technology and virtual reality produced by digital design. In the case of computer-aided architectural design - in which the architect can manipulate visual representations - architectural spaces gain a new reality by supporting the creation of new architectural objects. In this process, the constituting elements of a building become technical networks of communicating nodes. Digital design becomes not only a way to create new objects but also a support for communicative and intersubjective platforms which could be considered means of mediation between people. Every part of the model is individually defined and can be created without referring to other parts of the model. In a computer model in which the architect presents a building, we can easily use a specific coordinate of the building, a determined point, a node or an architectural object, to develop news plans or physical models and create a whole building from it. During the design process every aspect of the model can be modified. This is the reason why we often have the perception that the whole structure is constantly in movement.

By the development of computer technologies such as computer aided design (CAD), virtual environments (VE) and virtual reality (VR), architects have an endless number of possibilities of representation. Designing in a digital environment allows the architect to shape and re-shape the design continuously with less effort. But, as pointed out by Alicia Imperiale, the interest of architects is shifting from 'Derridean deconstruction' to 'Deleuzian focus on smooth space, serial and dynamic process'. By the use of different mathematical calculations the architect strives towards a surprising, innovative element in the design process.

Imperial points out that nowadays in contemporary architecture, the interest is no longer focused on designing spaces but entirely on the surface. In the new digital architecture the space as a proper object of architecture is mainly neglected. Often, the interior of a building is simply the concave part of the convex exterior surface, its internal opposite. Space becomes the residual part of the 'skin' or the 'mass' of the objects. Space is not 'designed' specifically and doesn't seem to have properties or a specific architectural nature but it becomes a derivative space, 'what remains' between different masses of the architectural objects juxtaposed. If computer programs can aid and even contribute to the design of an object what about the design of space and what impact on the body in digitally designed spaces?

In the virtual context of digital architecture the body oriented space is modified and the original movement is replaced by an exploring virtual body projected by the mind inside a non-Euclidean and non-or-

thogonal context. The most perceivable information is mainly visual rather than auditory or tactile. Virtual environments surely provide benefits on all phases of architectural design process and digital 3D models – being similar to physical models but without its tactile qualities - improve the perception of designs and the whole spatial perception of a building. However those technologies provide feedback for only three of the five senses. If the visual, auditory or tactile senses are concerned, smell or tactility is not included in virtual environments. Above all, kinesthesia – the sixth sense that we discussed above – is totally cut out since digitally produced models often lack a sense of scale.

A space which is not assumed and experienced by the body and its movement remains an artificial space created ad hoc to be close-like to the body's reality and doesn't represent the whole multi-sensorial human experience. We are still in the homogenous space of the science; digital space has mathematical and geometrical properties but is yet not conceived to be experienced by the body's kinesthesia and could therefore be misleading. The objects created can be wonderfully realized and can constitute an original experience for humans but they are conceived as detached, opaque objects in which lived space is derivative and the body's movement is approximate, compelled secondary.

Conclusion

The sense of movement, as we demonstrated above, is crucial to provide access to the world. In conceptualizing space the cognitive theorists Lakoff & Johnson points to how: "The body is not merely somehow involved in conceptualization but is shaping its very nature". The decisive role of the sensory-motor system for human understanding and perception of space is crucial. How we perceive spatiality and interpret space is the common denominator for both the cognitive and phenomenological perspective.

While drawing the architect "thinks in drawing", his hand reproduces on the paper a symbolic world following an 'inner vision' - the mental representation of an achieved building. In a virtual environment the process of creating through 3D software creates an alternative reality in which the Demiurge-Architect has endless possibilities to create and manipulate objects and in which aestheticism becomes the priority rather than the laws of gravity. An 'inner vision' is replaced by software defying the laws of physics.

The body is no longer the centre of the architectural project. While drawing, the mind creates spaces according to a bodily consciousness – the experiences of the body in physical space. Mental representations of those experiences can support the creation of new artificial spaces.

However, in a virtual environment, the space is not conceived to be experienced by the human body and the attention is no longer focused on the impact of the achieved building on the environment or on human lives. From this point of view digital architecture – whose main purpose seems to be the design in itself and not the concrete architecture - appears 'detached' from human life and devoid of any link to the concrete existence. Bodily space should be the core of the process of architectural design because any structure will be experienced, lived daily by humans. From this point of view, architecture shouldn't simply manipulate or juxtapose architectural objects without any link to the physical existence. The structure of buildings should reflect our being-in-the-world. Putting the human body and its sense of movement in the centre of digital architecture would be a new frontier for exploring the multiple nature of human perception. A 'spatiality of situation' should guide the work of the architect rather than a 'spatiality of position'. Therefore we need to consider the context of the 'flesh' – the intertwining between the body and perceived world – the fundamental ground in order to grasp the intimate nature of space.

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Photography, Reality and Digital Expression

Orhan Cem Çetin

Photography is a superficial representation of the human experience and it is shocking and surreal compared to reality. Since photography is a dramatic abstraction, going further is not a diversion from its nature. I have been using the digital media for full creativity and ways of integrating into the image further aspects of human experience of the moment, while the image is still a photograph with strong ties with reality.



Fig 1. Untitled, from the Renkarnasyon series, 1993, (c) Orhan Cem Çetin



Fig 2. Untitled, from the Renkarnasyon series, 1993, (c) Orhan Cem Çetin



Fig 3. Untitled, from the Renkarnasyon series, 1993, (c) Orhan Cem Çetin

Coexistence of a variety of art disciplines implies that each discipline is very powerful in unique ways while lacking or extremely weak in others. Hence, there is no omnipotent art form. However, artists from different disciplines tend to believe that their own areas of practice have greater potential of expression over others.

Photographers are no exception.

The powers of the photographic image are probably obvious to a photographer. What is not so obvious are its shortcomings and limitations.

How well can a photographic image represent human visual experience? Can the strong ties with reality in certain cases work against the photographer?

The photographic image is an extremely subjective, in fact a shocking and distant representation of reality. It is impossible to avoid the subjectivity and vagueness inherent in the photographic process.

Breaking the assumed link between reality and photography will provide the photographer with further freedom, creativity and self-expression. Use of experimental techniques enables the photographer to highlight his/her personal touch. Traditional photography yields images with extreme visual resemblance since similar cameras, lenses, printing processes etc. are used.

I made two critical decisions about my artistic work in photography:

- The overall technical quality of a photograph must be only as much as required. No more, no less.
- I do not strive to represent reality. I strive to represent how reality appears to me.

Experimenting with early digital imaging techniques made me realize the potential of:

- Unlimited trial and error.
- Instant feedback.
- Huge room for serendipity.
- Total responsibility over the result, as I could have altered it but did not.
- More options for developing a personal style.
- Being able to drift further away from the sense of reality while keeping the photographic characteristics in the image.
- Working on an image turns into a performance as one can improvise on the go.

Presentation includes examples from my following series:

Earliest digital work: **Renkarnasyon** / 1993, Hand scanned prints, digitally altered, colored and exposed back on photographic film.

Stolen Dreams / 1995, Flatbed scanned prints, digitally combined, colored and exposed on color negative film to produce c-prints.

Ticket / 2001, Scanned negatives / transparencies, digitally colored and pigment printed.

And recent work, back to gross experimentation: **Press** / 2011, Digital camera images manipulated in image processing software, Pigment or Lambda c-prints.

Privacy in the house of the future

Aleksandar Cetkovic

How will the architecture of our most private of all places, our home, change when the Ubiquitous House, with its ubiquitous sensors and activators to control all kind of daily functionalities, gets hooked to the net and its information about us, placed at disposal of large companies? Will we take different roles in real life, in order not to give away our real identity? Or will the notion of privacy, as we know it, simply disappear?

The house of the future is usually portrayed as the Ubiquitous House. Derived from Ubiquitous Computing and House the term describes a house in which its technologies are interlinked (LAN, Wireless) and communicate with each other to create a smart environment and control the different functionalities of the house. The main focus of such an environment is the inhabitant. The scanners observe the inhabitants in order to control the different aspects of space, including lighting, air conditioning, heating, humidity etc. The development efforts go into the direction of creating an intelligent house – intelligent in the sense that it learns by observing the user's reactions to specific situations or deploys resources intelligently. This might sound very sophisticated and reasonable but at the same time, it means that the privacy of the user is analyzed and digitally stored. If the gathered data stays in the user's possession it is not an issue, but could become very troubling if it gets into wrong hands.

The subject of privacy in a ubiquitous house has been intensely debated, being crucial for the general acceptance of the whole idea in the private realm. In this paper, I do not intend to add to any of the technological solutions already provided or proposed to keep the collected data private; instead I want to analyze the social and architectural aspects of the idea and to compare them with some of the privacy issues on the Internet.

Privacy

We all understand the term privacy, yet when discussing privacy there are different definitions and views depending on the discipline and the context in which the term is used. Merriam's Dictionary defines privacy as: "the quality or state of being apart from company or observation: seclusion," but the dictionary definition seems vague.

For computer science and ubiquitous computing privacy is all about storing personal information in digital form and who has access to it and when. As Katie Shilton puts it: "Privacy – the ability to understand, choose, and control what personal information you share, with whom, and for how long." [1]

Then again, for the architect, privacy is all about the place of intimacy and where we can express our private selves. As discussed in Juhani Pallasmaa's *Phenomenology of the Home*:

We have private and social personalities, and home is the realm of the former [...] The secrecy of private lives concealed from the public eye structures our social life. Home is the place of intimacy where we hide our secrets and express our private selves. Home is our place of dreaming and resting in safety. [2]

Therefore, the debate around privacy is not only about the home being a private place, but also about the consciousness of being in a private area, where we can express ourselves as we are.

“Privacy is necessary for people to become properly moral thinkers and persons. We need to reflect on the things we want to do, and the space for reflection is typically private.” [3]

The question arises if the awareness of being observed by different gadgets in our own four walls still makes us feel 'at home' or will we be more careful about the way we express ourselves?

Another aspect of privacy or the notion of private space is that the interpretation may change over time, depending on factors such as culture, crowding, context or amount of room around us, as Edward Hall pointed out in his classic *The Hidden Dimension*. [4]

Architecture and Ubiquitous Computing

The future technology involved in the Ubiquitous House will be difficult to grasp as a phenomenon. Most probably, it will not enter our homes as one all-embracing product, but gradually, in small portions, in form of distinct systems that control different aspects of our house. The sum of all these systems will build up to constitute the Ubiquitous House. Even if the systems will not communicate with each other (probably at the beginning), the objective of their surveillance and analysis will be the same – the user in the home.

In the Ubiquitous House, the user needs to be surveyed to accommodate and automate his needs and wishes; the house is supposed to become a machine anticipating desires. To achieve this, the technical environment measures every movement and action, embeds the situation in an environmental description of the moment, and stores the data together with the intentions of the user (in the form of activated functions) to analyze them over time and predict future needs and actions. The combination of all the collected and combined data creates a digital image of the user, a digital alter ego corresponding to the measured actions he or she repeats over time in the house.

What is disturbing is that this digital representation is omnipresent and very intimate in its nature. Each recording (for example, turning on and off the light, entering a room, opening a window) might be harmless and trivial when singular, as it describes only the activation of certain functions. However, in the combination of different recordings and spread over time it provides a picture of our habits.

On the one hand, they could give a fascinating picture of us, our everyday practices, and personal and cultural conventions by which we live; on the other hand, however, expose our irrational acts, reveal unconscious personalities or even unveil oddities and eccentricities. In its objectivity, the recordings would not be too picky about the details. The house could help us control our health, pre-empt diseases, calculate and order food and household goods. It could even listen to our interpersonal conversations to interpret our intentions, moods and social interaction to be able to intervene appropriately (dim the light, turn on soft music in case of a romantic mood, or shut the windows and doors if a loud discussion is not intended for the ears of the neighbors).

What is interesting is that not only our habits or our conversations can be analyzed but also our behavior can be predicted. Researchers analyzing social habits in social networks, such as Facebook, MySpace, LinkedIn and so forth, were able to predict which individuals were to become couples by observing how intensely one person was checking another person's profile. [5] Social networks have become a popular source for Sociology and Social Psychology. Collecting data in the house would provide even more comprehensive measurements of homo sapiens. Masses of data, allow us not only to analyze the individual,

but can even lead to define patterns of behavior attributed to social groups or even mankind in general. The user becomes fully transparent (der gläserne Mensch) when the recordings in the house are combined with the digitalized thoughts, interests and discussions of the individual on the Internet. The general behavioral patterns discovered by the researchers, allow then interpreting the behavior of the individual more easily.

It is precisely this kind of information that the researchers hope to reveal and to adapt the house and its technology to our needs and predict our desires: the house of total comfort, ease and no-brainer.

On the other side, it reveals our private side. There would be no hidden sides that we could live out in private, irregularities that make us different, no intimacy. Privacy as we know it would disappear.

Our reaction today to such a radical cut in our privacy is uncertainty, fear, distrust and rejection of any such system. Of course, nobody plans to take away our privacy or break into the serenity of our home. Most of the researchers and visionaries in the field of ubiquitous computing are also confident that the data collected would stay private. Beside the research on how to realize the Ubiquitous House, there is a consensus that this could be only achieved by keeping the data private; research to make such systems intrusion-free is in progress. Apart from traditional security measures denying access to digital data, different strategies for keeping data secret have been presented: anonymizing data; introducing special personal access keys; [6] storing relative as opposed to absolute data; [7] determining privacy settings that can be negotiated with the sensors. [8]

Many aspects of the technology will make it inevitable in our houses. In Japan, which is confronted with a demographic problem of over aging, huge efforts have been invested in Gerontechnology – the use of technology for the aid of the elderly. Many fascinating ideas have been produced, proving that introducing ubiquitous computing in the house is worthwhile, like the iPot, [9] a kettle for the elderly living alone, that sends out signals how often it is used, thus telling the relatives indirectly that all is well. It is a good example of combining cultural aspects, such as the continuous use of hot water in Japanese households, with a discrete but aware element of surveillance.

The changing patterns of human-technology interaction have an influence on how the built environment is perceived, especially in a surveyed environment that interacts to our needs and environmental conditions. Even the term privacy and what can be labeled as private is undergoing a dramatic change.

This shift in the understanding of privacy can partially also be seen in architecture.

Architecture and Privacy

In his book *The Un-Private House* [10] Terence Riley analyzes the changes recently undertaken in the private house. Examples he gives describe the new tendency of the residents to expose themselves to the public, as displayed in different strategies of housing. For instance the public gaze can enter more or less unobstructed in the house (Michael Bell's *Glass House*, Shigeru Ban's *Curtain Wall House*, Neil Denari's *Massey House*), the public is mediated in the house (Lupo/Rowen's *Lipschutz/Jones Apartment*, Herzog & de Meuron's *Kramlich Residence*, Hariri & Hariri's *Digital House*) or the house is designed as a reception for the public (Michael Maltzan's *Hergott Shepard Residence*). These are only some examples in a trend of opening the house to the public.

Modern architecture has provided us with lofty and open rooms; glazed facades that let the light in and at the same time open the inner life to the gazes outside. Winy Maas from the architecture and design practice MVRDV said:

Putting the inside, even your own, on display seems a very modern topic. It might be perverse but it has similarities with the mixture of privacy and publicness these days: walking on the zebra crossing and listening to the love conversation of the neighbor who is phoning his girlfriend, the way people show their privacy on the television in order to attract attention. In such a condition the ancient limitations between privacy and publicity seem to be irrelevant.

With new media, television and radio, the telephone and especially the computer, the public has entered the home. The interconnectivity with the computer has made the far-away present in the house more than ever, with the web-cam allowing the presence of a public that in physical sense would never have been able to fit in the home. There are individuals that expose their private sphere readily 24/7 on the Net; the first and quite well-known was jennycam (Jennifer Ringley) who attracted a large community that consumed this sort of exhibitionism.

Privacy and Internet

The discussion about private and public has long left the focus of the house/street discussion and shifted to the Internet. Yet, this shift allows us to observe the way private data is harvested on the Internet, to give a glimpse of strategies that could be used to collect digital personal data, for different reasons, in the real world. There is an ongoing debate on the ethical and juristic consequences of collecting data in the public – where most of us believe that an individual disappears in the masses or is hard to trace in the amount of data produced. However, the latest developments in surveillance technology have shown that to stay anonymous in public, precautions have to be made.

Internet strategies – such as those of large companies offering free mail accounts, free chat and VOIP-communication in return for data such as addresses, links, opinions and other information that can be extruded out of Internet habits – could be shifted towards information harvesting in the city and its buildings. Already big companies such as Google, Apple and Microsoft collect information based on our location and what actions are linked to that place – for what purpose is yet to be seen. The studies on Internet privacy [11, 12, 13] are not as much intrigued with how privacy is carelessly exposed, but to what extent it is willingly given. There is, of course, much ignorance, disbelief or just plain naivety in respect of the capabilities of consumer companies to collect information about individuals or their capabilities to harvest such details out of the sheer flood of data. The existence of companies that just handle – not collect – data on the Internet contributed to people or companies show the extent of development in this field. Experts are already discussing the market of such data, data-banks and exchange markets (like stock markets) for such collections of data as the next big expansion-possibility once the money-markets get more regulated. [14]

However, what is really surprising about diminishing privacy on the Net is the behavior of certain parts of the new generation, which has grown up with the Internet. On the Net we find individuals who see their private-data as a value or means to exchange for online-services. For instance, individuals who use the Internet to propagate themselves: in the run to avoid the trivial and anonymity, all aspects of life get published. Thus, not only to impress the (virtual-) friends, but also in the hope to become famous: the Net sieves the information to find some poignant and exciting aspect that is worth propagating. That

this strategy can backfire is one of the lessons yet to be learned, as the Internet will not forget, even if we as individuals might change over time.

Internet strategies applied to the Ubiquitous House

In a thought experiment, I would like to employ strategies from the Internet for collecting user data in the Ubiquitous House.

Big food companies could offer household appliances such as free fridges in return for our consumption information. Whenever milk, butter or eggs would be used up, the company would automatically deliver the goods directly to the fridge. This would bring the advantage of time-saving and continuously fresh supplies for the consumer and for the company the guarantee of consumer-loyalty/dependency relation and ease of just-in-time logistics of food supplies through availability of consumer data. Furthermore, the collected data of user behavior can be sold on the information market. Combining different information sources, allow creating a precise user profile. The consumer habits in the house can be combined with search information and order habits from the Internet. This profile could be used to create new marketing strategies and produce product desires tailored specifically for the user. Moreover, new services that would make life easier in the house would be provided to the user, again 'free' of charge, so that the user gets tempted to deliver more crucial information about his or her behavior. Life in the house becomes a commodity. Our actions, our consumption habits (material but also energy, free-time, social and other immaterial habits) our cultural and religious habits, even our health-data – all can be swapped for seemingly free services that would allow companies to design products tailored to our needs.

The role of architecture in privacy of a ubiquitous house

As Katie Shilton appealed to the designers of ubiquitous technologies not to abuse the privacy of the user and to store only relative data, I think it is up to the designers and architects designing ubiquitous houses to provide the users with a choice by showing the possibilities of the ubiquitous environment through transparent design. Maybe 'surveyed areas' and surveyed objects have to be distinguished, so people are aware of being registered by what sensor. Something like work by the artist group "made," who painted surfaces in public areas which were surveyed by CCTV cameras; distinguishing scanned areas so as to allow the public to choose if they wish to be registered or if they want to stay out. This visualization of the surveyed spaces and uncovering of the gadgets involved is clearly opposing the vision of ubiquitous computing in the house as originally defined by Mark Weiser, [15] who envisioned gadgets being pervasive but out of sight. I would state that uncovering or making sensors visible and areas that are observed obvious, would make the user feel more in control of what he is giving away and when; thus more at ease.

Another possibility is to create rooms or surfaces that are surveillance free, giving the user the certitude of private areas, and other parts of the home where the user is conscious of the possibility of being observed. Just like the modern open apartments where the dweller is conscious of the possibility of being observed in the living room by the odd passer-by and at the same time having the confidence of being unobserved if the blinds are pulled down. It is up to the user to choose.

Conclusion

With the paper I wanted to state that the problem of privacy in the Ubiquitous House is not necessarily only a technological one but could also be seen as a phenomenological problem. Looking at the strategies of data harvesting on the Internet today, it is more probable that the user of the Ubiquitous House would be giving parts of private data voluntarily as opposed to them being collected illegally, however the combination of different sources of data could then be quite revealing.

In contrast to conscious providing of information on the Internet, we don't know what is revealed in the Ubiquitous House as the data is produced through (unconscious) actions of everyday life. Awareness of the omnipresence of scanners in a house changes the role of the home for its user. If we cannot perceive the technology around us, but are nonetheless aware of it by registering the reactions to our presence or our actions, inevitably we will ask: "What information is being collected, when, and what happens with all the information?" Seeing where the sensors are and apperceiving the causality of reactions in the house to users actions, would not only propagate a sense of control but would probably allow creative interaction, turning the ubiquitous technology into a real tool.

Thus the option of integrating the visibility and awareness of surveillance in the design of the home of the future and giving the possibility to stay unobserved when desired are important parts of gaining the confidence of the user in the abilities of the Ubiquitous House and providing privacy in the house.

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Elephant : The Construction of Contemporary Representation Images

Rattapol Chaiyarat

In contemporary culture, the surface of information is thoughtfully constructed; it contains visual material that symbolizes nature and artifact. The work demonstrates the reality of how we view elephants and relate with the different representations informed by contemporary and cultural environments.



Fig 1. Stonework, 2004, Rattapol Chaiyarat, Digital Image.



Fig 2. Untitled 2, 2009, Rattapol Chaiyarat, Digital Image printed on photographic paper, 60 x 60cm.

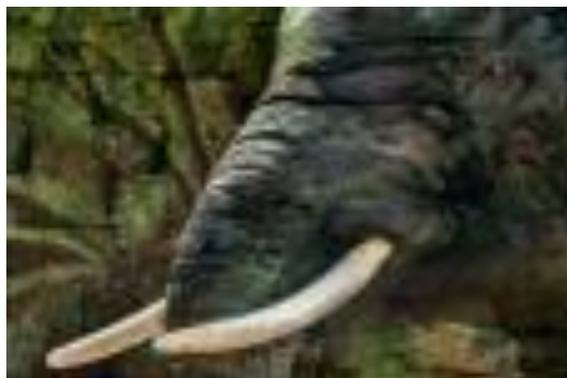


Fig 3. Untitled 3, 2009, Rattapol Chaiyarat, Digital Image printed on photographic paper, 60 x 85cm.

Introduction

This research is aimed at constructing and creating a body of work that communicates, in digital imagery, key issues around the contemporary representation of Asian elephants. To develop this work I will investigate the changing role of the elephant in Thai culture both in historic and contemporary terms. A significant direct interest in this research is the power and effect of “visual culture.” [1] My artwork is a fabricated simulation, created and constructed from image material. The animal images are digitally manipulated into illusions and investigate how humans experience nature through visual contemporary culture. In this way, I relate with different kinds of visual representation for their specific forms and effects.

Objectives:

1. To investigate the construction of image and representation of elephants in contemporary life.
2. To create a body of artwork that communicates in digital images, and an expressive commentary on the contemporary representation.

Contemporary context: Cultural Representation

As Stuart Hall asserts in his book *Representation: Cultural Representation and Signifying Practices*, “It is us – in society, within human cultures – who make things mean, who signify.” He adds,

Meanings, consequently, will always change, from one culture or period to another. There is no guarantee that every object in one culture will have an equivalent meaning in another, precisely because cultures differ, sometimes radically, from one another in their codes – the ways they carve up, classify and assign meaning to the world. [2]

The process of creating meaning is complicated and each culture has its own way to construct and communicate through signs and representations. However, in recent years, the globalization of the Internet has been increasing and it is not unusual for us to be able to experience contemporary signs and representation from different cultures.

As Nick Lacey writes:

Saussure’s description of signs, [...] is important in Media Studies because it emphasizes that they are social constructs; they do not possess inherent meaning. Once this is understood, the task of analysis is to deconstruct not individual sign, but sign systems to show how meaning is created. [3]

We have been experiencing – and probably creating and contributing – new meanings and representations to our society for quite some time since through our global social media network. People across the globe are able to exchange experiences and ideas through new media and learn about each other through culture. Artists are able to present their works through these new media channels; they can express their creations through signs and representations. In *The Concept of Representation*, Hanna Fenichel Pitkin writes that:

The artist “represents” his object as something, or as having certain characteristics when he depicts it, makes allegations about its appearance. [...] When he represents something by a symbol, that symbol

may well be a recognizable object, but it need not be and usually is not a representation of what it symbolizes.” [4]

Representation can be constructed by using a set of objects or symbols, and it can be interpreted by linking specific facts of each symbol together to create meanings. “In the *constructionist perspective*, representation involves making meaning by forging links between three different orders of a thing, [...] and the signs, arranged into languages, which ‘stand for’ or communicate these concepts.” [5]

In contemporary art practice, representations of animals are therefore not only about the reality of the animal itself but also the associated symbolism and cultural values that we attach to animals. The material appearance of Olly and Suzi’s *Cheetahs* (Namibia 1998), [6] for example, collaboratively create a painting on location. The photograph presents a painting of cheetahs that is surrounded by the animals themselves in their natural habitat. The work is focused on environmentalism and the conservation of endangered species. There are some other artists, such as Sue Coe, Frank Noelker, and Britta Jaschinski, who have used their art to address the confinement or mistreatment of animals. [7]

Research Methodology

This current research is focused on the construction of representations of elephants by using visual methodologies to explore contemporary images of elephants and the consequent impact on perception; aimed at creating a body of work that communicates its findings through digital imagery. To develop this work I will investigate the visual material in terms of cultural significance and social practices.

The Construction of Contemporary Representation Images

I use photographs as tools to generate digital images and create new meanings by combining surface information that represents the animal in contemporary life. Digital manipulation allows me to combine different images which contain several symbolic meanings together. *Stonework* (2004), for example (Fig. 1) is a natural raw material that retains its qualities even when crafted and manipulated by humans to become a more meaningful artifact; therefore, it symbolizes human civilization and cultural heritage.

In *Untitled 2*, 2009 (Fig. 2), the brickstones connect the elephants with ancient man-made structures and traditional heritage. Centuries have passed by, but the stones are still there with the trapped animal, suggesting the core of our culture continues on. Brick by brick, block of stone after block of stone, we shaped them up into whatever we would like them to be. The image perhaps reflects how humans have tried to occupy and colonize the powerful raw materials of nature.

Untitled 3 (Fig 3.) represents the way humans view animals in captivity through bars, fences and boundaries, which are completely changed in appearance to an invisible enclosure. An elephant is merged with leaves and branches; its skin is almost blended together with the captive environment.

In captive environments that are open to the public, such as zoos, visitors are not only viewing the actual animals but also the visual material that represents their natural habitat. The enclosures effectively stimulate viewers’ reactions actively relating them in the process of experiencing nature.

The images also demonstrate the animals on display in contemporary society. We love to look at them and appreciate the greatest living figures. We place them in our society and celebrate our triumph over

nature. The work is another example of reconstruction and exploration of visual representations from different materials.

Conclusion

My works *demonstrate the construction of contemporary representational images of elephants. The visual culture that surrounds our everyday lives has a huge effect on how we construct and interpret our experiences.* I often use the animal identity and its environment; representing them as a metaphor for issues and concepts affecting contemporary culture. Images of the animal itself form a very important solid layer of information for my work because it already deals very effectively with something that has an everyday existence as well as social and cultural associations because of its history and relationships with mankind and the natural environment.

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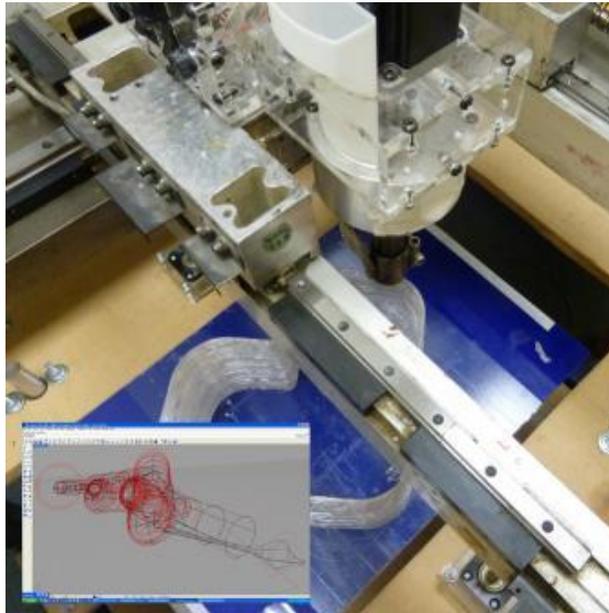
Digitaterial Gestures – Action-Driven Stererolithography.

James Charlton

Attempting to reconcile a digital sensibility with sculptural materiality steeped in the modernist legacy of “truth to materials,” we can conceive of a form that is generated outward from its central core. Reflecting on the theoretical implications of the generative process this paper explores the nature of digital materiality as a heterotopian space comprising of and uniting artist, material and process.



1. *FORMø/12*, James Charlton, thermoplastic extrusion, Copyright James Charlton.



2. *FORMø: 3D Printer and Generative Software*, Olaf Diegel, photographic documentation, Copyright Olaf Diegel.



3. *FORMø: Process Documentation*, James Charlton, stills from video, Copyright James Charlton.

Through what passes as a high-speed network in New Zealand I SHIFT/CLICK/ZOOM through the Quick Time Virtual Reality (QTVR) of Brancusi's studio in the Centre Pompidou. [1] Here, in this carefully manicured space, I can indulge my voyeuristic urges – rummage around the private inner sanctum of the artist's 'creative' process, lingering on every (contrived) residue, every 'casually' placed prop that poses as a creative artifact.

It is at the tool bench the artist's presence is most visceral: hand-worn tools and other signifiers of the making process litter the bench. Every 'discarded' shaving is given new import by the museum handrail that even in this virtual space asserts credibility. Here, surely, is the authentic act – the point of closest communion not simply between artist and audience but between artist and product.

It is in seeking this point of contact between the maker and the made, the making and the maker that the project FORMø will be discussed.

FORMø is an interdisciplinary collaboration between artist James Charlton and engineers Olaf Deigle, Sarat Singamneni and B. Huang. Working within the Creative Industries Research Institute (CIRI) at Auckland University of Technology, the project received Smash Palace funding under the partnership program between the Ministry of Research Science and Technology and Creative New Zealand. [2] The fund supports collaborative projects between teams comprised of loosely defined New Zealand scientists and artists. The emphasis of the fund is on the cross-disciplinary sharing of knowledge and exploration of methodology rather than applied outcome.

The project developed out of the dialogue between Design Engineer Olaf Diegle and Artist James Charlton in 2008 around the use of rapid prototyping technologies in creative practice. From this exchange Charlton produced a number of works that laid the foundation for this project, for instance *16:sec*, in which sixteen seconds of video was used to generate a series of rapid prototyped forms.

In Charlton's writing about this work, we find the concerns that have driven the conceptual direction of *Digital Gestures: 16:sec* "explores the construction and perception of time-based events by examining the ability of static objects to encapsulate temporal information. It aims to question our relationship with physical objects and the static concreteness that we assume of them, [...]" [3]

The relationship between Diegle and Charlton at this stage was not fully collaborative in nature. Diegle's expertise in rapid prototyping was being applied by Charlton in order to realize his ideas. What developed from that dialogue was an exchange of ideas about form, materiality and time in the context of fused deposition modeling and the authored gesture.

From this point of convergence, FORMØ proposed to realize a system through which the performative gestures of the artist are translated into concrete form by integrating motion capture technology with real time 3D printing.

The approach was to develop a concept machine made by modifying an X-Y axis system from an electronic pick-and-place machine that allowed for a print area of approximately 600mm cubed. The completed platform provides an X-Y axis that moves the print head along the vector print path and a Z axis which moves the build platform down by a unit of measure. The motor control system consists of four stepper motors (one for each axis, and one for the extrusion head), a Xylotec XS-3525/8S-4 Stepper Motor Driver Board, and an Olimex LPC-H2148 Microcontroller Board allowing for simple control of the 3D printer through a PC-based CNC machine control program called Mach 3 CNC. A custom-made thermoplastic extrusion head allows for granules, powder, or plastic to be extruded. (This system served the development phases of the project; it has subsequently been replaced by a Mitsubishi MoveMaster-EX five-axis robotic arm. This system is still under development at the time of writing.)

Initially, print data was generated using an OptiTrak V100:R2 six-camera motion capture system and Arena motion capture software. Even in this simple six-camera set-up the limitations of software designed specifically for animation purposes became evident and the motion capture equipment was quickly left behind in favour of a customized motion detection software system.

Experiments using color tracking proved much less cumbersome and more manageable but still required controlled lighting and trackable color markers that worked as an interface barrier separating the artist's hand from the digital expression of form, and theatricalizing the work. By switching to a Kinect depth map camera system and defining the sample space depth, accurate motion capture of hand gestures provides clean data for the printer.

The Kinect was hacked using MAX/MSP to extrapolate data for XYZ and direction for two hands to send to the Rhino plug-in Grasshopper for real-time form visualization and compilation. The flexibility of this approach using graphic programming interfaces to process the raw data enabled the team to experiment with and conceive of algorithmic methods of generating forms from the spatial data.

Put simply, instead of thinking that a hand moving in space would correspond to a similar movement by the printer, multiple points on the body could be combined to determine the position of the deposition head.

Through this train of thought, it became clear that the project was not thinking simply about virtual drawing in space but was attempting to understand how the artist's actions could interact with digital material. The notion of digital material is perhaps paradoxical. [4] Perhaps there is not even such a thing, or if there is it refers to things arising from a digital process – an image, a document or a 3D-print. As I attempt to explore this notion of digital materiality it will become clearer that what I am really speaking to is the non-material being of the media without manifestation – media as a concept in relationship to process.

This paper seeks to frame the project in these terms – as an attempt to reconcile spaces within a heterogeneous space that might constitute a new understanding of the materiality of the digital.

Collapsed Spaces.

Unlike the rarified and idealized modernist studio where singularity of discipline, intent and technique assume one source (the artist), FORMØ operates across spatial, modal, disciplinary and temporal sites.

In practical terms, there exist two primary sites: the site of production and the site of reproduction – in this case the artist and the 3D printer. Initially the challenge at this practical level seemed simply to eliminate the latency between these sites, bringing them together as one event. This might be thought of in traditional terms as seeking the same immediacy that the sculptor's hand has on a lump of clay or the painter's brush on a canvas, but is also evident in contemporary digital media practices such as video production, where the artist's gaze carves its way through time, or in some forms of installation and performance work. (I don't want to labor historical metaphors here but it is useful to ground the ideas in physicality of media when trying to understand the materiality of the digital.)

I am then suggesting that in direct manipulation of media – the visceral effect of the artist's body on materials – a synthesis of space is achieved by collapsing the spaces of the body and the spaces of the material into a heterotopia - a place "outside of all places," and removed from that which constructs it. [5]

Returning to Brancusi's studio for a moment we see that there are present at least three utopias – the artist's hand (as distinct from the artist's consciousness), the material studio (in this case both tools, materials and finished works) and the museum (acknowledged in the introduction by the handrail).

This collapsed space of action and event (with implicit inclusion of author and outcome) is the space long identified in artistic practices. In its many interpretations we see investigations and experiments of Ruskin's "truth to materials," [6] in modernist sculptural work (most obviously the work of Henry Moore and minimalists Eva Hesse and Richard Serra) and in the emergence of performance works in the 1960s and 70s in which "sculpture is re-contextualised within an action." [7] More recently, the work and strategies of practitioners like Tino Sehgal have become exemplars of a type of practice that synthesizes production and product.

It is perhaps not surprising that digital art practice with its distributed nature, obsession with the screen and contestable authenticity is less concerned with materiality "as being 'hyper,' 'virtual,' and 'cyber' –

that is, outside of the known materiality, existing independently of the usual material constraints and determinants [...]” [8]

However, in technologies such as rapid prototyping we can see practices emerging that exploit the notion of the digital as a material with its own 'material truth.'

In the collapsed space of the computation process that developed in this project, the 'material truth' is one that originates not in the artist's body, the tools of production or the physical materials but a heterotopian space that is distinct from all three – the space of the digitaterial. (It's important here to distinguish the Digitaterial from digitality. Negroponte's (1995) treatment of digitality separates the world into "bits and atoms" whereas the notion of digitaterial space collapses the physical and the digital into a common space in which the digital has materiality.)

Rather than visualizing the outcomes that might be produced, what must be conceived of is what the process itself delivers. Rather than imposing subject matter for technology to execute, the relationship between the artistic gesture and technology should be seen as subject matter itself in a manner that is part of the continuum of "truth to materials" in sculptural practice.

Traditionally additive manufacturing processes estrange the act of production from the act of generation as files are worked on in isolation from the material reality of the 3D printer. In fact this has been the goal of these technologies – not only to allow predefined designs to be realized as proto-types, remote from the tooling and mass production, but to remove the designer from the constraints of the materials and the preconception of form.

As Ann-Sophie Lenmann puts it: “New media have led to the formation of new creative spaces; spaces that seem to have caused a dislocation of materiality of the traditional working space.” [9]

Here we might identify both the promise and failure of not only additive manufacturing but, perhaps, our general approach to the digital. In liberating the artist from the constraints of the physical we define a media whose intrinsic materiality strives to go unrecognized or to pass as the real rather than the imitation of the real. “[...T]he very process of making is rendered invisible by the medium itself.” [10]

The digitaterial space is then defined as being the heterotopian space comprising and uniting artist, material and process – a space in which materiality and form are defined from within.

Ironically enough we find this endlessly thrown up to us in demonstrations of the marvel of 3D printing where the very tired Klein bottle is once again the standard. This impossible form – without boundary and in which notions of left and right remain illusive – has become the Escher of rapid prototyping as it exemplifies the dilemma of digital materiality.

This is the space of the impossibly perfect contour, the surface model that denies its own existence, as opposed to the space that has no form other than that which it itself defines.

The point I am making here is simple enough: that the digital, freed from representation, is not without material qualities. In and of itself it has characteristics that are as compelling as the block of wood or lump of clay in Brancusi's studio.

Yet to sculpt them, to form them, is akin to modeling air. In the most literal sense this is the experience of making these forms.

One's hands become disembodied. No longer the property of the artist they defer to the material of the digital that, as it twists, bends and rotates appears more in control of the artist's body than s/he is.

No longer calling to another site, this collapsed digital material now looks within to the locally defined gestural source for its sense of material truth.

The artist's actions are thus sublimated into the digital, his/her body controlled by the material logic of the medium. Rather than manipulating it s/he is party to it both inside and outside.

Slices of Time.

The sequential layering approach of conventional rapid prototyping systems imposes a structural logic on form that is alien to its own inherent structural logic. The computation of slices that provide the freedom to generate impossible Klein-like forms is one of the liberating attractions of 3D printing. Yet, even in structural terms it presents a weakness. Unlike a branch that's grain is indicative of its form, adding a strength to it that is an inseparable part of its materiality, the slice approach is externally defined.

Using the analogy to wood-grain we can conceive of a system in which the printer head follows the contour of a form, possessing its own material logic. However, this places further conceptual considerations before us.

Diegle's work on curved layer deposition follows this logic and looks to the form itself as the referent for its deposition structure. By analyzing the contour of a surface, layers can be deposited along the curvature of the shape, increasing the structural integrity of the build.

Instead of sequential layering's external slicing up of time, in curved layer deposition time exists relative to the form of the material. Form is not conceived of with a logic outside of its own generation; rather, the space and time of the form are "constructed locally." [11]

The imposition of an externally defined time based construction of form has the inevitable effect of producing a lag between generation and realization. Reducing or eliminating latency has been the ambition of many developments and experiments in digital media. Explorative investigation of direct manipulation such as those conducted by Willis et al, cite latency as a problem to be solved, as a temporary technical obstacle to achieving material immediacy. However, if time is seen as a material feature of the digital as discussed, then immediacy is inherently resolved. The goal of reducing latency in digital media processes is then a misguided attempt to make the digital 'real' – immediate in the here and now.

If, as suggested earlier, direct manipulation can be achieved by collapsing the space of the body and the space of the material, and that time is a dimension of the material instead of producer, then the imperative of reducing or eliminating latency between generation and deposition becomes obsolete. Instead of seeing latency as a technical/mechanical failing to be overcome, the gap between production and produced simply no longer exists.

The Workbench of the Digital.

Unlike Brancusi's studio the workbench of digital material is not a space cluttered with tools or littered with shavings any more than it is the SHIFT/CLICK/ZOOM of the mouse or the software interface. The digital material workbench is the disembodied space map of my hands as they reach out and dissolve in the Kinect's vision.

Perhaps instead of obsessing about making the digital 'real' by seeking to impose ever-greater control over its ability to be 'real' (or, more accurately, to conform to existing notions of the material real) we can approach an understanding of digital materiality by collapsing into the space that is "absolutely different from" that which defines and generates it. [3] The digital material is that which is released from our grasp as we embrace it.

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Stereo Animated Pictorial Space: Le Phénomène Atmosphérique

Ina Conradi Chavez

How can artists influence new technological initiatives and push the expressive capabilities of animation and 3D stereoscopy towards a new pictorial space? How can we create fully immersive paintings where large scale moving paint marks and textures would appear to exist in real space? Written at the starting point of this research, this paper will try to describe it, with emphasis on the first art works produced.

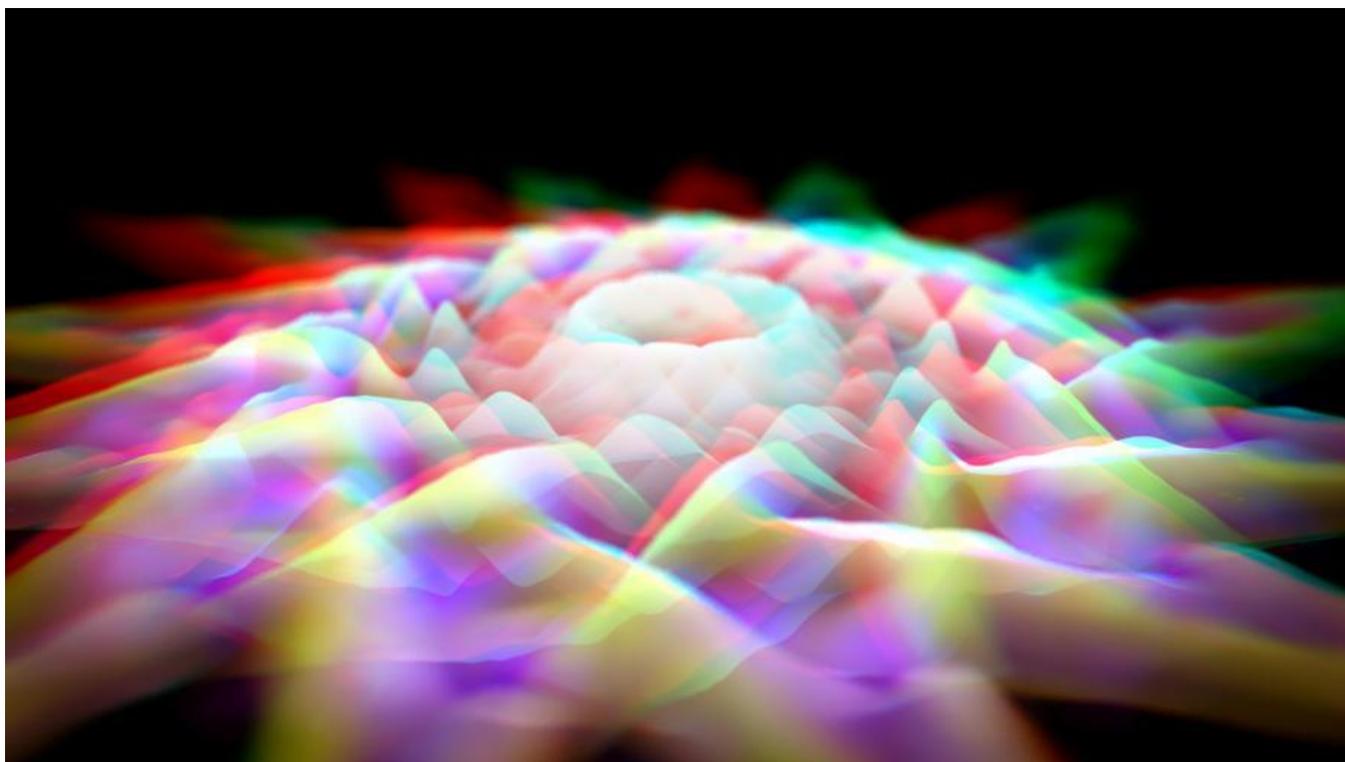


Fig.1. Le Phénomène Atmosphérique: Aurora, 2011, Ina Conradi and Yoon Wan Cheong Davier, Still from 3D stereo Digital Animation, © 2011 Ina Conradi. 3D red-cyan glasses are recommended to view this image correctly.



Fig.2 Le Phénomène Atmosphérique: Glories, 2011, by Ina Conradi and Yoon Wan Cheong Davier Still from 3D stereo Digital Animation, © 2011 Ina Conradi. 3Dred-cyan glasses are recommended to view this image correctly.

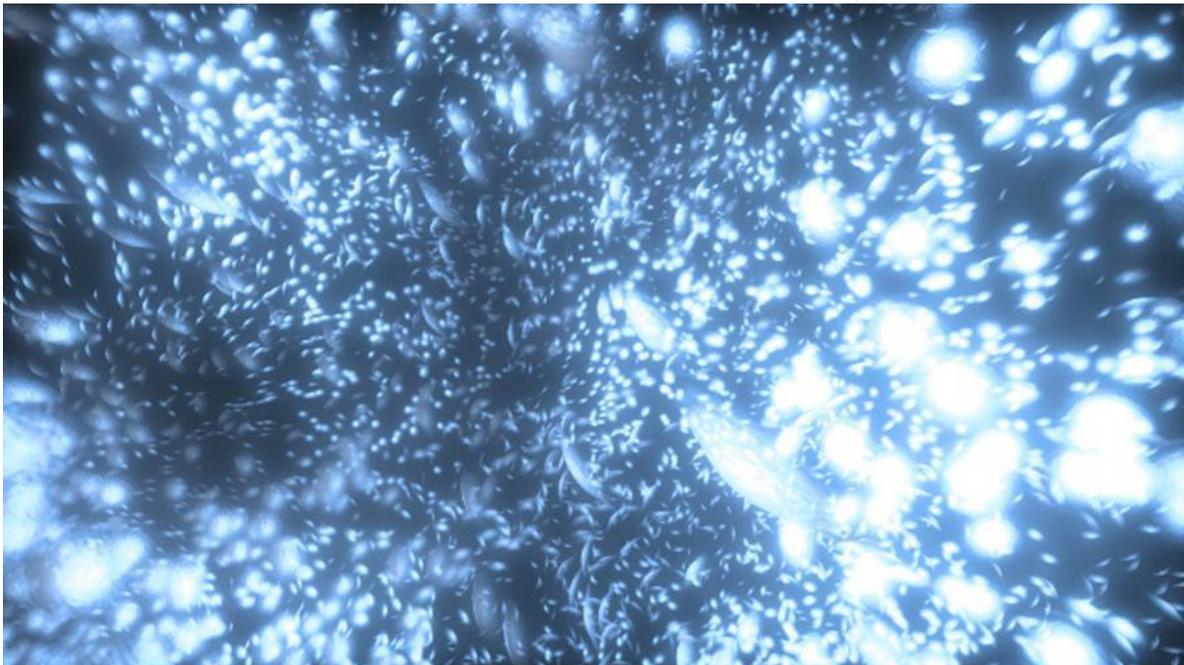


Fig.3. Le Phénomène Atmosphérique: Precipitation, 2011, by Ina Conradi and Yoon Wai Cheong Davier, Still from 3D stereo digital animation, © 2011 Ina Conradi.

Introduction

Recently started research within the Institute of Media Innovation, and continued as part of the Academic Research Fund (AcRF) TIER 1, at the School of Art, Design and Media, at the Nanyang Technological University, opened an original field of explorations into inventive applications of 3D stereoscopy and artistic digital media expression. This writing occupies a potentially contradictory place in relation to the actual art piece, an animated film *Le Phénomène Atmosphérique*, which will accompany the presentation of this paper at ISEA 2011 Istanbul.

In *Le Phénomène Atmosphérique*, the argument of the research project will be made visually. This experimental 3D stereo animated amalgam, with heightened senses of emotion and immersion, aims to create a pictorial experience that is dimensionally composed in virtual and real space. Sixteen short sequences of painted and animated atmospheric optical phenomena will be juxtaposed without a great deal of verbal explanation. However, here they appear as a reproduction, flat and printed as anaglyph composites. The print visual results in poor color fidelity as it is viewed with passive red/cyan glasses, but when experienced in person as a fusion of visuals, sound and movement, it is meant to reveal a quite different feeling. Moreover, a text will try to articulate the notion of painting as one that is based precisely on its resistance to language, and is fueled by the immediacy of a sensory enhanced illusion of depth; and therefore is expanding its pictorial space. The sole write up on stereo design methodology carries a risk of standing in opposition to the actual viewing experience. My feeling, however, is that, during the visual presentation, the two will stand as balanced complements. At the same time both the art works and the write up actively embrace the contradiction. On one side, there is the frustration to clearly define painting, and how it relates to the prolific chaos of popular digital image making methodologies; in particular, visual effects in cinema. On the other, continuing pleasure in painting and being so completely motivated by pictorial qualities, makes these works very close to the spirit and intention of twentieth century abstract painting practice. As American abstract painter, Ad Reinhardt put it: "If I were to say that I am making the last paintings, I do not mean that painting is dying. You go back to the beginning all the time anyway." [1]

'Cyclops Eye'

Roger Ferrgallo points to Charles Wheatstone's 1838 discovery of the psycho-optical consequences of our binocular vision of reality – where one sees that this reality is the product of our two spaced-out eyes, rendering two different retinal views of forms in the visual field, so called stereopsis – as a discovery that caused great excitement in the arts. To quote Ferrgallo's enthusiasm from his *Manifesto*:

Painting is reborn. Enter the new awareness of stereo space and a new aesthetics in painting. The century's long conquest of plastic forms within a monoscopic pictorial space may be at the end. A new powerful illusion of the three-dimensional space-field is possible. It asks nothing more than the trance-like stare of the middle eye to waken *Cyclops* from his 35,000-year sleep. This primeval giants reward will be the sudden revelation and witness to the dematerialization of the picture surface into an aesthetics of pure space where visible forms will materialize and release themselves—forms that are suspended, floating, hovering, poised, driving backward and forward, near enough to touch and far enough away to escape into the void. So now, enter a new aesthetic empathy, meditation, subjective intensity and an unparalleled form-space generation and communication. All of this exciting injunction could have been declared 134 years ago had it not been for the invention of photography. However, at that time, 1838,

the full investigation of form within the limits of the monoscopic surface had not yet been fully realized: the genius of Cezanne, Picasso, Braque, Duchamp, Balla, Mondrian, Kandinsky, Moholy-Nagy, Pollock, and Escher lay ahead. Awaiting the future, too, would be the subjection of the picture plane to the forces of sculpture. [2]

To what extent did the recent surge in 3D, stereo media inspire the desire to alter the viewer's experience of the painted surface? It was left to the advancements in visual effects and image manipulation to influence artists to definitively break with easel painting and to account finally and determinedly for the emergent binocular vision of 20th century abstraction. [3] The influence of cinema alone with the surprise and marvel at the magical trick of 3D stereo illusion is addictive, as the spectator wants to immerse oneself in the 'optical fantasies.' Paradoxically, when used in arts, 3D stereo technology generates complaints. [4] The inevitable threat of danger continues in crossing the boundaries between popular media and traditional painting media. Consequently, in the 21st century painting practice continues dancing in circles with technology, while the physical materiality of the still, flat canvas, and the magic of projected animated visuals are chasing each other's tail. [3] Anne McCauley, in her essay on *Realism and its De-tractors*, states:

The undeniable commercial success of stereoscopic views was met by charges that the stereo images appealed to the young and ignorant, enticed the masses with the objects beyond their means, undermined the taste for the ideal, and encouraged idleness. The contemplation of images, particularly those that seem to dissolve their mode of creation into the transparency of nature when it is confronted directly, has always been fraught with danger: the danger of confounding the icon with its unknowable referent, the danger of desiring things of the world, the danger of being fooled into thinking that the illusory is real. Yet, at the same time, the production of images that go further and further in recreating the effects of lived experience reveals how widespread is the public's willingness to succumb to phantoms, dreams, *simulacra*, where the body vaporizes into pure visuality and effortlessly travels in space and time. Nowhere can this conflict between the popular craving for visual thrills and the condemnation of such desires be better observed than in responses to stereographic arts – photography and moving image. [4]

McCauley illustrated popular beliefs that 3D stereo invention carried apocalyptic predictions of 'the end of creativity' for the traditional fine arts. Today, however, all practices can benefit from each other. The 'chaos of connections' in new media, science, and traditional painterly approaches could be used to gain advantages towards helping painting to expand into new space. [5]

Rebuilding Abstraction

Abstraction in painting is putting too much emphasis on the materiality of pigments and immediate random gestures. In fear of any figuration and illusionism, pictorial space is being reduced to a thin, shallow, and inert one; threatening to disappear all together. In addition, regardless of if it is figurative or non-figurative, the appearance of things in paintings has very little to do with the way one actually sees things and how they are represented on the surface. Moreover, it is nearly impossible to attempt to make things look in painting the way they look when one perceives or experiences them. 3D stereo space is a fragile illusion, however it is able to restore pictorial space, by converging not only the renaissance notion of measurable space, but also of the void and pure spaces of Malevich's white square; and of Irwin's experiences of the fourth dimension. There is a thrill to be given such an exciting opportunity to explore how stereo immersion can keep the concept of painting fresh. In fine arts, human perception plays a central role in establishing a channel between the artist and his audience over which emotions,

feelings and ideas may be communicated. Our intellectual experience complements spatially and formally, the optical phenomenon perceived by the eye and renders them into a comprehensible whole, while photographic cameras reproduces the purely optical picture.

In painting, some of the monocular depth cues (light and shade, relative size, interposition, textural gradient, aerial perspective, motion parallax, linear perspective) have been vastly exploited and exaggerated to compensate for the absence of binocular depth cues (binocular disparity and convergence). [6] Binocular depth cues are provided by the two retinal images perceived by our left and right eyes. In the presence of binocular depth cues, the human visual system is able to evaluate and appreciate depth information. [7]

When stereo pairs of images are created and presented to each eye, care must be taken to properly reproduce these cues; otherwise, the viewer will experience discomfort. The challenge is in creating the 'miracle balance' with proper use of interaxial separation. Interaxial separation and zero parallax settings are key to getting the desired stereo effect. Setting the right values is crucial as it could result in a good stereoscopy with convincing spatial depth or one that is painful to watch. Interaxial separation determines the distance between two cameras; in real world scale, it would be set to a value of 6.0 to 6.5 cm (2.4" to 2.6"), to simulate the average distance between the human eyes. In these experimental works, which do not simulate in a representational and realistic manner, the right value had to be generated via trial and error by preview. In this project, the preview was done using 3D 120Hz LCD technology with active shutter glasses, where composites of the left and right eye images are presented on alternating frames. Each eye is still seeing a full 60Hz signal equivalent to the refresh rate on the LCD monitor. From tests, it is apparent that the Interaxial Separation value is inversely proportional to the apparent size of the 3D object. A large value would make the object appear bigger and closer, while a smaller value would make the object appear smaller and farther.

Painting as emerging and expanding space

Le Phénomène Atmosphérique, is a 3D stereo animated film inspired by the works of Olafur Eliasson and his on-site constructions of nature, as well as the Light and Space Movement associated with figures such as Robert Irwin and James Turrell; and their works in Southern California during the 1960s and 1970s. *Le Phénomène Atmosphérique*, is not an homage to these works but rather an attempt to continue to elaborate on the possible role of heightened spatial displacement; and how we experience depth, space and color. It is continuing justification that any new and worthwhile development in painting must be founded by extending the 'working space' of painting into virtual space. In this case, the painting space is the one that will be integrating Stereo/3D animation and projection, motion and sound. The main motivation behind the featured artwork is to break away from two-dimensional easel painting and towards 'freedom of materiality' and 'pictorial expansiveness.' [3] The film made use of the Next Limit Technologies, Real Flow and Real Wave software, which create unique fluids and physical body dynamics for realistic water simulations in visual effects industries. The scenes were composed in 3D stereo to create a general feeling of atmospheric optical phenomena and weather formations such as airglow, aurora, clouds, precipitation, rain, and windstorm. To highlight the distinctive beauty and unpredictability when water and light work together, various caustics were generated. Almost every shot in this film has been derived directly or indirectly from a caustic image sequence. The visual effect is seen when light is reflected off a specular or reflective surface, or focused through a refractive surface, so that it indirectly illuminates other surfaces with focused light patterns. In 3D graphics, caustics are rendered as a type of global illumination, using raytracing techniques. The notion that we 'see' the precipitation, as a quietly turbulent atmospheric water phenomena, sometimes on the screen surface and

sometimes floating in front of it, leaves the space and voids surrounding the water vapor with an ambiguous but strangely compelling set of coordinates. The 3D volume illusion is only serving as an armature to support the image's crumbling materiality. What is learned in this film is that relying on 3D stereo alone to create new perceptual experience is not enough. Energy of created 3D volume and mass has to be accompanied with the proper handling of stereo composition, color, light, and rhythm. They are the main anchors for the lightweight atmosphere of shallow moving surfaces.

Utopians of the image

The suggestive phrase 'utopians of the image,' is used by Ray Zone, in his article on 3D stereography. He said that the discovery of stereography preceded the invention of photography as well as motion pictures:

In fact, the realism of the very first stereo view cards drove the invention of motion pictures. These inventors looked through the stereoscopes and saw a 3D image, and asked themselves, 'What's missing?' Well, motion was missing, so as utopians of the image, they set out to add not just motion, but sound, and color, and depth.[8]

The artist painters and filmmakers are continuing to create experiences that are not simply mimicking reality. In fact, they are embracing the ways that works of art are different from reality. [9] In today's hybrid mixed media artworks, depth is still a very powerful perception tool. To arrive at "the painting which shall not be distinguished in the mind from the object itself," [10] is becoming easier with the improvement in 3D stereo, where forms can be made to exist synthetically in a binocular space; a field that is itself consonant with reality. For this research, the focus will remain on providing a means for resurgence in dynamic painting practices through beauty, vision and sensibility of innovative stereo animated content, but at the same time initiate a potential of new developments in 3D stereo technologies. Drawing on the ideas of recent technological initiatives in S3D technologies and the renaissance in stereoscopic cinema, this project is an exciting opportunity to continue to explore the innovative convergence of art and technology.

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《Super Will> Super Share》

Yueh Hsiu Giffen Cheng

《Super Will>Super Share》 does not focus on the result from the traditional prediction, but the phenomenon of the combination of folk couture and digital culture, particularly how people's behavior have changed throughout the hi-tech era. Hence, when people visit 《Super Will> Super Share》 , they are experiencing a combinational culture between traditional and digital media, a contribution for collaborative creation.



Interactive installation of "Super Will>Super Share", photo by Yueh Hsiu Giffen Cheng.

《Super Will>Super Share》 does not focus on the result from the traditional prediction, but the phenomenon of the combination of folk couture and digital culture, particularly how people's behavior have changed throughout the hi-tech era. Hence, when people visit 《Super Will> Super Share》 , they are experiencing a combinational culture between traditional and digital media, a contribution for collaborative creation. 《Super Will>Super Share》 presents a phenomenon of recombination and decentralization from Post- Deconstruction.

The concept of 《Super Will>Super Share》 is based on an idea of the ancient Chinese folk ritual called Villain Hitting, with a purpose of connecting both elements, the conflict and the opposing, the virtuality and the entity, the digital technology and the traditional cultural phenomenon. The hi-tech age has brought us a digital space where full of imagination and over the rule from the nature; it has enhanced artist's creativity, especially for artist who uses computer as creative medium or platform. As for Villain Hitting, it is a kind of old ritual or behavior of the

mankind since ancient time, and still existing and continuing at the present days in the modern society. Thus, the hi-tech and the tradition have formed a contradictive social phenomenon. 《Super Will>Super Share》 does not focus on the result from the traditional prediction, but the phenomenon of the combination of folk couture and digital culture, particularly how people's behavior have changed throughout the hi-tech era. Hence, when people visit 《Super Will>Super Share》, they are experiencing a combinational culture between traditional and digital media, a contribution for collaborative creation. 《Super Will>Super Share》 presents a phenomenon of recombination and decentralization from Post- Deconstruction.

Villain hitting, is a folk [sorcery](#), popular in the [Guangdong](#) area of [China](#) including [Hong Kong](#). Its purpose is to curse one's enemies using magic. Villain hitting is often considered a humble career, and the ceremony is often performed by older ladies. The period for villain hitting is different among temples, but Jingzhe is the most popular date. According to some folklore, Jingzhe is the date when the whole of creation is awakened by thunder. As a result, different kinds of foul spirits including byakko and villains become active.

The concept of "villain" is divided into two types: specific villain and general villain. Specific villains are individuals cursed by the villain hitter due to the hatred of their enemies who employ the hitter. A villain could be a famous person hated by the public such as a politician or could be an enemy known personally, such as when the request is to curse a love rival. Villain hitters may help their clients curse a general villain: a group of people potentially harmful to the clients. [DUALISM](#) is a mainstream in the traditional Chinese [world view](#), and many different kinds of folk sorcery beliefs derived from this view. The concept of Villain and Gui Ren (people who will do something good to the clients) developed as a result of this [yin and yang](#) world view.

In Hong Kong, Villain hitting does not only perform on the day of [Jingzhe](#), every time when people encounter difficulties from job, investment, health, love, gambling, or any kind of problems from their life, people will go for Villain hitting service- to hit the bad luck out from their Fortune, in order to pray for blessings and help from Gui Ren (people who will do something good to the clients). Although Villain hitting seems a superstitious behavior, it applies to a form of Psychology theory. The Time magazine has detailed the story of Villain hitting last April, and commented that, Villain hitting is a kind of spiritual therapy, which is beneficial for mankind.

On September 15, 2008, when the Lehman Brothers Holdings declared bankruptcy, the whole global stock market was affected by it and went down in the twinkling of an eye. Predictions from stock experts were malfunctioned, precise formulas for stock analysis had failed to operate. Thus, people started approaching a traditional way to comfort their souls, in an attempt to find a faith from the traditional folk culture which has disappeared in the hi-tech era. The idea of 《Super Will>Super Share》 is to convert the ritual of Villain hitting into a game-based artistic project, and transform the traditional culture into a digital technology platform. It shows the value of folk culture in the hi-tech age, and the social status between its close but estranged relationship.

《Super Will>Super Share》 is a collaborative creation project based on the ritual of Villain hitting, using Taiwan's stock market index as its data, allowing investors to imitate the ritual of Villain hitting, in order to strengthen people's collective wills, and to make their favor shares increase. Therefore, the stock market index in the 《Super Will>Super Share》 presented a virtual data from its participants' collective contributions. With more participants doing Villain hitting on the same share, the higher index the share will be. Consequently, when people are participating in the 《Super Will>Super Share》 project, they are also experiencing the collaborative creation at the same time. Hence, there is a metaphor to draw support from the combination of tradition digital hi-tech in a progressive tense of society.

Operation introduction for 《Super Will>Super Share》 :

1. Key in 2 sentences as your wish context into the computer system.
2. Select 1 share from the listing data, which is the one that you wish it will go up.
3. Concentrated on hitting the share from the projected image through a physical hammer.
4. A sensor of dynamometer is built inside the hammer, it transfers the strength of each hit by the participants into a digit, and responding with the appropriate format of data to a graphic pattern.
5. The pattern appears on the projected image represents a virtual value of the stock share, which accumulated from every participant's strength of hitting the stock share at the first step.

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INVISIBLE PERFORMANCE IN THE CONTROL ROOM: THE RESONANCE BETWEEN THE PERFORMANCE AND THE TECHNICAL PARTICIPANT

Suk Chon & Joonsung Yoon

Recently, media technologies pervade stages for performing arts. It is also a very interesting phenomenon as itself. Just as the independence of the musical from the opera, those cases might be a precursor for the birth of a new performance. In the timing of these changes, new requirements are needed as new roles, we believe.



Technical Rehearsal of Sympathy (PANSORI & SAMULNORI), 2010, Suk Seon An & Duck Su Kim / group PERFORMATIVE, performance media, Copyright group PERFORMATIVE.

INTRODUCTION

In ISEA2009, the creative group, PERFORMATIVE has presented the performance combining dance and technology. Major topic was the real-time connectivity between dancers and visual images. In ISEA 2011, we would like to introduce the inter-relationship between the performance and the action of inspired people by the performance. In September 12th, 2010, Korean maestro in the traditional performance, Duksoo Kim played 'Samul nori' with the creative group, PERFORMATIVE which accomplished technological parts. There were two stages. One is an ensemble of big and small drums. The other is variations of 4 different types of percussion instruments. We used an interactive real-time visualization system generated by the rhythm of percussion instruments in the performance.

KOREAN TRADITIONAL PERFORMANCE 'SAMUL NORI'

Korean traditional performance, 'Samul Nori' is composed of four percussion instruments, 'Kkwaengg-wari (a small gong, the role of thunder),' 'Jing (a larger gong, the role of wind),' 'Janggu (an hourglass-shaped drum, the role of rain)' and 'Buk (a barrel drum similar to the bass drum, the role of cloud)'. Its

root is farmers' music which is a Korean folk genre comprising music, acrobatics, folk dance, and rituals. This performance is characterized by strong, accented rhythms, vibrant body movements and an energetic spirit. It is an improvisational performance using patterns of ancient rhythms, and the audiences will feel the 'Shin Myoung' which means a combination of enjoyment and commitment in Korean. This condition is similar to the possession of a spirit in the ancient ritual.

TECHNICAL ISSUE

Our technological issue was to produce live images according to the sound of performance. Originally, we wanted to use various input sound factors like pitch, melody and rage in the system. During the simulation, we, however, found out that too many input factors made too tacky results. Therefore, we chose the rhythm only, which makes the most dramatic result as the major factor. Then, it was possible to analyze real-time sound of performance. We unpacked various sounds of instruments through the FFT (Fast Fourier Transform), and could assort the dynamics of whole sounds.

Finally, we generated images and visual effects on the stage with Flash program through those input data. And, we programmed that the volume and the speed of the performing piece could affect the size and the visual effect of the image. Besides, we added real-time operation function which could make more various images for the performance. Fortunately, this change was more effective in the performance than the original plan.

UNEXPECTED RESULT

At the performance, the most interesting situation has occurred in the control room. During the performance, the visual operator was immersed in the rhythm of percussion instruments. And he began to manipulate the operating system in improvisation without his cognizance. This inspired control was highly synchronized and conformed to the performance. The Operator was getting into the percussion's rhythm and controlling the system at the same time. He created interesting and colorful images than the existing plan. It was unexpected result at the rehearsal.

At the rehearsal, every control and operation was planned for the corresponding director's instruction, because it was needed to check the technical system and to direct the script in a short time. But the performance began, those tensions gradually disappeared. And the visual operator was excited and inspired, that is, he was in 'Shin Myoung.' He manipulated the keyboard and the mouse powerfully and dramatically as if he played a big drum on the stage. When he heard the resonance in a big drum, he was transmitting more dynamic images.

As a result, the accidental link was able to express the feature of music just like the originally planned one. The visual operator's response and action were very considerable and interesting, while these actions occurred in the place that the audience could not see. Even though the performance is for a performance on the stage, we would note that the operator's inspired control provokes and produces another invisible performance at the back stage. 'Shin Myoung' has worked for the audience and the supporting group members as well.

RESONANCE OF 'SIN MYOUNG'

The resonance of 'Shin Myoung' would be embedded in the cold and logical area of control room too, and we need to reconsider the relationships between the artwork and the audience, and the artwork and its technical staffs in terms of the performer. We need to expand the concept of performer in performing arts at this moment, and to include players in the backstage. The inclusion can be explained by its traditional in-the-show and after-show event. At the Korean traditional performing arts, the audience usually does not stay calm, but provides and interrupt the performance by spitting out admiration or exclamation, that is, 'Chuim-se.' Also, there is a ceremony altogether with the audience and the performer after the official performance. They call it, 'Dwit-pul-yi.' Intermingling with performers, audiences jump into the stage and freely dance and singing together. In the traditional attitude, the whole inclusion has been done for a long time. These two traditional forms have usually been meant the viable communication of a performance and its response. If we dare extend the meaning in terms of the inclusion, it might be a sharing of dynamics and emotions.

CONCLUSION

Recently, media technologies pervade stages for performing arts. It is also a very interesting phenomenon as itself. Just as the independence of the musical from the opera, those cases might be a precursor for the birth of a new performance. In the timing of these changes, new requirements are needed as new roles, we believe. After our performance, our focus on a performer on the stage has transformed into the technical controller. These participating staffs do not simply control automated technologies. They are participating in the performance by involving directly in real-time performance, and their responses are based on high and deep empathy. Under these circumstances, how should we consider these active participants rather than simply supporting staffs?

They should not be considered as just technical staffs, but a part of the performance. In particular, if we apply forms and attitudes in the Korean traditional performance, there might be a juxtaposition of sharing and embracing aspects for the whole inclusion. The utilization of media technology in performing arts will be expanded gradually. Fortunately, media technologies have a distinct characteristic of interactivity, which might be applied to performing arts. The interaction is limited to a system and the performer so far. What we have to research furthermore would be the interaction among the performance, the audience and the supporting members beyond between the performance and the performer.

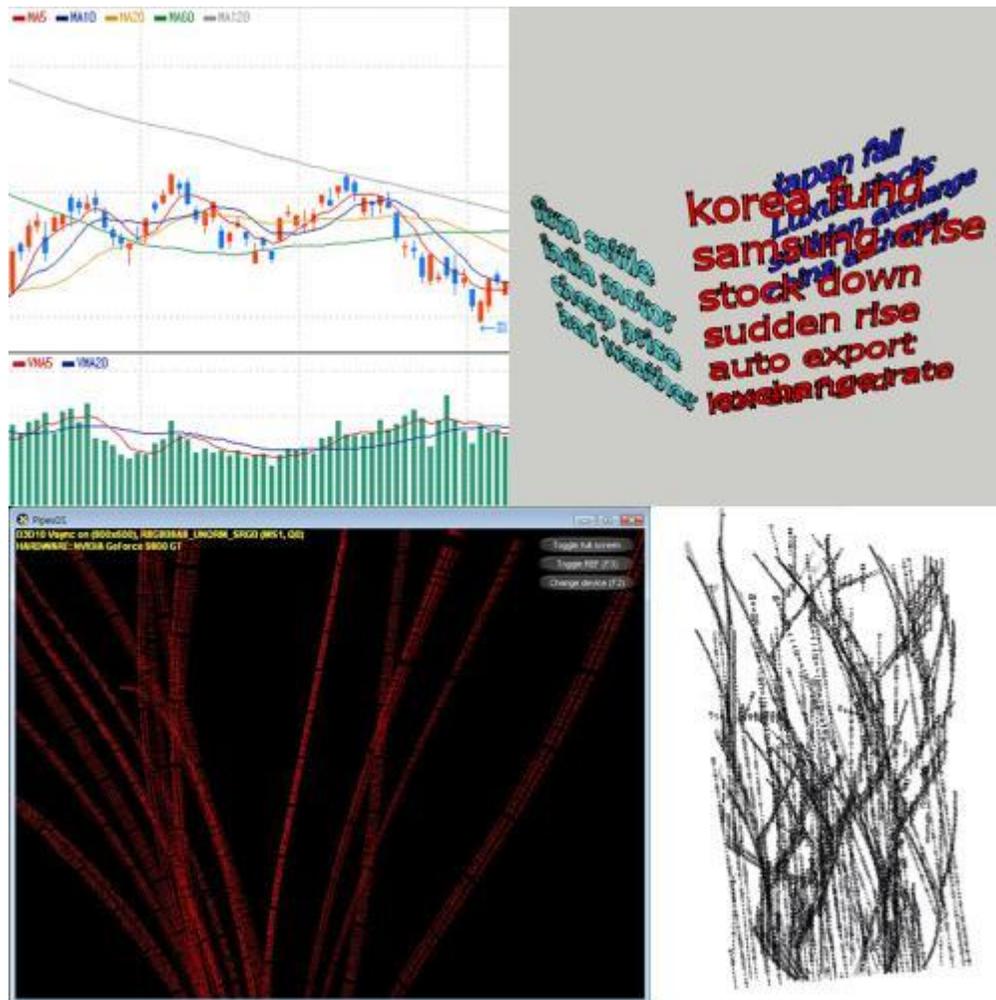
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DIFFERENT POINT OF VIEW ON THE COPYRIGHT OF ARTWORK BETWEEN ARTIST AND ENGINEER

Suk Chon, Bang Jae-Won, Hohyun Lee & Joonsung Yoon

Recently, collaboration between the artists and engineers is very common in new media art project, and they may think differently on the ownership and right of the produced work. I think general interpretation of the copyright may not solve this complex problem. Therefore, I'd like to propose that we should understand the situation and think of the best alternative measures on this issue.



Development Process: Information Visualization Project 'Contingent Rule (type stocks v0.1)', 2009, Artist MIOON / Coworker PERFORMATIVE, Real-time Interactive Video Installation, Copyright PERFORMATIVE

INTRODUCTION

I have been working in PERFORMATIVE, an art group, with people from various fields in liberal art, science and art. It makes art works based on digital technology. As an engineer, I have been taking

charge of technical part when creating art works in collaboration with performers, video artists, and fine artists.

In 2009 summer, our group created collaborative project about information visualization with artist. The main method of the project was displaying images and movie clips on the screen through analyzing data of stock market. From the first phase, there were a lot of discussion among researchers, artists and engineers. Through this way, we created great effect based on difficult skills like data crawling and mining. And we self-developed 'Shader Code' for visualization. By the combination of images and techniques, the project succeeded in creating artwork.

It is a very interesting process to create art works by discussing with artists and using various technological issues. However, it is not that a simple matter to determine who has the copyright of produced works. So began a complex problem.

PROBLEM DEFINITION

The first conflict occurred in the third exhibition. The artists promoted project for another exhibition, which was is very similar with 'the project' in concept and technical element. PERFORMATIVE raised about this problem but was not accepted. The artists insisted their ownership of the new artwork's copyright because it is completely 'new' piece produced with other engineer. On the other hand, PERFORMATIVE asserted both sides have the copyright for the collaboration from the beginning. In fact, the new artwork was also technically the same structure.

Actually, this kind of problem does arise in Korea. 'Does an engineer lose his/her right on the art work produced with the artists collaboratively if the work is reproduced with another engineer?' or 'Does an artist lose his/her right of the art work if an engineer changes images with same technology they created?' We think it was the wrong approach.

As collaboration between the artists and engineers is becoming more common in these days, they may have the different view of this problem. The collaboration between different fields will be increased in the future, and the right of the work will also be a very important issue. However, the existing interpretation of the copyright law may not enough for collaborated art works. We need to think of the alternative measure on this issue is.

THE RIGHT OF ART PROJECT

The Copyright take effect when the contents are created. The copyright could exist on incomplete one, if it has special artistic value or attributes of cultural heritage. Copyright is formed without any procedure. It is not an adjective law like a patent, a utility model and trademark rights.

Korean law sets copyright of artwork is painting, calligraphy, sculpture, crafts and applied fine arts. This is declaratory rule. So, even if we don't have said above, originative artwork is protected by copyright law. There are two rights for protection through the copyright of artwork in Korea. One is property rights for economic income. The other is the rights of ownership for honor of artist. All things considered, the artists were infringing on the copyright protection. And they ignored PERFORMATIVE's

contribution of collaborative project. Even they violated integrity right protected by using same contents, methods and titles.

There are two solutions about infringement of copyright. First, we can charge them with a crime. Second, we can request to control at system for copyright dispute. The copyright committee mediates arguments to agreement or compromise. By the way, indeed these legal elements in the digital age could protect properly the rights of creators? Moreover, if the work that created through the collaboration of many people is more difficult to protect.

Many people are creating wonderful, interesting and interactive works with various digital elements and technology. Digital process easily can be converted into an anything as someone expected. So, it is easy to reproduce art work if someone put their mind to it. Therefore, this problem which is reproduced the program on same art works or changed images on same program often appear in Korea.

OPEN SOURCE

Noticeable cases occur in Computing Science. 'Open source' have been performed to protect copyright and expand the software in Computing Science. 'Open source' is the project which open the source code corresponding to design of the software for the public free. So, anyone is able to redistribute and improve it. If you know the code, you can create something similar to it or change it as you wish. The Authoring tool like as 'Processing' or 'VVVV' is commonly used in media art work because they created based on 'Open source' concept.

Many artists and engineers create wonderful works using them. However, it is hard to say the 'open source' concept is completely fit for media artworks because it is for effective software development. On the other hand, creating artworks is expression of individuality and creativity. So, indiscriminate sharing and openness can damage an artist's identity.

ALTERNATIVE MEASURES

I suggest, with caution, that we should introduce 'CCL (Creative Commons License)' for guarantee that rights of creator. In the near future, we need the specific standards for role and rights between engineers and artists for media artwork dealing. It may similar with standardization in technology industry filed.

'Creative Commons (CC)' is the concept that your creation make to the common heritage of human beings through the self sign of sharing. Of course, CC is carried out only by creators' free will. Therefore, if you don't want to share your work or it created sponsored by commercials, CC doesn't insist unconditional openness and sharing. It makes an effort to support creators and introduce many creations to people.

Artist and engineer who create art works in collaboration publish each works and combined artworks using CCL. Copyright laws place restrictions on the publication and use of another person's creative work, while CCL could make you use it freely as you follow some terms which creators set up.

CONCLUSION

We need the first step for creating more specific standards and lower disharmony. CCL could be the alternative measure that is more collaborative and open than Copyright law as a tool to resolve disputes. It will lead to cooperate with artists and engineers.

Through attempt of CCL application, we could settle an open paradigm with them together. When they overcome the difference of view and practice creation and sharing, we could make more abundant and healthier media art. Furthermore, the collaboration of art project to become more actively and smoothly.

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VIRTUAL INSTRUMENTALITY : EXPLORING EMBODIMENT IN ARTISTIC INSTALLATIONS

Maria Christou, Olivier Tache, Annie Luciani & Daniel Barteley

In this paper we study the question of interaction with digital technologies by exploring the cognitive mechanisms of embodiment in the context of multisensory artistic installations. In order to test our hypothesis we observed visits to an experimental installation, which provides conceptual and technological consistency. Our first observations suggest that these conditions result in a strong embodiment for the proposed interactions.

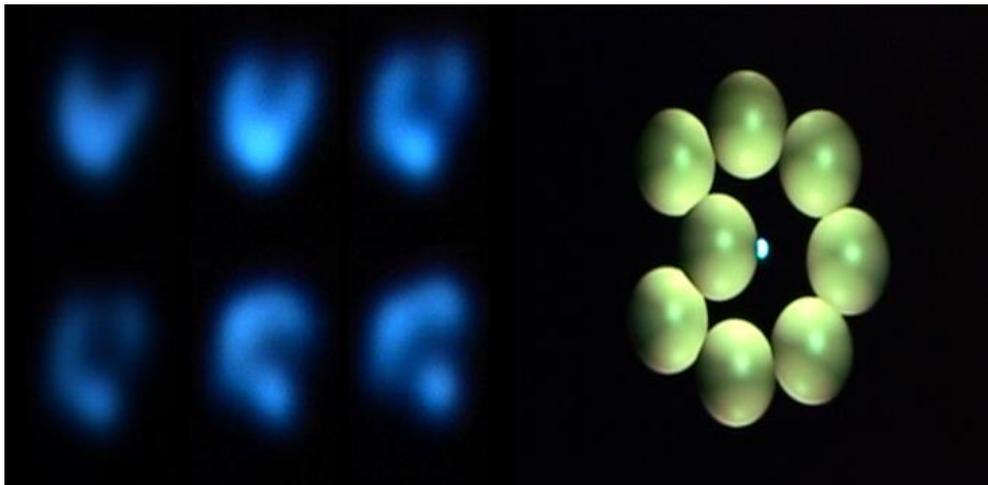


Fig. 1. The two visualisations: On the left a sequence of the "blurry"; and on the right the "ball-like".



Version	1	2	3	4	5	6
Contacts	Hard	Soft	Hard	Soft	Hard	Hard
Visualization	No	No	Blurry	Blurry	Ball-like	Ball-like
Force feedback	Yes	Yes	Yes	Yes	No	Yes

Fig. 2. Upper side: Coordinator and visitor while exploring the installation. Lower side: Summary table of the experimental sessions.

Introduction

Digital technologies for creation free us from physical constraints, but at the same time might lead to the loss of instrumentality, that is the very specific, rich and nearly intimate physical relationship between a human being and an object used to perform actions on the environment. [1] Yet the computer, programmed according to certain rules and linked to the man by the appropriate interface, may offer new forms of instrumentality and be considered as the locus of all instrumentalities. [2] We study the cognitive mechanisms of instrumentality in the context of multisensory art installations, inspired by the hypothesis that conceptual and technological consistency of the composing elements of a multisensory virtual environment is important to the instrumentality of the experience, which should result in a strong embodiment of the proposed interfaces and interactions.

Enacting Digital Matter is an art installation based on the simulation of virtual scenes, addressing the visual, auditory and haptic senses; proposing a form of virtual instrumentality based on physical modeling and force-feedback interfaces. It was presented at the European School of Visual Arts (Poitiers, France) in February 2010. Through this installation, most visitors experienced for the first time a multisensory interaction with physically consistent virtual objects; i.e. simulated objects that behave according to Newton's laws of motion. However, the visitors were presented with sensory paradoxes and unusual situations, such as the possibility to discover an object only by touch, or together with a visual representation apparently conflicting with haptic sensations. Thus, visitors were lead to experience aesthetic and emotional 'shocks' and to question their senses, which is the opportunity to collect essential information about the way our sensory-cognitive system works in an artistic multisensory situation. The installation was designed to capture these unique moments, allowing for further analysis in search of evidences of embodiment.

The Installation

Experiencing the virtual scenes, as well as the consequent commentaries of the visitors, were part of the installation, which was more a performance than a material setup. The aesthetic objects considered were not the force-feedback device, the simulated scenes, nor the resulting sounds and images, but the moments of discovery, exploration and expression by the visitor.

The installation consisted of two simulation stations, each one equipped with a screen, a loudspeaker and an Ergon_X force-feedback interface from Ergos Technologies, which allowed visitors to interact with the virtual scenes through hand and arm gestures. Each scene was based on a physical model created and simulated with the CORDIS-ANIMA system. [3] The sensory consistency of the installation was ensured by the fact that a single physical model produced the audio, visual and haptic signals through a synchronous simulation engine. Each station was also equipped with two video cameras and microphones, so that every visit could be recorded in good conditions for further analysis. This equipment was visible and each visitor was asked to give his or her permission to be filmed and recorded. At the entrance of the installation, a monitor screen displayed what was going on inside through one of the installed cameras.

The Model

Each visitor was offered the possibility to explore one or two scenes among the three available ones: “Pebble Box,” “Friction” and “Approach and Retract.” Each scene corresponded to six different versions that were presented successively. For a given scene, the six versions were based on the same physical model but differed by the presence or absence of one of the sensory channels and by the visual representation. For example, a scene could be presented only with visual feedback in one version (no sound nor force feedback) and with all three sensory channels in another one. In the following, the time spent by a visitor on one version will be called a ‘session.’

In this article, we will focus on the Pebble Box scene. [4] The underlying physical model is composed of eight circular masses enclosed in a flat, circular area (see Fig. 1). Using a force-feedback joystick, the visitor directly moves another, smaller mass in the box. Force feedback gives a haptic feeling of the scene: through his or her hands, the visitor can feel the contact between the manipulated masses and the other ones or the border of the box. The interaction between the masses, including the one manipulated by the visitor, is an elastic collision, whose stiffness is high for some versions of the scene and very low for others, giving respectively hard and soft contacts between the masses. Two visualizations were proposed: a ‘blurry’ one, which gives the impression of a nearly continuous medium, and a ‘ball-like’ one, which represents the masses and the limits of the box in a clear, non-ambiguous way. The table on the lower side of Fig. 2 summarizes the different parameters of each version. The order of presentation was the same for all visitors, from version 1 to version 6.

The Pebble Box scene did not have audio output. However, the motors of the Ergon_X interface emit sounds – particularly during hard collisions – which some visitors have remarked on and interpreted (see Results).

Methodology

Realism is well known to be a factor of embodiment and immersion, so it could have interfered with the other factors we wanted to observe through the installation; i.e. the consistency of the sensory sensations and the presence of haptic feedback. Consequently, we gave simple and quite abstract visual representations to the scenes. Visual abstractness was also intended to help the evocation process since no straightforward interpretation of the scenes is given. In the same perspective, the experience proposed to the visitors didn’t include any scenario, so as to focus them on the interaction with the simulated objects.

As mentioned previously, the installation explicitly included the fact that visitors could express the sensations and feelings elicited by their interaction with the virtual scenes. To stimulate expression, a coordinator accompanied the visitor in order to facilitate his or her reactions, through an open interview addressing; (1) the felt sense of the experience, (2) how it was felt, and (3) what it felt like. The coordinator encouraged the visitors to go beyond superficial descriptions and comments about what they liked or disliked in the situation. He or she helped them talk about their haptic sensations, which is known to be difficult for many people. The scenes were not presented as being a representation of any existing situation: they were only designated through numbers (e.g. “Scene 1”) and the coordinators did not make any suggestions that could lead the visitor to a particular interpretation. As a consequence, the resulting subjective descriptions were expected to access deeper levels of consciousness related to the felt experience, for example through ‘forgotten’ memories or evocative thoughts.

Six visits to the Pebble Box scene have been recorded (see Fig. 2). The visitors were all men, aged from 20 to 55 years old, most of them having an artistic background. We will refer to them with an arbitrary number (e.g. “Visitor 1”), which is not related to the order in which they visited the installation. The visits lasted approximately one hour.

Results

We focus here on three main observations that suggest the connection between consistent sensory signals and embodiment, or, in other words, what we call virtual instrumentality. Instrumentality in the virtual world is the result of an embodied interaction, which enables the human capabilities to incorporate the new situation. The instrument becomes an extension of the hand, and can be used fluidly and intuitively to explore the given possibilities of the virtual world. In the Pebble Box scene, the instrument considered is a hybrid system constituted of the force-feedback device (real-world part) and the simulated mass that is connected to it (virtual part). The structure of the process towards instrumentality is here explored in three constituents:

EMBODIED MEMORIES

In order to explain the newly felt sensations, visitors were suggested to employ a strategy of transposing them to another experience, felt in the past. The experiences they chose in order to describe their sensations were characterized by a strong embodied quality. They were about sensations from their daily routine, or deep-anchored senses of their past. These felt memories came to explain the actual haptic situation.

Here is how Visitor 1 describes his sensations when exploring the scene in the first session (no visualization, hard contacts):

The images that come to my mind are situations where, sometimes, I wake up in the morning, on my bedside table, there is a glass of tea, my glasses, stacked books, the alarm clock, handkerchief packs, and things like that, and I try to catch my glasses to check what time it is and so I grope around saying to myself ‘I’m going to try not to knock anything over...’ and then suddenly you put your eyes at your fingertips.

During the first session too, Visitor 2 explains that the haptic sensation he experiences is actually familiar and he can remember it from another situation: “I know from experience, I’ve done this before, I can remember that sensation... when I was riding a bike, the friction of the brake on the front wheel.”

SPATIAL REPRESENTATIONS THROUGH HAPTIC FEEDBACK

The sensation of a space, opening up at the haptic sense, has been described during most sessions and by most visitors. For example, during the first session, even though there is no visualization, Visitor 3 said:

I think there are still constraints, that is to say... places, places... For example I have the impression that I feel a kind of ball, a kind of place where I am below. [...] I’m navigating around a space, into a space [...]

there are empty places, there are full and empty spaces... Well, I really see it as a plane, [A/N: a flat surface] it's on a plane.

The description of the virtual space gained in subtleness during the third session, when a visualization of the scene, the blurry one, is given for the first time. It became instantly clear for all participants that the image was the graphic representation of the virtual space they had explored haptically. Visitor 3 declared: "Yes, this is the graphical representation of this space!"

Visitor 3, recognized the image as a graphical representation while continuing to manipulate the haptic device. The connection between gesture and graphics came as the result of doing. An image coming as a verification of the haptic sense has also been discussed in the paper of David Prytherch and Bob Jerrard. [5]

In addition to that, Visitor 2 describes how he was able to refine the characteristics of this space: "I think there are several stages with the joystick. All around, well... there is nothing acting. Then, there is a resistance appearing around, when moving towards the center of the joystick, there is a resistance that comes in."

Visitor 3 also described with more details the virtual space: "It's as if there was a ... a circular constraint, in the center, a ring, and I can go either outside or inside it. Now I'm in the inner ring, and if I force a bit I move to the outer ring."

During the fourth session (blurry visualization, soft objects), visitors talked about sensing a curved space, a feeling that can be due to the succession of repulsion and contraction forces. Here is what Visitor 4 said: "I have a space which is rather curved. A haptic space."

During the sixth session (ball-like visualization, rigid objects), all of the participants talked about how the virtual space they felt before was finally revealed to them. They were able to identify the haptic sensations they experienced during the previous sessions and felt the connection between the mental representation of the space they had constructed and the visual space presented to them during this final session. Visitor 3 expresses this connection between the visual and haptic channels in a particularly strong manner: "There, this is what I wanted from the start!"

This quotation suggests that the mental representation of the scene elicited by the haptic channel was strong enough to call for a specific visualization, which corresponds to the ball-like one. Notice also how most of the visitors use first person expressions to describe the sensations. This point is really important to us because it indicates clearly an effective implication and immersion into the virtual scene. It seems that visitors were projecting themselves in the scene through the instrument instead of considering it as an intermediate between them: the instrument was, at least partially, incorporated. This tendency was probably reinforced by the fact that they didn't clearly see what they were actually manipulating until the fifth session.

All these remarks indicate that it is possible to create a strong representation of the virtual space with haptic sensations as the main input. However, during the second (no visualization, soft contacts) and fifth (ball-like visualization, hard contacts, no haptic feedback) sessions, it is really remarkable that none of the visitors talked about space. On the contrary, when strong force feedback was there, the feeling of touching the space was present, and even augmented by visual representations of the scene.

THE MACHINE EMBODIES AN INDEPENDENT LIVING AGENT

The haptic device of the installation takes on a life of its own, it becomes an autonomous entity, with its own will and personality. The visitors interpret its feedback and reaction as well as the mechanic sounds, as a dialog between them and the machine. They ascribed mystic ways to its performance.

“She [A/N: the machine] doesn’t want me to reach the central position.”

“When I pivot, I feel that it kind of stands up to me.”

“I like the sound of the machine... you know... its way of conversing too [...] I don’t know if it’s a dialog... Well yes it is, it’s a dialog [...] if we say that this is a reactive entity, maybe a living entity, I don’t know, it’s... this movement to make it feel good, or bad... according to its reaction.”

We observed differences in the degree people experienced it in different situations. On one hand, in the first session, the machine’s reaction was perceived as stubbornness, as a resistance to the visitor’s intention to manipulate it.

On the other hand, in the third situation, visitors softened their expression and tended to interpret the machine’s reaction more as a way of communication between them and the image, an agent who reacts to their gestures. In both cases the haptic feedback was the same, what changed is that in the first situation the only sensory feedback came from the haptic device, and in the second there was an image which reacted correspondingly to their gestures. So, a second sensory feedback cue helps in the understanding of the interaction. People were no longer confronting the machine, but rather cooperating with it.

“Anytime I move, it’s full of tiny different sounds, as if it was a language.” (Visitor 2)

“Actually, it’s a response to the gesture I make.” (Visitor 2, talking about what happens on the screen)

“Without the image, well it’s true that I feel something but, there, on the screen, I’m conscious that there is something facing me.” (Visitor 6)

“What is curious is that, suddenly, I feel like there is someone else who wasn’t there [...] Until now, I had the feeling that I was in a kind of dialog and now... now we are three.” (Visitor 1)

Finally, in the forth session (blurry visualization, soft contacts), the feeling of being in a dialog persists but this time the entity is considered less reactive:

“I think it was given some anesthetic.” (Visitor 3)

Conclusions

Our method has proved to be a valuable way to collect rich information about the visitors’ experience, providing insights into the sensory-cognitive process. We identified three dimensions that characterize creative interaction with the virtual scene depending on the degree of multisensoriality. Enactive situa-

tions awake embodied memories in order to create the adequate conditions to translate the virtual experience to an embodied one. Developing haptic feedback enables spatial representations of the virtual world and subsequently helps in building a better coupling of action-interaction, a necessary condition for creative interaction. Finally, the fact that we recognize the machine as an equal co-player by attributing it agency couldn't conclude better our hypothesis for creative instrumentality in virtual artistic environments.

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All quotations in the paper were translated from French by the authors.

ACKNOWLEDGMENTS

This work has been supported by French National Agency of Research (ANR-08-CREA-031).

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RECOMBINANT FICTION THEORETICAL PAPER AND MANIFESTO.

Paolo Cirio

Recombinant Fiction defines a unique transmedia storytelling genre able to drive tactical activism and dramatic purposes.

Recombinant Fiction Introduction

In previous ages, mediums for narrating fiction such as theater, literature, cinema and television have defined languages, models and formats; each media development provided an expressive shift in forms of storytelling. Nowadays, media are multiplying, hybridizing, and mutating. The way they are used alters continually, potentially creating new ways of producing fiction and spectacle.

Networked digital media merge as a productive vehicle to create new forms of fiction. In fact, the rise of forms of storytelling such as 'Transmedia Storytelling,' 'Alternative Reality Games,' 'Transfiction,' 'Dispersed Fiction' and 'Viral and Guerrilla Marketing' is a clear sign of an important revolution in ways to tell stories.

Recombinant Fiction emerges as a political and aesthetic fiction genre of this new immersive and participative form of art. By identifying valuable, distinctive characteristics and objectives, Recombinant Fiction defines a unique genre able to drive tactical activism and dramatic purposes.

Our contemporary media environment era is characterized by the explosion of Personal Media [1] (devices with platforms for email, instant messenger, blogs, photo and video sharing services, etc.) resulting in new modes of personal expression and interpersonal relations. Nonetheless, Mass Media continues to grow as well. Networked media generates new channels and interconnected devices for consuming entertainment and news (proprietary web platforms, digital TV, portable video/reader players, screen billboard, etc.). This results in the deregulation of advertising restrictions and privacy policies by the corporate media complex to boost the flux of information. Additionally, networked digital technologies accelerate and facilitate the production of offline and analog spaces of information (print-on-demand, production of manufactures, organization of public assembly, mapping public spaces, etc.). This results in a new mass of active prosumers, and a general increase of information in interior and urban landscapes.

All of the above listed media are digital in origin, and therefore easily reproducible and transmissible through networks (Internet, GSM, Wi-Fi, etc.). Networked digital media generate an intensification of flux, interactions and processes of communication. The informative environment, created by all those media that broadcast messages, is defined as the Infosphere. [2] This conceptual sphere is the space in which modern society is immersed; where people express themselves, build their own realities and manage societal organization.

In this context, a modern form of fiction should be narrated by networked media and staged in the Infosphere, which can be used as the medium to dramatize reality and find a way to change it by a dramatic representation, as humanity has always done.

Manifesto:

- 1) The fiction is told through traditional news media, online social media and public space interventions. The pieces of the fiction converge and evolve in one rhizomatic stage, synchronized and organized by networked digital media.
- 2) The fiction has conflicts and resolutions amongst characters with engaging personalities. There are no challenges or gaming aims for the audience, it must be pure fiction and its nature should be obscured but not hidden.
- 3) The fiction penetrates reality by including real entities in the narrative. The created fictional reality is made from contemporary real-world patterns, which are semiologically relinked and mutable in the narrative elements.
- 4) The fiction is interactive and participative. It is unfolded with the active interaction of an audience that can participate in it by creating characters and reshaping the storyline through their personal media and by public interventions.
- 5) The fiction has activist and educational qualities to achieve social change goals, by spotting controversial identities or organizations, or by increasing awareness of real world plights. It must at all times be without commercial or promotional purposes.

Theory for practicing Recombinant Fiction:

Recombinant Fiction is composed of layered mediums, spaces, identities and modes, which can be seen as formally interconnected as a rhizome. [3] The rhizome reflects the abstract network structure, the configuration of the Infosphere. The fiction is told through the convergence [4] of narratives broadcast by networked media. Organized and synchronized, these media create a rhizomatic space of narrative information that audiences can unfold and participate with.

Stage

The convergence of narrative elements broadcast by the media is facilitated by the semiological links that can be created among them. Each media of the rhizome is directed organically to broadcast narrative elements of the story that refer to each other. The networked convergence of scenographic elements creates a rhizomatic totality, recognizable as single stage, where the story is told and evolves. This stage embodies the Infosphere, denoted by the media that broadcast messages and by the messages themselves. The broadcast narrative signs are linked together in a network of signifiers, which constitutes the rhizome in which all the signs used in the narrative build the environment of the fiction. As in semiotization [5] in theater, in the Infosphere, signs present in the narrative rhizome became functional to the construction of the fiction.

The fiction is unfolded by links that refer to each other, creating a semiotic, networked storyline within which the audience can be actively surrounded. This unfolding should not have challenges or ludic elements. Instead, it should simply be easy to interact with and readable by the audience.

Furthermore, this process of semiotization through linking, quoting and cloning signs of reality is thought to integrate real entities into the fiction, transforming real-world patterns into fictional ones, and vice versa, fictional patterns of the story can be perceivable as real.

Characters

Characters in Recombinant Fiction use networked media to enter into dialog and articulate their messages. Characters show their digitally created masks and tell their stories through the disseminated media of the Infosphere that fit and build their personalities.

General identities and entities are made by pieces of information broadcast; which build their existences in the Infosphere and influence directly their presence in the ordinary physical world. The informational body that is broadcast in the Infosphere through media can materialize the representation of the self, a general agency and any activity. This state of being empowers the characters of the fiction to enact their roles with masks that appear realistic and familiar to the audience. Hence, the way characters use these media reveals personality traits and intensifies the emphatic effect on audiences.

Considering the audiences present in the rhizomatic stage of the fiction, they are able to unfold the story and follow the characters' revelations with immediate ease, because characters and audience members share the same tools of expression and communication. This enables the audience to participate in stories by converging their mediated identities of the Infosphere into the rhizomatic narrative stage through their Personal Media (or other media of the Infosphere) and by having direct conversations with the main characters – or even creating new characters - and adding new elements to the dynamic storyline.

The audiences know how to have control over their own characters, since they build their identities and related relationships with others through networked digital media in everyday life. Often the projection of the self onto the Infosphere is characterized by the attempt to appeal to others. This sort of internalization of the spectacularization of representation of the self facilitates the personal reinvention for the performative acting in the fiction.

Through their participation, audiences turn into characters of the fiction. As they develop their personas and create new narrative aspects, the storyline takes shape and opens to new dramatic concepts. In their new participatory role, the audience consciously performs a responsible act in the fiction's dual being, which is both inside the actual social reality and in the fictional story. As the audience shapes the story, they become aware of its fictitious double identity.

Drama

The fiction uses variable forms of dramaturgical structures with interweaved situations among characters. The story is told with dialogs, statements, monologs, public interventions and actions about a fictional scenario that take place in a storyline over the Infosphere's stage.

Characters tell of discoveries, conflicts, reversal, resolution and twists of their existences, through background dramas of interior feelings and foreground plots of public fights. The fiction should trigger the original aims of dramatization of the human condition for cathartic functions, representation of possibilities, and escapism from daily pressures through engaging stories.

In the first person narrative voice, main and minor characters communicate their experiences and claims directly to the audience with their masks. Characters' voices are broadcast over social and any media functional to the expression of the characters. Concurrently other media broadcast information to build the scenography and the atmosphere of the drama.

The fiction is broadcast live. Narrative situations happen in real time. Narrative information is communicated simultaneously with the characters' declarations and dialogs, creating a spectacle that occurs during a concentrated span of time. Audiences permeate the story as they find themselves engaged with the progress of fiction or as they attend scheduled dramatic events.

The action line oscillates on a variable mutable timeline. Multiple references among situations and characters on the timeline make it unbroken and comprehensible as a complete reticulated sequence of narrative occurrences. After the live broadcast, the final documentation of all the narrative elements allows audiences to browse the fiction permanently.

The drama is set in the present, with scenarios contextual to the contemporary society and scripts similar to the ordinary behaviors of the audience. In order to thoroughly penetrate reality with an active fiction, the topic of the main conflict in the fiction should be a real world social matter familiar to the audience and engaged with mainstream media content.

The fictional nature is declared; the audience must notice or perceive to attend at a fictional drama, through narrative patterns blurred with real patterns, to involve the audience in an immersive fiction. Real and illusory events come to inform each other. Memory and associative processes are subtly moving and shifting at all times in relation to the present context.

Tactical functions of the fiction

Over the course of human history, stories have always been used to understand and interpret reality, from religions to ideologies, beliefs and identifications in large narratives have defined civilizations. However, it is in our mediated society that stories replace realities in creating fragmented artificial worlds and capturing people's minds and imaginations within them. Reality continues to be redefined not only by its narrated image as fabricated by the entertainment and media industries, but recently also by the single individual who thinks and produces his/her own image to fit the artificial worlds.

Only by dramatizing the artificial reality of the Infosphere can audiences understand and then change their physical reality, over which they have recently lost control. Recombinant Fiction is about staging a drama inside the hyper-reality and spectacularization of society to engage participants in a process as political agents.

The endeavor toward an efficient modern drama with effective outcomes requires strategy on stages and mediums as well as the employment of a language and aesthetic that speaks to the mindset of an individualized audience. The educational, informative and transformative purposes of the dramatic actions should be developed for motivating and transforming audiences usually indifferent to social issues and for mobilizing victims of oppression. This can be accomplished by infiltrating the audience's language and environments with stories and characters that tempt the attention and interest of the target. Through identification with the characters' dilemmas and public claims, Recombinant Fiction becomes a useful tool to reach new and large audiences whilst creating concern for social issues.

Tactical Recombinant Fiction is a powerful art form to exchange in human consciousness, demystify absurd beliefs, undermining unethical powers and inform on social problems.

Theories that have inspired Recombinant Fiction:

"Recombinant Theatre" by Critical Art Ensemble

"Invisible and Forum Theatre" by Augusto Boal

"TransMedia Storytelling" and "Convergence Culture" by Henry Jenkins

"Dispersed Fiction" by Jason Nelson

"TransFiction" by Alok Nandi

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CORDON OFF THE CONTEMPT IN A WORD COMPARTMENT

(AND OTHER WHISPERING MOMENTS)

Joshua Kit Clayton

A video-directed group exercise/meditation/conversation, "Cordon Off the Contempt in a Word Compartment (and Other Whispering Moments)" investigates the uses and values of contempt, hygiene, language, and importantly, of whispering as a means of containment, paradoxically, through the process of propagation



Cordon Off the Contempt in a Word Compartment (and Other Whispering Moments), 2010, Joshua Kit Clayton. Video/Performance. Documentation of performance at Southern Exposure, San Francisco, USA. Copyright 2010 Joshua Kit Clayton.

CONTEMPT

Contempt. Contempt lives and breathes inside each of us. To deny it would be to deny something essential to the human condition, our relationship to the world around us, and ultimately, our survival. It's no accident our species is filled with such bounty. It spews forth in all directions, externally and internally: Upwards contempt to regain our agency in the face of authority; to fight oppression, injustice, or dominant systems. Downwards contempt to boost our self-image; to morally justify crimes against those we believe to be inferior. Lateral contempt to individuate, defend, and aggress in our struggle with our peers; to form communities around certain ideals. Self-contempt to combat the parts of ourselves we cannot accept; to maintain the fantasies that keep us alive.

Voice of morality; motivation for change; face of justice (and of justification); protective shell; vicious spear; it is all these things and more. It is anger, but anger combined with valuation. And how do we live without values? It is survival. And we would suffocate without its razor-edged embrace. Not only as individuals, but society as a whole. Contempt is an integral part of our emotional and social ecosystem. Obviously, contempt has its problems; its dangers. And you might think that we should only talk about how to eradicate it--contempt for contempt? But, let's put that aside for the time being and celebrate contempt's undeniable existence, its functions, and our reliance upon it.

You, yourself, might be swimming in it right now. Most likely you are. Perhaps it's the contempt for those around you. Perhaps for a situation you just left. Perhaps for your parents, your siblings, your children, yourself. Perhaps for the rambling of some egotistical pundit, whose arrogant words you can't shake. Perhaps for the politicians he was condemning. Perhaps for the bourgeois scum. Perhaps for your local drug dealer. Perhaps for global petroleum addiction. Perhaps for your endless indecision. Perhaps for that tragically catchy pop song that still circles in your head, or the brand markings that adorn your wardrobe, or the spam that ceaselessly pours into your email account, or those fucking obnoxious...

Perhaps it is the contempt you feel for this cursed artwork, or the whole of art in general, and the elitist cabal that operates the levers behind the machine. Perhaps that is art's gift: to present itself as an object worthy of contempt. To be generous in providing something around which people can commiserate as to its arrogance. In which people can assert their own identity in the face of this presumed authority. As they say, "The greatest gift you can give is something to complain about". Well complaint is but the pedestrian face of pure unadulterated contempt!

I digress. Regardless, it's not implausible to assume there's some contempt brewing inside of you. Maybe it's deeper than the surface, but if you take a minute to think, and dig, and poke your way through your inner muck, a golden kernel of contempt will reveal itself to you.

Take a minute to look inwards, and investigate. I can wait. Don't worry about getting your hands dirty. You'll have plenty of time to clean yourself later.

Hold on to that, but for a brief moment, put it aside. Scan the room. Surely you see someone who you don't know very well, but you think you can confide in. Walk to them. Don't be shy. Now that you've found them, and you have found them, haven't you? Hurry up. Okay. Now that you've found them. Sit if you like. Stand if you prefer. This is your shining moment. Where you can let it all out. In vitriolic indignation, or shameless sniveling, or breathless exasperation. Don't hesitate. Speak. Listen. Don't worry. There are no mistakes. Share it with your confidant.

Contempt. Raw and unfiltered contempt. Let it sweep you away.

(five to ten minutes of people talking/reflecting)

HYGIENE

Now that wasn't so bad now, was it? Okay, well maybe it was. Consider it a gift. Now the thing about contempt, is that like I mentioned, you can get dirty. Horribly, terribly, dirty. Filth, infection, and contagion can take over. For all the important uses that contempt does serve, it is extremely dangerous. I apologize for not giving you much warning.

Yes, contempt can take over. Dripping from your mouth, across your face, and down across your entire body. Sliding under your skin, through your sinews, around your bones, back up your spine, inside your mind, and back out again. Wiggle your fingers and toes. Can you feel it the contempt squishing about? Can you smell it? Can you taste it? It's all over you. And not just yourself either, but those around you. It is an infection. An insidious, invasive, infection! And you are the one spreading it.

And so, it makes perfect sense that we often don't voice our contempt. For fear of harming those around us. Those close to us. Those we hold dear. The thought of being responsible for their demise sickens us. Of turning them into loathing contemptuous monsters. But, what about ourselves?

Surely, we don't want to seem to be such monsters either. But, in refraining from sharing, we keep the vermin festering inside of us. And eventually, they will lash out, in unconscious actions, with unforeseen consequences. We must let the contempt out somehow, but what are the means to tame this beast, so that it doesn't demolish everything in its path?

In order to protect ourselves, and those around us, we must cordon off the contempt in a word compartment. Cordon off the contempt in a word compartment. They cannot just be any words, however. We must choose them wisely and meticulously to form a prophylactic barrier to the contempt they contain. But we must also choose them in such a way that the contempt demands. We do not wish to undermine either the contempt itself, or the release we are striving to accomplish.

It is a problem of managed risk. There is no such thing as total safety, only best efforts. And inaction is not an option. Now think back on the words you thought or spoke in the call for "unfiltered contempt". Did your words consider the following criteria? What the contempt itself requires. Your hygiene. The hygiene of those around you. Was it in fact unfiltered? Was it even contempt? Don't feel bad. It can be difficult to synthesize emotion on command. I understand, but I will demand it all the same.

If you are still here, try it again. This time with a consideration of hygiene, and a meticulous choice of words. You can speak with the same person as before, or someone new, or, if you absolutely cannot bring yourself to share this danger with those around you, simply imagine the words that you would say. Or speak aloud to yourself. I won't mind.

(five to ten minutes of people talking/reflecting)

WHISPER

Good. I can already sense the difference. Can you? Reflect upon your consideration, connection, transmission. What happened to your words? What happened to your voice? What happened to your face? What happened to your body? Was it safe? Was it safe enough? Did it contain the contempt? Did it respect the contempt? Was it just the same infectious gripe-fest as before? Do you feel dirty?

Hmmm... I suppose it was not enough. To carefully choose words alone, is not enough. We must also be incredibly attentive to the voice, and the structure the voice forms as it passes between persons. Voice can be a minimal conduit, a vast amphitheater, or a winding maze for the message it contains. The volume, tone, and timbre all provide detailed context. And it too must be carefully chosen, as you work to build this container.

Upward, downward, and neutral inflection. Resonant in your skull, or in your body. Sharpness. Softness. Rhythm. Pauses: why and where. Not only the voices spoken aloud, but the ones inside your mind. The ones that only you can hear. They have their own forms of internal transmission and diffusion.

What can one do to even further contain the contempt, and at the same time respect it, in a supple, non-aggressive form? Like a light misty breeze rolling through you and out into the world.

Yes, a light misty breeze rolling through you and out into the world. The whisper: unpitched, neutralizer of tone; vehicle of confession; quiet, ephemeral, but so present! And again, I will ask you to speak about and/or reflect on these ideas. Contempt. Disease. Words as containers. Respect. The whisper. Voice as structure. Or whatever you like. But whatever you do, do so in a whisper. Even in your thoughts. A whisper.

(five to ten minutes of people talking/reflecting)

PROXIMITY

We are still here. And with the whisper: What happened to your words? What happened to your voice? Where was the contempt? Is it now a secret? What is the function of a secret? Are you trying to keep a secret from me? What is it you are afraid I'll hear? What happened to your face? What happened to your body? Yes, your body. And those around you.

Proximity. The proximity of your body to the bodies of others. Maybe you were able to divert the painful glances of the eyes, as perhaps you whisper in another's ear, but the whisper demands a physical proximity. When was the last time you recall whispering in someone's ear? Who was it you whispered to? What was it you were whispering? Why don't you whisper more often? What are the dangers involved? What if you were to imagine your whispering words, but not say them? Would this be a secret? Would your body show it? And what happens when you touch another body? What happens?

The touch. Again, danger. Respect. Infection. Hygiene. Proximity. Managing risks at every turn. The biggest danger, your hands. What if you were touching someone near you? Perhaps you are already. How would you do so without involving your hands? Specifically, the grasp.

Consider your body against another body without any grasp. No open palm. No way to pull the person towards you. It is a crucial difference. Arm. Elbow. Knee. Calf. Feet. Shoulder. Spine. Head. Chest. Hip.

One last time before we part ways, look around the room, and find someone, or just find yourself. Stand, sit, lie. Contempt, hygiene, whisper, proximity, and touching without grasping. You'll know what to do.

(five to ten minutes of people talking/reflecting/touching)

ROBOTS AS SOCIAL ACTORS: AUDIENCE PERCEPTION OF AGENCY, EMOTION AND INTENTIONALITY IN ROBOTIC PERFORMERS

Kathy Cleland

This paper looks at the different ways audiences perceive and respond to anthropomorphic and bio-mimetic qualities in robotic characters, specifically their perceptions of agency, emotion and intentionality. The author argues that it is audience perception rather than the innate qualities of the robot that determines successful robot-audience interactions.

Analyzing Robotic Performance

This paper analyzes robots as performative entities that create themselves in the moment of their performance and also looks at how audiences perceive and interpret those performances through observation and interaction. Interactions between humans and robots take place in a variety of different contexts. Some of these contexts are explicitly performative or theatrical, including Honda's ASIMO conducting the Detroit Symphony Orchestra, Hiroshi Ishiguro's female android Geminoid-F acting in the Japanese play *Sayonara* and Louis-Philippe Demers's robotic performers in Australian Dance Theatre's (ADT) *Devolution*. These performances are all tightly scripted and rehearsed. Other human-robot interactions take place in more open environments, such as art galleries and museums where audiences can interact with robots in unscripted interactive encounters. Nevertheless, I would argue that there is a theatrical performative element to all public displays of robots. All robots are in essence performers: they are designed to act and interact in the world and are programmed (scripted) to perform in particular ways.

How then can we best analyze the performances of robots across both theatrical and non-theatrical environments? Moreover, how do audiences respond to these robotic performances? While there are a growing number of studies analyzing robots as performers, particularly from the domain of performance studies, [1] [2] [3] [4] it is the work of sociologist Erving Goffman that proves to be particularly useful in analyzing robotic performances and interactions with humans across both theatrical and non-theatrical contexts, such as art galleries and museums.

In *The Presentation of Self in Everyday Life*, Goffman views all human social interaction as a type of acting. We don't have to be on a literal theatrical stage to act, we are all actors who craft and perform different versions of ourselves in our everyday lives depending on which social situations we are in and who we are interacting with. Goffman uses the metaphor of the theater to describe how we move between back stage and front stage arenas using various techniques of "impression management" such as selecting different modes of dress, speech and behavior to perform these different presentations of self to our different audiences. [5]

Using Goffman's theatrical framework, we can analyze the physical appearance and behavior of the robot along with its staging and theatrical mise-en-scène to see how these all play a part in framing the robotic performance and how it is perceived and interpreted by audiences. The back stage preparation of the robot's appearance and behavior includes its design, fabrication and assembly, as well as more conventional types of costuming and dressing up. How the robot is then presented to an audience,

whether this is in a theater, gallery, museum or trade show, also contributes to the overall impression the robot will make.

We can break down these aspects as follows:

- Appearance (robot morphology, for example machinic, biomorphic, zoomorphic, anthropomorphic, and costuming)
- Behavior (the robot's movement and actions including its interaction with its environment and with other actors)
- Context (this includes the environment within which the performance takes place and aspects of theatrical mise-en-scène such as setting, props and lighting)

Goffman's description of back stage and front stage arenas and the team efforts frequently involved in these everyday presentations of self marries itself very well to the production context of robotic performance, which typically includes the artist as well as literal teams of technologists, assistants and handlers who work behind the scenes in the presentation of the robotic artwork. In this team effort, the agency of the performance may be distributed in a variety of different ways between the members of the team and the robot itself. The robot may perform completely autonomously and have its own emergent agency and behaviors (albeit programmed by the artist/technical team) or it may be controlled in more direct ways through automated performance scripts or teleoperation.

Some Case Studies

WADE MARYNOWSKY, *THE DISCREET CHARM OF THE BOURGEOISIE ROBOT* (2008)

There is something of a camp aesthetics evident in Wade Marynowsky's cross-dressing robot Boris in *The Discreet Charm Of The Bourgeoisie Robot*. Although Boris playfully references human attributes in his voice, clothing and behavior, he is still clearly a robot, he is not trying to pass as human. The robot is dressed in an old-fashioned Victorian black dress trimmed with lace but his glass-domed head with its camera eye clearly proclaims his identity as a robot — a robot playing dress-ups. As gallery visitors enter the space Boris whirls in circles and engages them in conversation. Marynowsky's robot is reminiscent of the robot in *Lost in Space*, the Daleks in *Doctor Who* and Robbie the Robot in *Forbidden Planet*, but its historical lineage also includes the famous chess playing Turk, an automaton built by Wolfgang von Kempelen in the late 18th century. Von Kempelen's automaton astounded its audiences with its uncanny chess playing ability until it was revealed that the Turk's prowess was in fact attributable to unseen human operators hiding in the stand that housed its mechanism. Marynowsky's robot is controlled by similar sleight of hand — in this case it is an unseen human operator (the artist) who remotely observes the actions of gallery participants and direct Boris' movements and speech via the Internet.

The mise-en-scène of the performance — the lace-trimmed black dress and the old-fashioned gramophone horns lining the gallery walls — combined with the robot's uncanny whirling when visitors enter his space evokes the feeling of a Victorian séance; especially combined with the spirit possession inherent in his channeling of his master's voice through the Internet.

SIMON PENNY - *PETIT MAL* (1989-2006)

There is nothing human-like in the appearance of Simon Penny's *Petit Mal*. The robot is completely machinic in appearance. It sits on two bicycle wheels joined by an axis with an upright pole supporting three ultrasonic sensors and three pyroelectric (bodyheat) sensors in the front and a fourth ultrasonic at the back. However, although not ostensibly anthropomorphic or zoomorphic in appearance, the constellation of sensors nevertheless acts as a sort of 'head.' A colorful vinyl print covers some of the metal tubing which acts as a counterpoint to the utilitarian machinic appearance of the robot and gives it a more playful and frivolous appearance.

The robot moves around the gallery performance space generally avoiding walls but sometimes lightly glancing off them. It rocks back and forwards on its base as it pursues and reacts to people in its performance environment. It will approach audience members who are directly in front of it up to a distance of about 60cm and try to maintain this front-facing position and distance as its audience interactor moves. If the person comes closer than around 60cm, *Petit Mal* will retreat. However, the robot's behavior can become confused if there are multiple people in the performance area or if it gets cornered. The appearance and gently erratic movement and behavior of the robot contribute to its playful demeanor. The robot's name derives from a neurological term that describes a momentary loss of control or consciousness. The naming of the robot provides its behavior with a psychological frame. Is this robot out of control? Is it psychologically disturbed?

Petit Mal has appeared in many gallery performance environments, sometimes in an open gallery space and sometimes in specially constructed enclosures. The robot (when it was exhibited at Transmediale 2006 in Berlin) performs in a rectangular arena enclosed on all sides by hip-high white walls. This performance area is reminiscent of a zoo enclosure with the audience standing behind the wall to watch the actions of this strange creature. The robot is contained in this space with no other objects or props but audience members are able to enter the space to interact with the robot.

Audience perception of robotic performers

We can conduct a rigorous semiotic analysis of a robot's appearance and behavior and the staging of its presentation as I have done above but this is only part of the equation. The key question remains: how do humans understand and interpret the performance of robots?

In his analysis of the everyday presentation of self, Goffman also places particular emphasis on the role of the audience in receiving and judging the performance. A successful performance is one where the audience views the actor as he or she wants to be viewed. We all test and judge each other's performances. If robots successfully perform the behavioral signifiers of animacy, agency, emotion and intelligence, audiences will respond to those cues. However, the intention of the performer and the intended meaning of the performance is not necessarily what will be received by the audience. Both human and robotic performers are subject to performance mistakes and unintended behaviors. These gestures and behaviors (for example, the jerky movement of a robot or responses that are too fast or too slow) even if they are not an intentional part of the performance will be interpreted as meaningful by the audience and become part of the performance effect.

As Byron Reeves and Clifford Nass [6] have shown, human responses to computers and virtual characters are informed by deeply ingrained physiological and behavioral tendencies and habits. These instinctive physiological responses (such as reacting to facial expressions, body language and movement) and

social responses (such as a tendency to be polite) are carried over from the physical world into our interaction with robots.

When robots display machinic, bio-mimetic or anthropomorphic characteristics, these performative signifiers (sign-systems) are measured against the audience's own experience of other similar entities (human, animal, insect, machine, art) that they are familiar with. The robot's movement and behavior are just as important, perhaps even more important, as its physical appearance in this regard. What the robot does, how it does it, and how it responds to its environment and other entities including audience members are key factors in how it is perceived.

Behaviors that look too controlled and automated can appear machinic and unexpressive. Unpredictable behaviors by the robot in response to its environment and to other objects/people in that environment give an appearance of agency, personality and even emotion. Hesitations, frailties and inconsistencies make the robot appear more like a living organism than a programmed machine. The active interpretive role of the audience is a key factor here. It is the audience's projection of their own meanings onto the performance that generates much of the expressiveness of the robotic performance. This, after all, is how audiences read and respond to the performances of human actors. We interpret each other's performances including perceived intentions and emotions through reference to our own experience and emotions.

In this scenario, whether the robotic performer is intelligent and has emotions or not is not the key issue, it is whether we can tell the difference or not. Human perception and emotional and cognitive responses are more important than epistemological ontologies when it comes to robotic performance. The successful performance of the robot, judged from the audience's point of view, is determined by what the audience can directly perceive in the robot's appearance and behavior rather than by the intrinsic qualities and abilities of the robot (for example, whether the robot is 'truly' aware, intelligent and socially responsive).

As Sherry Turkle comments in her book *Alone Together*, "Computers 'understand' as little as ever about human experience [...] They do, however, perform understanding better than ever." [7] Robots may not be truly alive, but according to Turkle, they are becoming "alive enough" for humans to have relationships with.

The intrinsic qualities of the robot including the sophistication of its manufacture, its sensing systems and Artificial Intelligence (AI) programming are only relevant to the audience to the extent that they impact on the robot's observable behavior and performance. These factors may be highly relevant to scientific robotic research and robotic development but in terms of audience response, careful staging, programming and even trickery may be just as important factors in achieving an effective performance for the audience. Robotic performances may be completely autonomous or assisted by human operators. From the audience's point of view, it may be difficult to tell the difference. Creative staging and showmanship along with elements of deception and trickery have a long history in machine performance, as in Von Kempelen's chess-playing automaton. Wade Marynowsky's Boris has automated sequences and is also teleoperated by the artist and other guest operators, making the robot appear to be much more intelligent and aware of its audience. This hi-tech puppetry and remote operation of robotic performers is also the case with Hiroshi Ishiguro's teleoperated Geminoid robots, which are controlled by the humans operating them rather than acting as autonomous performers. In this process, agency and social intelligence is transferred and delegated from the artist/operator to the robot even though

from the audience's point of view, the intelligence and awareness appears to be coming from the robot performer itself.

Successful acting is all about simulation and making what is unreal appear real. For a robot, this is the ability to persuasively simulate or pass as human, or alive, or intelligent. Alan Turing's famous test used to determine machine intelligence and social performance is essentially an acting test. It measures not whether a computer is intelligent or can think like a human, but whether it can perform as if it is human, or at least whether it can perform well enough to fool a human audience. Turing set out this test for machine intelligence in his influential 1950 essay *Computing Machinery and Intelligence* [8] where he describes the scenario for an 'imitation game' to test whether a computer can successfully imitate a human being. Turing based his test on an earlier game where an interrogator tries to guess the gender of two participants (one male and one female) by asking them questions and assessing their typewritten replies. In Turing's version of the game, he replaces one of the human participants with a computer and suggests that if the interrogator cannot tell the difference between the human and the computer purely from their answers, then the computer can be said to be intelligent. In this way intelligence becomes a functional attribute achieved through persuasive simulation or 'passing' rather than an inherent attribute.

'Passing' or successful simulation means getting it 'just right,' but over-performance and under-performance are more common features of machine performance. Over-performance and under-performance may be perceived in a variety of different ways and can have both entertaining and unsettling effects on audiences. Exaggerated appearance and behavior, including over-emphasized facial features, expressions, gestures and movement are common features of cartoon animation and animated films, where these techniques are successfully used for comic effect and to enhance emotion and drama. More unsettling are the uncanny responses evoked by robots and digitally animated characters that are 'almost but not quite' human in their appearance and behaviour; these responses have been described by Japanese roboticist Masahiro Mori as the 'uncanny valley' phenomenon. [9] [10] These unsettling effects occur when the mimetic aspiration of the work falls just short of achieving a perfect simulation. While audiences generally find lifelike or human-like characteristics in a more abstracted form appealing and empathetic, when these characteristics become more realistic (but not quite right), audiences tend to focus more on the disparities and what is not working about the simulation. The human brain perceives these imperfect simulations as defective versions of the real thing.

As we have seen, audiences judge robotic performances in the same way as they judge any other type of performance interaction whether they occur in everyday social settings or in more staged theatrical environments. The success of the robotic performance depends on two key factors, the *intended performance*, the robot's appearance and its ability to enact or simulate behavior, movement and interactive responses (to its environment and other entities/actors) and the *perceived performance*, the audience's perception and interpretation of the robot's appearance, behavior and interactive responses.

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TOWARDS A TRANSNATIONAL 'CAMPO'

Cecelia Cmielewski

The *Large Screens and the Transnational Public Sphere* research project explores the exchange of information and interactive content between cities identified as media 'hubs' and the impact on the formation of a regional public sphere. This project currently links screens between Federation Square, Melbourne and those managed by Art Center Nabi, Seoul.



Fig 1. "sms_origins", Leon Cmielewski and Josephine Starrs, Federation Square, Australia 2009. Photo: Leon Cmielewski



Fig 2. "Value @Tomorrow City", Seung Joon Choi, Songdo, Korea, 2009. Image courtesy of ART CENTER NABI

The *Large Screens and the Transnational Public Sphere* research project explores the exchange of information and interactive content between cities identified as media 'hubs', and the potential for the formation of a regional public sphere, in this case, the Asian region.

Public screens could become sites to incubate innovative artistic and communication modes that revitalize public space and public interaction. Networked public screens could also function as a nexus for new forms of cross-cultural exchange. Transmitting artwork on a large screen between two cities with public interactive dimensions requires an innovative approach in curatorial techniques, artistic content production. Our approach emphasizes social and cultural values above commercialization of the screens and squares.

Artists' investigations, the changing role of the curator, interaction with audiences, the overcoming of technological differences and financial imperatives, will be described in the context of the issues faced in trying to generate a 'sense of belonging' in many contemporary civic public spaces.

Begun in 2009, research for *Large Screens and the Transnational Public Sphere* will continue until mid 2013 developing interactive realtime artistic events between Melbourne and Seoul to explore the capabilities of different art practices that inspire and bridge communities across two cities.

Our program of cross-cultural exchange and empirical analysis of public interactions around large screens, aims to inform media, cultural and urban planning policy. Our culturally and organisationally diverse team members include theorists, administrators, technicians, artists and curators, from the Art Center Nabi, Seoul, South Korea, Federation Square PL, University of Melbourne, University of Sydney. Funding comes from the Australian Research Council and the Australia Council for the Arts. [1]

THE SCREEN AS TRANSNATIONAL 'CAMPO'

Can recently 'created' public spaces become places of civic engagement - can they become a transnational 'campo'?

The hypothesis being tested is that real-time, interactive artwork presented between nations, on large public screens can have a positive impact on how we engage with one other and, in a broader sense, affect our civic lives.

Our aim is to inform media, cultural and urban planning policy to revitalize public space and public interaction by increasing risk-taking and creative opportunities.

Current urban planning policy in Australia, for example, treats electronic screens in much the same way as static billboards. This underestimates the possibilities for public screens to be sites that incubate innovative artistic and communication modes. Current policy also ignores the potential for networked public screens to function as a nexus for new forms of cross-cultural exchange.

The tendency is to regulate the scale and location of public screens based on the assumption that the primary use will be advertising or passive programming. Urban policy needs to address the resulting paucity of civic engagement when screens only support centrally regulated content that treats viewers

as passive spectators. To provide informed urban planning guidelines, we need a clearer understanding of the spectrum of potential uses of public screens and address the common perception that content produced by artists is free. Artist's development and production time should be allocated during budget development and allocation as a part of civic forward programming.

The aim of the *Large Screens and the Transnational Public Sphere* project is to show what an interactive city can be or should be. We envision the city as a living organism that expresses in real time its emotional and physical states. We dream of a new collectivity based on diversity. This is possible with today's media. The large screen works as a window to other cultures, airing cultural and artistic contents from around the world. But as cities develop and their populations expand, it becomes clearer that public art should also be able to question our notion of the 'civic', reflecting on it, asking if there are any holes, rather than conforming to it. The term 'civic' can be refined and redefined by good public art. In the end, it is a process of cultural negotiation. Through this project, we are proposing both new modes of experience to share with and between people, delivered by a new *template* for content delivery — across countries, across screens. Mediated by technology, but inherently live.

THE ARTISTS

Artists can seek to encourage subtle shifts in how public's think of themselves and each other. This is particularly so, when the work being presented requires the public to interact with it in real time, and, therefore have a crucial role in realising and performing the work.

THE FIRST TWO ARTWORKS

In August 2009, two artworks were presented simultaneously on the Incheon (South Korea) and Federation Square (Australia) networked screens, with the public invited in both places to interact with the work and with one another. These projects related in a delicate way with each other, both articulating identity in some way, beginning what is becoming a poetic transnational creative dialogue.

sms_origins uses the large screen as a public sms graffiti board. Leon Cmielewski and Josephine Starrs conceived and designed the piece working closely with programmer Adam Hinshaw. A phone number is displayed on a large screen in a public space along with the instruction "sms the name of the country you come from.". When participants sms their (and/or parents or grandparents) country of origin a curved vector is added to the map of the world displayed on the large screen, which updates in realtime as it receives texts. The map of the globe then becomes a platform for a more dynamic understanding of the people with whom we are sharing that public space. The purposefully innocuous design of the screen becomes geographically alive to share our personal heritages. *sms_origins* reinforces concepts of global citizenship and multicultural societies. Importantly, this work provides an entrée for the less extrovert, leading to a greater sense of participation and shared histories. The work is designed with a simple appearance, although the programming is far from simple. The complexity of global migration is revealed and, in a very undemanding manner, provides a collective platform that generates a sense of the evenness of our demographic histories.

The concept, design and programming by Seung Joon Choi in <Value> explores what is important to people. A word sent via sms responding to the question "what is valuable to you" generates a text and data flow. The wordcloud expands depending on how importantly people value each word. The words may

be 'love'/'networking'/'home'/'joy'. <Value> expresses what any particular group, in that time and across space, wish to emphasize. Choi says that 'pursuing or choosing values in our lives can lead to vital decisions at times'. <Value> suggests that we take a step back and lightheartedly explore whether it is possible to harmonise different values. We are familiar with this tool now (in 2011) as information clouds, but this remains important work, as it still not commonplace for data on group values to be collected and displayed in this way.

Both projects set and achieved very ambitious aims – working cross culturally and transnationally in a real-time public interaction bridging two urban screens. We are building on this initial experiment to develop a range of artworks that include live performance, interactive sound, simple gestural and imaging based on the specific sites. All this, and the overarching aim to investigate how best to foster a sense of community, makes for fascinating dynamics.

THE CURATORS

Traditionally a curator acts as a carer, someone who is meant to minister to the immediate needs and longterm survival of artworks. Over the past fifty years or so, the curator has also been charged with caring for artists and for the events that tend to transpire around artists. Indeed, with the rise of 'participant' cultural phenomena such as performance art, relational aesthetics, interactive and emergent installations, the curator has become a kind of behind-the-scenes producer as well as a creative diplomat.

The intention of socially engaged practice challenges or sometimes blithely ignores the gallery context of the artworld. There are many for whom the 'outside world' is now the relevant domain for artistic encounters. Where the rules are wider and wilder in this boisterous world of vernacular experience.

Our aim is to effectively curate interactive and emergent artworks that are specifically designed for large public screens. However, the legal and technological context of public screens run counter to conventional artistic development and presentation. The screens are 'public' because they carry their sound and image streams into the civic domain. When we add the additional possibilities of public engagement there is a potential for the kind of spontaneous response not normally associated with the gallery system with the hope that this may engender the (re)democratisation of civic spaces.

But we are not quite there yet! The corporate entities who manage the screens require a cohesiveness of the programming as well as a predictable 'behaviour' of the public. Adopting the familiar template of the television broadcast, reduces the risk of an unplanned empty screen, a failure to be avoided at all costs. Turning over the technology to artists to test out their ideas first is often a hard-won negotiation. The artist wants to be able use these screens and spaces to play and experiment - to see what happens and to explore the creative questions that arise. Again, not every artist can leave their egos at the pavement to transition into experimenting in these uncertain public spaces. Conventional training certainly has not helped them in this kind of public risk taking endeavour either. These are artists who have developed a publically engaged practice through experience. Part of the curators role is to find the common ground for sharing the aspirations that are sincerely driving presenters and producers, and to figure in the engagement with the public.

THE AUDIENCE

The first audience evaluation for this project was conducted in August 2009 during the live telematic broadcast of *sms_origins* and <value>. A survey was conducted at the Tomorrow City's Plaza, Incheon, and the same survey was trialled simultaneously at Federation Square. Evaluations from Korean responses revealed a high rate of participation with the interactive art works on the large screen. More than three quarters of the audience engaged with the new media art using text messages, and considered such interactions successful in forging cross-cultural ties. Many also expressed enchantment towards the new art forms shown on the large screen. These experiences of enchantment and shock reflected the high modernity of the megacity, as envisioned by the Incheon City planners. Although audiences were acutely aware of the top-down urban regeneration of Incheon, their responses revealed how the networked screen could potentially create a transcultural space mediated by their individual experiences of media consumption. [2]

The second audience evaluation was held across three months from September to December 2010 at Federation Square during further screenings of *sms_origins*. The broader political climate in Australia at this time was marked by rising racial anxiety. Issues of migration dominated public discourse. SMS responses to the work showed that the participants were themselves migrants or had family members who had experienced migration. In analyzing these participants' responses, it appeared that most embraced the ideology of a multicultural Australia — the idea of Australia as a country of migrants — as most reacted positively to the diverse ethnographic demographic of users in the square.

At the Songdo event, respondents were predominantly urban Seoul dwellers in the age group between twenty and forty. Older people and those from the surrounding rural province of Songdo did not participate. From the production cycle of curating and technological networking, to the consumption of its practice as an event, such exchanges highlight the politics of access and distribution that underpins the mobilities proffered by the large screen.

"HELLO" PROJECT

The next experiment will be presented in early October 2011. We aim to present an alternative that resiles from the necessary approach adopted in 2009. In particular, we aim for the artists to experience a more playful ambience and be able move away from "broadcasting" methodology. "HELLO" is a performative work based on gestures gathered from a range of multicultural groups in Seoul and Melbourne.

The evolution of this project is worth outlining as its gestation covers the kinds of interactions involved in this research.

The idea, based on the practice of Australian choreographer, Becky Hilton, in collaboration with Korean choreographer, Soon-Ho Park, is that gestures are gathered from various groups, five gestures are subsequently selected to form a choreographed sequence. These are then exchanged one-on-one between participants to produce an unanticipated dance.

The concept has been through several iterations, and at one point the thought was to include public organisations such as the Korean army, folkdancing troupes and the volunteer fire brigade. The idea is now distilled into a more secretive and seductive 'Chinese Whispers' where, in a tent or temporary enclosure in both sites, one dancer shows another the movements, who then repeats their memory of the moves to a new performer. The crowd outside only sees the participant that receives the gesture being passed on. The final reveal to the public is the combined results of all the gestured "movement-whispers." This

iteration of the idea stems directly from the transnational aspects of the project as it addresses the concerns of the Korean partners about individual reticence to spontaneously perform in public. In turn, the Australian ideas of multiculturalism were taken up by the Korean choreographer with gusto, providing a way in for them to workshop with local multicultural organisations for the first time.

Because of our enthusiasm, the project had quickly and imaginatively leapt into the paradigm of the 'big event'. This in turn fed the paradigm of the 'high production broadcast' and unwanted pressure on the part of the artists and participants. We needed to scale-down to maintain a simple approach while keeping the role of the artist and the core concept at the heart of the project. The resulting new approach does this and aims to extend the technological uses of ready to hand programs such as Skype. Engaging the public in this scenario now becomes the main challenge. We hope people will begin to replicate the movements themselves in a spontaneous response to what they are seeing on the screen, creating yet another version of this contemporary "folk dance."

Throughout, the curators have found that the primary discussion, which needs reinforcing all too frequently, is to keep the artist at the core of the project. And all the while, investment in maintaining good will from all the partners is paramount. It is where most of the energy of this project has been expended — with excellent results in navigating and developing the transnational relationships over the course of this chapter in the research.

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1. *This paper includes extracts from a journal paper pending publication in 2011, with written contributions from research partners: Nikos Papastergiadis, Scott McQuire, Amelia Douglas, Ross Gibson, Audrey Yue, Sun Jung, Cecelia Cmielewski, Soh Yeong Roh and Matt Jones.*
2. *A. Yue and S. Jung, "Urban Screens and Transcultural Consumption between South Korea and Australia" in Global Media Convergence and Cultural Transformation: Emerging Social Patterns and Characteristics, ed. D.Y. Jin, 15-36 (Philadelphia: IGI Global, 2011).*

REMOTE INTERVENTIONS

CECELIA CMIELEWSKI

Australia may be one of the most urbanised and coast-dwelling populations in the world. However, our imagined and projected national and self-images also tend towards the expanses of the interior and the 'bush'. I will explore some examples of what 'remote' means in the context of an imagined Australia and transnationalism.



Fig 1. "BirndiWirndi – Worlds Apart", Sohan Ariel Hayes and Michael Woodley, Roebourne, Western Australia, 2010. Image courtesy of IASKA Spaced.



Fig 2. "CrayVox&", Nigel Helyer, Post Office Island, Houtman Abrolhos, Western Australia, 2011. Photo: Nigel Helyer.

Australia may be one of the most urbanised and coast-dwelling populations in the world as more than 80 per cent of Australians live within 100 kilometres of the coast. [1] However, our imagined and projected national and self-images also tend towards the expanses of the interior and the 'bush'.

I will explore some examples of what 'remote' means in the context of an imagined Australia and transnationalism. This means we can bring issues of working across cultures, landscapes and nations into the discussion and presents an opportunity to discuss how many of the more interesting art works stem from their collaborative forms.

Two Australian arts organisations that work consistently in remote Australian communities are IASKA and Darwin Community Arts.

IASKA SPACED

IASKA (formerly International Art Space Kellerberrin Australia) has a long history of fostering innovative art projects in regional and remote areas and is regarded as among the most interesting art organisations to have emerged in Australia in the past decade.

Spaced is a Global/Local Community Exchange Through Art and Technology.

Conceived and organized by IASKA (*International Art Space Kellerberrin Australia*), *Spaced* is a new biennial visual arts project that links local communities throughout rural Western Australia as well as several overseas locations. *Spaced* forms a multi-voice but unified project that explores the relationship between local identity and the social, cultural, environmental and economic effects of globalisation. The projects draw on art and digital technology to implement cultural exchange between geographically and culturally distant communities. It features residencies, exhibitions, site specific works, educational and mentoring activities, a web-based forum and a publication. [2] The first iteration of the biennial will be held at Fremantle Art Centre in February 2012.

The methodology of *Spaced* is to partner with local community groups who invite professional artists to stay with them for substantial periods of time and produce artworks that articulate the specificities of these remote communities. Frequently there will be particular issues that are already explicit, but as frequently the issues may take some time to filter through to the stage of articulation. The artists who are most successful in these endeavours will have developed this ability to work within a community setting to realise high-quality artworks.

Marco Marcon, the director of *Spaced* and co-founder of IASKA, explains:

Spaced offered another innovative curatorial approach that involves the direct and active participation of a network of partner organisations and communities. It involves visual and media arts projects created by artists working on-site with a wide range of local social and environmental situations. *Spaced* centres on contemporary art practices with a strong social focus; it comprises context-responsive projects, international exchanges and a multi-purpose online hub. [3]

BIRNDIWIRNDI – WORLDS APART

One such project, *BirndiWirndi – Worlds Apart*, formed part of the 'work-in-progress' phase for what has now become the Spaced biennial. In late 2010 Sohan Ariel Hayes spent two months in Roebourne working on a collaborative project with Michael Woodley from the Juluwarlu Aboriginal Corporation.

Roebourne is located 1563km north of Perth in Western Australia's Pilbara region. IASKA's project partner, Juluwarlu Aboriginal Corporation, is an Indigenous organisation dedicated to the recording, preservation and maintenance of Yindjibarndi language and culture. Juluwarlu professionally collects, records, documents and broadcasts the language, culture, history and the contemporary lives of the local Indigenous people. Sohan is an award-winning animator and visual artist who works across media.

Sohan works closely with Michael and the community on a number of projects including outdoor projections at community gatherings and a series of editing and filmmaking workshops to assist Juluwarlu to achieve its goals. *BirndiWirndi – Worlds Apart* is a video-based work depicting the hearts, minds and spirits of the Yindjibarndi who, despite the enormous forces of the mining boom, still stand strong. The work was recently projected onto the now boarded up Victoria hotel in Roebourne.

The word is that this is the most activated Roebourne has been for quite some time. The local community and the Aboriginal Corporation are looking to extend the project with this artist - a sure indication of the success of this remote intervention and collaboration.

CRAYVOX

The Island, a cemetery exhaled by the sea.

The tree of life, calcinated to a bleached white clinker raft.

Whilst all around, submerged beneath the endless sheet of water

Fronds branch and entwine, filament and fan, knoll and star

Electric pink jostles acid green, fading to sombre blue where the sharks sleep.

Nigel Helyer, 2011: [4]

On the tiny Abrohlos Islands archipelago off the coast of Geraldton (500kms north of Perth, Western Australia), Nigel Helyer spent two months with the crayfishermen and women for the Spaced biennial. Living and working on a number of these very remote islands which are made of calcified coral, he formed ties and recorded the tales of these very independent people.

Nigel Helyer is a sculptor and sound artist whose inter-disciplinary creative practice links art with scientific research and development. His research for the work will continue by linking in with the destination of the crayfish which are shipped directly to Taiwan. Helyer will spend time there with the import companies as well as restaurants and chefs who are the next main part of the chain of relationships in this project.

The resulting piece, *CrayVox* aims to present some of the issues of marine food security, environmental change, water security, and folklore, myths and oral histories. A small vessel will be equipped as a floating media and biology lab and will also serve as the artist's accommodation. The artist will operate the vessel's scientific and technological systems and engage in a creative manner with the fishing communities, their related service industries on-shore and the research section of the Department of Fisheries. The community has been selected to highlight a unique cultural, environmental and economic activity within the region. [5]

DARWIN COMMUNITY ARTS: *FRONTLINE*

Moving to the top end of Australia, to an outlying area of Darwin we come to Malak, where Darwin Community Arts is active in an outreach program with local Indigenous and recently arrived refugee teenagers.

Since 2009, Darwin Community Arts (DCA) has facilitated a locative media project in the Malak area of Darwin. *Frontline*, builds on previous work by DCA dealing with the relationship of Indigenous, African, and other communities in Malak and the northern suburbs of Darwin, enhancing its "community arts intervention" in Malak through locative media. [6]

Malak is considered a frontline suburb for confronting social, economic, and cultural issues facing Darwin today. It is also the frontline for exploring positive changes, including cultural changes, at a local level. This is why DCA is based in Malak; they seek to make a difference at the frontline.

Frontline builds on DCA's work in Malak since mid 2007, which has included running a Telecentro (community based Internet access facility), facilitating workshops on digital media, and hosting Darwin Fringe events.

The project engages with all communities in Malak, including but not limited to Indigenous and African youth, with whom DCA has worked since 2007. Special attention is given to engaging young people, particularly Indigenous and African young people who make up a significant proportion of the population, and who have featured prominently in tensions in the area.

The Malak Telecentro -- in Shop 10, Malak Shopping Centre -- offers broadband access to the Internet and digital office and production facilities free of charge to the community. It currently has a running network of twelve (12) personal computers with the Ubuntu GNU/Linux operating system, and one (1) Apple eMac; there are more computers that are in storage, slated for setting up later. WiFi connectivity is available for Telecentro volunteers.

The computers and other equipment were donated mainly by Charles Darwin University, and also by St John's College, Bunji Elchoate, Controlability, Taminmin High School, Bees Creek High School, and Mike Foley. The furniture is mainly from NT Government surplus stores. Other equipment was provided by Darwin Community Arts, which operates the Telecentro.

NT Freenet (<http://www.the-mesh.org>) provide technical advice and support for the Telecentro and related projects. The Telecentro is staffed mainly by volunteers from Darwin Community Arts, Melaleuca Refugee Centre, and NT Freenet. [7]

Participants have been experimenting with open-source laser tagging and LED Throwies during the Darwin Fringe, at Malak Shopping Centre and car park and more recently with tagtool at the Darwin Parliament House.

The methodology of DCA is to use media in a number of forms, with the intention that interest will be maintained with groups of, predominately, teenagers. Other media forms include:

- **Amazing Malak:** A version of the Amazing Race, which has proved popular with young people in Darwin, organised through vacation care programs. This game/race is held across Malak's parks and other places, with on- the-ground racers working with virtual, online participants in spaces such as Second Life.
- **Computer Kiosks:** Computers placed around Malak to accept video blogs and other contributions that annotate and trace people who come through these spaces.
- **Interactive Spaces:** Multimedia presentations are made about the spaces themselves (e.g. film or video clips) and triggered by movements of visitors to them.
- **Online Social Mapping:** Residents are encouraged and assisted to post information about places in Malak and surrounding areas on Google Earth/Maps.

Frontline is a great example of how collaborative artistic interventions can work by using the kinds of activities the young people are interested in. It aims to move them from breaking into the shops in the mall and acting out in the streets, to making art in one of the shops in the mall and taking that to the streets.

LARGE SCREENS AND THE TRANSNATIONAL PUBLIC SPHERE

The *Large Screens and the Transnational Public Sphere* research project explores the exchange of information and interactive content between cities identified as media 'hubs', and the impact on the formation of a regional public sphere. This project currently links screens between Federation Square, Melbourne and those managed by Art Center Nabi, Seoul. [8]

Begun in 2009, research for *Large Screens and the Transnational Public Sphere* will continue until mid 2013 developing interactive realtime artistic events between Melbourne and Seoul to explore the capabilities of different art practices that inspire and bridge communities across two cities. [9]

Our program of cross-cultural exchange and empirical analysis of public interactions around large screens, aims to inform media, cultural and urban planning policy. Our culturally and organisationally diverse team members include theorists, administrators, technicians, artists and curators, from the Art Center Nabi, Seoul, South Korea, Federation Square PL, University of Melbourne, University of Sydney. Funding comes from the Australian Research Council and the Australia Council for the Arts.

THE SCREEN AS TRANSNATIONAL 'CAMPO'

Can recently 'created' public spaces become places of civic engagement - can they become a transnational 'campo'?

The hypothesis being tested is that real-time, interactive artwork presented between nations, on large public screens can have a positive impact on how we engage with one other and, in a broader sense, affect our civic lives. We intend to inform media, cultural and urban planning policy to revitalize public space and public interaction by increasing risk-taking and creative opportunities.

The aim of the Large Screens and the Transnational Public Sphere project are to show what an interactive city can be or should be. We envision the city as a living organism that expresses in real time its emotional and physical states. We dream of a new collectivity based on diversity. This is possible with today's media. The large screen works as a window to other cultures, airing cultural and artistic contents from around the world. However, as cities develop and their populations expand, it becomes clearer that public art should also be able to question our notion of the 'civic', reflecting on it, asking if there are any holes, rather than conforming to it. The term 'civic' can be refined and redefined by good public art. In the end, it is a process of cultural negotiation. Through this project, we are proposing both new modes of experience to share with and between people, delivered by a new *template* for content delivery — across countries, across screens, Inherently live, Mediated by technology.

This is a highly collaborative arts-based project between nations and cultures where the role of the artist and the project teams are closely intertwined.

The first two works which blazed the trail related in a delicate way with each other, both articulating identity in some way, beginning what is becoming a poetic transnational creative dialogue.

'sms_origins' uses the large screen as a public sms graffiti board. Leon Cmielewski and Josephine Starrs conceived and designed the piece working closely with programmer Adam Hinshaw. A phone number is displayed on a large screen in a public space along with the instruction "sms the name of the country you come from." When participants sms their (and/or parents or grandparents) country of origin a curved vector is added to the map of the world displayed on the large screen, which updates in realtime as it receives messages.

The concept, design and programming by Seung Joon Choi in '<Value>' explored what is important to people. A word sent via sms responding to the question "what is valuable to you" generated a text and data flow. The wordcloud expands depending on how importantly people value each word. The words may be 'love'/'networking'/'home'/'joy'. <Value> expresses what any particular group, in that time and across space, wish to emphasize and suggests that we take a step back and lightheartedly explore whether it is possible to harmonise different values.

The current work-in-progress is the "HELLO" project. The idea, based on the practice of Australian choreographer, Becky Hilton, in collaboration with Korean choreographer, Soon-Ho Park, is that gestures are gathered from various groups, five gestures are subsequently selected to form a choreographed sequence. These are then exchanged one-on-one between participants to produce an unanticipated dance.

SANS-FRONTIERS

The scale and impact of the works I have described vary significantly in terms of the support systems and populations involved; however, the basic premises for successful artistic collaboration remain fairly

consistent. These include the need for great investment in time, communication techniques and expansive thinking beyond borders. We could also consider these remote interventions as effective *artistes-sans-frontiers* projects.

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8. Please see the full paper for ISEA2011 on the Large Urban Screens and the Transnational Sphere is entitled "Towards a transnational campo."

INCOMPATIBLE ELEMENTS

Leon Cmielewski & Josephine Starrs

Incompatible Elements is an ongoing project that evolved during an artist residency at Performance Space, Carriageworks, Sydney. The media art installation explores ways of representing the relationship between nature and culture, embedding poetic texts into animated satellite images of global landscapes at particular risk from climate change.

AUTHOR(S)

The failure of nations to reach an agreement to curb carbon emissions has highlighted the huge gap between the scientific consensus and public perceptions of climate change and its effect on our planet. Responding to climate change in ways that are mythical, biblical and chemical, Josephine Starrs and Leon Cmielewski's media artworks question the urban perception that we exist apart from or outside of nature.

Commercial interests often co-opt nature, using images of animals, landscapes and seascapes to sell their products. Telecommunications companies consistently use wildlife, such as eagles, lions, and primates to promote their communications and IT products, but there is no acknowledgement made of the wildlife they are exploiting. In response to this trend, filmmaker and photographer Gregory Colbert attempted to create the Animal Copyright Foundation to enable advertisers to donate to conservation. He calls it "renegotiating our contract with nature." [1] More recently, Bolivia is about to pass the world's first laws granting nature equal rights to humans. [2] In the same way that advertisers exploit nature, the IT industries have also usurped words like 'web' and 'surf' from nature in which to dress their new products, the most recent being the word 'cloud', that ephemeral space where million of people now store their music and data. The cloud that Silicon Valley alludes to is in reality a network of massive data centres consuming enormous amounts of electricity, which in turn generates vast amounts of CO₂, negatively affecting the real clouds and atmosphere.

In the visual media field, re-rendering the familiar in new ways is a strategy to encourage audiences to reconsider cultural assumptions. For example, an Australian's familiarity with the map of their country was challenged by Norman Tindale's 1940 Aboriginal Language Map of Australia. [3] Here was an astounding re-rendering of the familiar, with the display of so many indigenous language groups, far more than our limited education had lead us to imagine. It was enlightening to see one's country divided up in such an unfamiliar way, where those comforting but arbitrary boundary lines between Queensland, New South Wales, South Australia & Victoria had been erased by a very different set of boundaries, where people had a more profound difference than the brand of beer they drank: the difference of language.

In our previous artworks *Seeker* and *sms_origins*, visualisation and mapping are critical devices used to explore the impact of globalisation in relation to issues of diaspora, community and nationalism. Our current project *Incompatible Elements* is a media art installation that attempts to re-present the relationship between nature and culture, by embedding poetic texts into animated satellite images of landscapes suffering from the stresses of climate change. There is a long tradition of artists combining text and image to communicate ideas and concepts, and we source texts from local custodians or appropriate works of literature.

Only relatively recently have the general public had access to the god's eye view of satellites, which has been democratised by the flourishing of the likes of Google Earth & Google Maps. This previously specialised tool of government planners and the military allows us to visualise what the earth might say if it could speak back to us. The intention is to configure the land itself as active, not neutral; to imagine it being able to speak and make a comment about the impacts of climate change. This form of personalisation of the land has been further developed by working with indigenous people who generously provided their own perspectives about land as invested with cultural and spiritual attributes. For example working with Maori elders in New Zealand to incorporate Maori language into aerial photographs of Aotearoa.

Using a bird's eye view as a representation highlights the way the land often is embedded with a cultural imprint. This is evident in the NASA aerial imagery from Agricultural Patterns from Space [4] that show ways in which human inhabitation leaves particular traces and patterns on the landscape. For example, the circular forms of large scale irrigation farming compared to settlements in Peru where each farm plot is a radial slice of land focused on a small village. We can see that the land is shaped by human activity in a variety of ways depending on cultural attitude and technological intention. In *Incompatible Elements*, the words "days like these" (lyrics from John Lennon's song "Nobody Told Me") are embedded into an image of the Ganges Delta, where the land is being inundated due to sea level rise resulting from global warming. In an area in South Australia called the Coorong, a world heritage wetlands at the mouth of the Murray River, we have embedded and animated the text 'a living body'. This is a quote from Tom Trevor, a Ngarrindjeri elder who is a custodian of this land. He spoke these words on the steps of the South Australia Parliament house at a public rally protesting the destruction of the river. [5] The Ngarrindjeri people see no difference between land and sea, perceiving the river systems as a living body and are concerned about the degraded state of the Coorong.

In early 2011, we attended SCANZ (Solar Circuit Aotearoa New Zealand) spending three days in the local Marae at New Plymouth/ Taranaki, NZ, where we met Maori Elder Dr. Te Huirangi Waikerepuru. After showing him our previous work he granted permission to use Maori poetic texts to incorporate into aerial photographs of Aotearoa. We experimented with embedding the words WAI O TAPU (sacred water) in the area around the Tasman Glacier, which is melting and retreating due to climate change.

Through consultation with locals, we learnt of the erosion problems and landslides effecting Mt Taranaki, the majestic conical mountain that dominates the landscape in New Plymouth, New Zealand. Local people described hearing the sound of boulders and rocks crashing down the mountain at night. In a satellite image of Mt. Taranaki, we embedded the words PUWAI RANGI PAPA or 'waters of radiant sun and earth mother'.

...when permission is granted by an elder of the region for a story to be told and te reo (Maori language) to be used, the artists are provided with a place from which to transmit important messages across cultures. If settler cultures can shift from conceiving landscape or weatherscape as inert matter 'to-be-looked-at' to living bodies encompassed in Maori terms such as 'mauri' then we come closer to ecological reconciliation. Puwai Rangi-Papa could signal an important shift in articulating a reconfigured political ecology where Western environmentalism and indigenous cosmologies might join in restoration and care of the land. [6]

The videos in the installation are projected onto the floor to reinforce the god's eye view when looking at satellite images. The light boxes on the floor show close-up images of degraded riverbeds where mud

has turned to acid and has taken on a fluorescent red/rust appearance. Sydney artist Alex Davies created the surround soundscape alluding to sounds of water, dust, chemical reactions and satellite static.

As Performance Space curator Bec Dean wrote of *Incompatible Elements*, “Starrs & Cmielewski engage in a kind of digital geochemistry, terraforming new waterways and barren patches of sand that tell stories in winding, cursive script.” [7]

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THROUGH THE WEB BLOCKS

Yiannis Colakides

"Through the Roadblocks" was conceived as a transdisciplinary project which examines ways with which information transverses geographical, political, social, economic, cultural and virtual borders is adopted through assimilation and transmutation, this short paper presents some existing roadblocks in our media landscape.

"We very soon got to six yards to the mile. Then we tried a hundred yards to the mile. And then came the grandest idea of all! We actually made a map of the country, on the scale of a mile to the mile!" (L. Carol, 1889, Sylvie and Bruno Concluded: The Man in the Moon)

As the information highway is getting faster it is also getting bigger currently consisting of over 250,000,000 domains but, more is not always better. Surfing within these domains we find sites with thousands of pages and others with millions, some of which inform and others misinform. Similar to the propaganda rhetoric of the cold war era, we again, can not distinguish real from fake information. The web's exponential growth iterates Lewis Carol's map where too much information becomes incomprehensible. Are we experiencing a new information driven renaissance or are we falling into the digital dark ages?

Although "Through the Roadblocks" was conceived as a transdisciplinary project which examines ways with which information transverses geographical, political, social, economic, cultural and virtual borders is adopted through assimilation and transmutation, this short paper presents some existing roadblocks in our media landscape.

A HIGHWAY OR A ROADBLOCK?

On June 16, 2009, Reuters news agency reported that the US Government contacted Twitter to "urge it to delay a planned upgrade that would have cut daytime service to Iranians who are disputing their election." [1] *"The revolution may not be televised in Iran, but it may well be tweeted"* 'ragnarokker' wrote two days later. This year Facebook and Twitter continued their adopted role as unconventional platforms where revolutions are incited and reported. But was this a logical development from blogging to citizen journalism to social networking, climaxing into social upheaval? These cloud based tools according to Richard Stallman are contaminated as "The U.S. government is encouraging people to go on the cloud because it can seize that data without the need for a search warrant." [2] In web 3, the trend points towards social engineering geared towards macro political goals reinforcing Gómez-Pefia's comment that in discussions of electronic media "twenty years of post-colonial theory simply disappear." [3] Smart Mobs [4] might not be as smart after all and cyberspace as a "technologically mediated space of cognition, communication, and cooperation" [5] might be becoming a thing of the past as the activists become more technologically aware. For now Rheingold's 2005 statement "the designs that dominate early in the growth of a technology can have disproportionate power over the way the technology will affect power structures and social lives" [6] has become eerily prophetic.

A ROADBLOCK ON THE HIGHWAY

One of the popular definitions of web 3 is 'a fast broadband to the internet always and everywhere'. This definition assumes an international infrastructure and access to the latest hardware and software. The current model both enables and constrains this aspiration as it relies on the financial capabilities of individual countries whilst the access to the information depends on economic class but also, in Pierre Bourdieu's terms, the cultural capital. The current volume of the net assumes that you read and write a European language (preferably English or Spanish) whereas if one wants to be involved in programming or scripting, English is the only available language which results in the exclusion of the non english speaking population or creating an unfair advantage at best. It might not just be the funding and infrastructure which makes the US a leader in software development but as software controls content, content can become prejudiced.

COLLATERAL DAMAGE

According to Zuckerman, people are "interested in seeing cute cats being adorable online. When the government blocks DailyMotion, it impacts a much wider swath [...] than those who are politically active. Cute cats are collateral damage when governments block sites." [7] The dominant western view criticizes China's firewall which blocks part of the internet within its borders but this very same view blindly accepts the access limits and censorship on cloud computing based software. Google has in the past two years developed algorithms which block any YouTube videos which they recognise as bridging their content guidelines. Facebook goes one step further. During the Egyptian uprising earlier this year, online activists created facebook groups where plans of action were discussed. One such group was the 'April 6 Strike group' which eventually reached 76,000 members. [8] The group was administered by two users, Rashid and Maher who were moderating the messages. Maher started sending messages to the group which eventually resulted in getting him banned from Facebook as the software recognised them as spam not because of message content but because of message frequency. The absence of human judgment in the administration of large sites presents us with yet another restriction to our freedom reinforcing Zuckerman's argument "the tools that have become most useful to activists have characteristics that un-recommend them for activist uses." [9]

THE CONNECTION HAS BEEN RESET

Every site's server we visit records our IP address as well as other computer specific information. Our internet footsteps are recorded, existing as latent documentation with a potential to be analysed by webmasters or official and/or unofficial agencies. Collecting IP addresses has been recently made illegal in Germany and browser cookie serving will be made illegal in EU without the surfer's prior consent. The German law prohibits the collection and processing of IP addresses whilst the UK law seems to be clear regarding website owners who "must not store information or gain access to information stored in the computer (or other web-enabled device) of a user unless the user 'is provided with clear and comprehensive information about the purposes of the storage of, or access to, that information' and 'has given his or her consent'." [10] '*Wir speichern nicht*' has become a motto amongst the Apache server users in Germany but the rest of Europe is slow to follow whilst in many other countries, the discussion has not even begun.

Unlike online social networking software, where identities are exaggerated or faked, IPs and MAC addresses can be pinpointed to a particular computer in a particular street address. Rashid's Facebook protest resulted in her arrest by the Egyptian security forces. Our telepresence is currently traced and our online privacy is mostly non existent.

THROUGH THE WEB BLOCKS

Cloud computing software might be appropriate for banal tasks like sharing pet photos or promoting a business but may be considered careless or naive for organising a protest against an oppressive regime. Nevertheless "There are times [...] when issues of autonomy, of voluntary cooperation, and the liberation of desire have greater practical currency." [11]

So, how does one transverse the roadblocks? In the physical world of geographical, political, economic, social and cultural borders, the model varies but its traces are evident. Fashion and cuisine are but two obvious disciplines whose inspiration crosses national boundaries. What interests me is the transitory stage which is temporary and possibly the most exciting. The stage when we are neither here nor there, when the fusion of ideas appears new and fresh and resistance in the form of revelations and actions from the unexpected, and in most cases, underestimated periphery dominate. In the virtual world of the internet where the body is absent, communication is mediated and the identities are constructed rather than experienced. The situation becomes more complex but models of activism, resistance and creative processes are present in both worlds.

... "Now let me ask you another question. What is the smallest world you would care to inhabit?" (L. Carol, 1889, *Sylvie and Bruno Concluded: The Man in the Moon*)

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PUBLIC DATA VISUALIZATION: DRAMATIZING ARCHITECTURE AND MAKING DATA VISIBLE

Dave Colangelo & Patricio Davila

In this paper, we explore emerging modes of digitally-mediated participation in urban space that engage bodily and architectural relationships with data rich environments. We contend that the combination of data visualization, public space, and digital display technologies represent an important aesthetic and technical challenge that engage new dimensions of presence in a social and material environment characterized by networks and data.



"Fig. 1. E-TOWER (tower view), Oct 2, 2010, Dave Colangelo and Patricio Davila, Installation.

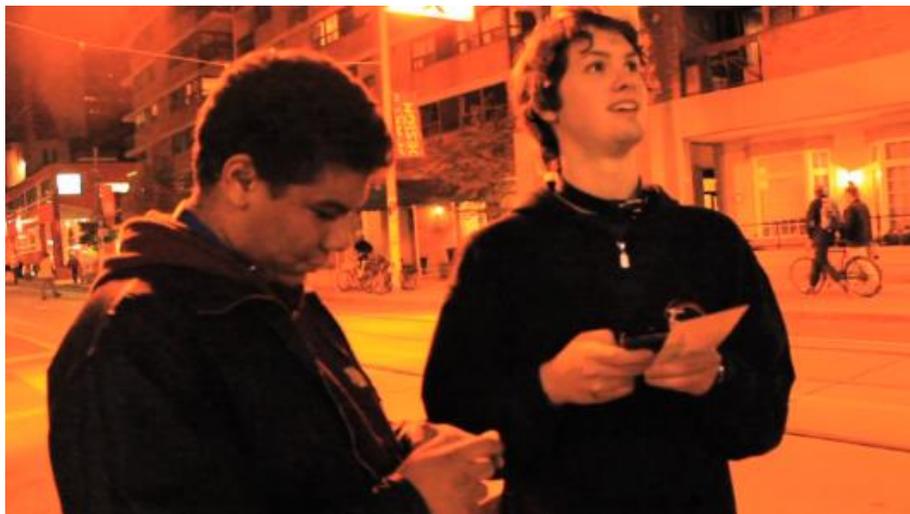


Fig. 2. E-TOWER (participant view), Oct 2, 2010, Dave Colangelo and Patricio Davila, Installation



Fig. 3. Archives of Ontario: Dramatizing the Archive (projection area), Dave Colangelo and Patricio Davila, Installation.

Introduction

In this paper, we explore emerging modes of digitally-mediated participation in urban space that engage bodily and architectural relationships with data rich environments. While briefly outlining each component – data and information visualization and collective engagement in public space – we will reflect on some of our recent work that aims to combine these components in order to test and develop techniques and theories of public data visualization. In particular we will focus on *E-TOWER* (2010), a visualization of Toronto’s “energy” on the city’s tallest structure, the CN Tower. [1] We will also reflect on a forthcoming large-scale interactive projection at the Archives of Ontario in Toronto that will enable participants to navigate through a digital image archive projected on the side of this building via voice recognition. Some examples from artists that have employed similar techniques such as Alfredo Jaar and Krzysztof Wodiczko will also be discussed as they relate to public data visualization. We contend that the combination of data visualization, public space, and digital display technologies represent an important aesthetic and technical challenge that engage new dimensions of presence for people, places, and things in a social and material environment characterized by networks and data.

A Fluid, Hybrid Space

The rhythms of the contemporary built environment at times feel slow in comparison to the frenetic oscillations of social practices mediated by information and digital infrastructures. The immaterial architectures, crowds, pathways and rest-stops of Facebook, YouTube, Second Life, and Tumblr, to name but a few, are frenetically populated and dramatized. But, of course, these sites are not limited to an engagement through desktop computers. Smart phones, networked screens, large digital public displays, and the many surfaces susceptible to a data projector’s beam allow for a link between concurrent and contingent on and offline spaces.

Large media facades, reactive and relational architecture, geo-tagging, and networked location-aware mobile devices present us with a potentially productive confluence; a fluid, digital layer [2] that permeates the city. This mix of technology and urban space creates an increasingly conflated real and virtual

space, a new hybrid space. [3] The confluence of the networked, fragmented publics of the Internet and the publics formed in the squares, roads, and shared spaces of our cities, now adorned by media facades, sensors, and mobile devices, presents us with an expanded presence for cultural engagement and self-reflection. As Scott McQuire points out:

... media-dense spaces, comprising a variety of platforms such as large screens, LED signage, wireless networks, and a growing range of interactive capabilities ... are the inheritors of the tradition of public space constituted by street life, city squares, cafes, and public cultural institutions. They have assumed the task of catering for those who are present at a moment when being present has assumed new dimensions. [4]

The hybrid layer constituted by the built form, data, and communications networks represents a productive assemblage upon which identity, knowledge, narrative, and experience can be explored and constructed.

E-TOWER

It is upon these theoretical foundations that we began, in early 2010, to design what was to become *E-TOWER*. Our goal with the project was to create an interface that would link the participants of Nuit Blanche 2010 with one another through the city's tallest structure, the CN Tower. We aimed to engage participants at this all-night art party in a cooperative, collaborative project that would allow them to visualize their cooperation – what we termed “energy” – via phone and data networks and reactive architecture. The CN Tower, already equipped with LEDs and a Light System Manager (LSM) – and not to mention 500m in height – was an ideal canvas. On the night of Nuit Blanche, from sunset to sunrise, over 5,000 participants across the city texted the word “energy” along with the additional text that was displayed on an *E-TOWER* Twitter feed. The lights on the tower were programmed to respond to the quantity and frequency of participation by changing from “cold” to “hot” colours, growing faster and brighter as “energy stages” were achieved, culminating in a pre-programmed light show at the end of each full colour cycle.

Information Visualization

Between data and its expression, between the text messages sent for *E-TOWER* and the lights on the CN Tower, lies the crucial function of data visualization.

Data visualization, or information visualization, is one response to the interpretive and representational challenges related to information excess. Recent advances in computation and increasingly ubiquitous networked data-gathering and storing processes and devices have produced an incredible surge of information available to users (both specialized researchers and general consumers). This phenomenon has the dual effect of producing a potential increase of control over the flow of information of users, objects, and environments as well as a potential decrease in real knowledge due to a glut of information.

By compressing vast amounts of data into shapes moving in time and space in order to extract meaningful information, visualization promises to give users greater access to phenomena that normally escape human detection due to invisibility, distance or scale. With *E-TOWER*, we attempted to measure, interpret and display something otherwise invisible – the “energy” of the city during its annual all-night art

party. Of course, where we decided to display it – the mapping function that occurs through a visualization operation – was of particular importance. Donna Cox suggests that visualizations are particularly powerful in how they recontextualize data. [5] For instance, when demographic data is placed on a visual representation of the city, source domain is mapped onto a target domain. Meaning is thus borrowed from one in order to create new meaning. Examples of this include thermographic imaging as part of energy efficiency analyses, heads-up displays (HUDs) that place navigational controls and contextual information on windshields (and by extension onto the environment in front of the vehicle) or on views of first-person-shooter (FPS) games. Visualizations, in this sense, bring together heterogeneous objects onto a common plane or field of view contextually relevant to the data.

Contextually relevant visualization was central to *E-TOWER*. The CN Tower is a symbol of the city of Toronto, a marker of civic pride, and thus the “energy” that we were looking for was both called forth and displayed by the tower, augmenting the significance and presence of the tower and the citizens of Toronto. *E-TOWER* mapped quantitative data onto architectural space, and by nature of its visibility, mapped this on to geographical space. Both the mapping of information onto geographically relevant space and the shared experience of interacting with a visualization in that space represent an important combination of participatory and meaning-making potentials that form the focus of our research into public data visualization. *E-TOWER* explored a way of experiencing the city that combined light, data, and architecture, and attempted to visualize the emotions, connections, and data that flow between users, objects and their hybrid environments.

Dramatizing Architecture / Making Data Visible

Alfredo Jaar’s *Lights in the City* (1999), presented as part of Mois De La Photo in Montreal, was an early and quite successful attempt at mixing data, light, architecture, and public space. Red lights were installed in the Cupola of the Marché Bonsecours, a landmark in old Montreal. Homeless shelters located within 500 yards of the Cupola were equipped with information about the installations. In each shelter, electronic buttons connected wirelessly to the red lights in the Cupola were installed. Every time a homeless person entered any one of the shelters they could push a button to engage the lights. The lights sent a sign to the city about the unacceptable condition of the homeless. At the same time, as the Cupola had suffered from fires in the past, the red light also represented the new and potentially more damaging threat to the city, that of its inability to care for all of its members. The data collected at the shelters and its representation on the cupola allowed for the experience of a presence with a human flow of people that have been historically marginalized and kept invisible. In terms of data visualization, here we have source domain and target domain combined: a demographic of the city was collected and displayed to the city by a symbol of the city.

Krzysztof Wodiczko’s works also conjure presence through the use of media and architecture. His tactics often respond explicitly to the architecture and involve mapping the human body onto a building. Wodiczko’s projections create a surrealistic collision between the image of a building or monument and the projected image. In this relationship, the built environment has figured as a central element of the final work as it brings forth its own social histories. For instance, Wodiczko’s *The St. Louis Projection* (2004) in which prisoners and victims of crime share their stories, was originally intended to be projected on a large-scale on the face of the St. Louis Historical Old Courthouse – the site of a landmark lawsuit against slavery in 1846. Due to last-minute controversy concerning the content of the project it was moved to a nearby library building in order to avoid embarrassment. This signals the potential for the social histories of buildings to be re-presented along with contemporary issues through visualizations and projections.

These examples serve to illustrate how presence can be explored through interactive symbolic representations and narrative forms. While Jaar's installation visually abstracted the movement of people in the city, Wodiczko's work literally places the bodies of people onto buildings. Both artists highlight, in very public ways, the stories and traces of people in the city and connect them back to place and the viewers located there.

Just as Jaar and Wodiczko seek to tell us about hidden aspects of historical events and present circumstances in public, Bruno Latour argues for an active and creative engagement with the flows and networks of people and things that are often concealed within objects including buildings and other environments. The goal for Latour is to make things public, to make spaces for critical reflection and engagement. [6]

We see public data visualization working toward the inclusion and interpretation of many flows and actors on the surface of a public structure. Associations between objects and humans as ongoing processes are represented such that the building upon which the visualization is projected assumes a kind of liveliness and complexity that juxtaposes the stable and concrete image of the structure with shifting and ephemeral flows of digital traces.

Archives of Ontario: Dramatizing the Archive

Following from these examples and our experience with *E-TOWER*, our next project, *Archives of Ontario: Dramatizing the Archive*, aims to create an interface with the searchable image database of the Archives of Ontario by projecting these images directly on to the building and allowing participants to access them through voice recognition. Pedestrians just outside of the building will be able to interact with the archive by speaking their search terms as they face the building. The unbroken interface afforded by voice recognition, the direct line of sight between the participant and structure, aims to address the discontinuities we found in the split interface of *E-TOWER* that required participants to interact first with their phones and then with the tower. Search terms will be captured and processed by voice recognition software that will allow participants to interact by speaking directly to the building. The results will be animated and projected on the side of the building. Search terms will be conjured by voice and emerge, when spoken, from behind a curtain, evoking the early practice of veiling sensitive photographs. Archive images will be pulled through the curtain by white-gloved hands. This refers to the procedural care that the staff at the archive take with each artifact that comes to the building. We hope that *Archives of Ontario: Dramatizing the Archive* will bring together archive, architecture, space, and audience in an expanded narrative and dialogue while animating, dramatizing, and connecting each in the process.

Public Data Visualization

It is our contention that art and design practice must take on the challenges of relating data, people, and space when being present includes living amidst ever-expanding digital archives and real-time data capturing capabilities. Our goal in considering data visualization and public space in the projects we have just described is to relate and make accessible a mixture of physical and virtual space, to create richer hybrid spaces that relate data, people, and things to one another in order to provide an opportunity for self-definition and self-understanding. *E-TOWER* attempted to do this by soliciting, visualizing, and mapping real-time data about the city's collective energy on a symbol of its collective energy. *Archives of Ontario: Dramatizing the Archive* will attempt to do this by moving the existing query and organization capabilities of the digital image archive to the surface of the building and creating an interface that will link

people, place, and data, dramatizing and extending each in the process. It is important for us that the associations between these entities are animated and related such that the building upon which the visualization is projected assumes a kind of liveliness and complexity that juxtaposes the stable and concrete image of the building with the data flows that increasingly define our always changing sense of personal and collective identity and architectural and spatial solidity.

Conclusion

Engaging people and public space through light, architecture, and data – mixing material and immaterial spatial regimes in order to explore the expanded presence afforded by the current interconnected state of media, communication, and public space – lies at the heart of our work in public data visualization. Although, as Liliana Bounegru reminds us, “technological mediated interaction in artistic environments ... may be seen as producing an aestheticization of human relations and thus mask and weaken the meaningfulness of their direct experience by their spectacular representation by overwhelming the senses,” [7] it can also afford, “opportunities for amplified consciousness of the self in relation to other beings in an intense sensorial, engaging way which goes beyond community and allows a more primary, more deep sense of human communion, a collective genesis afforded through technological mediation.” [8]

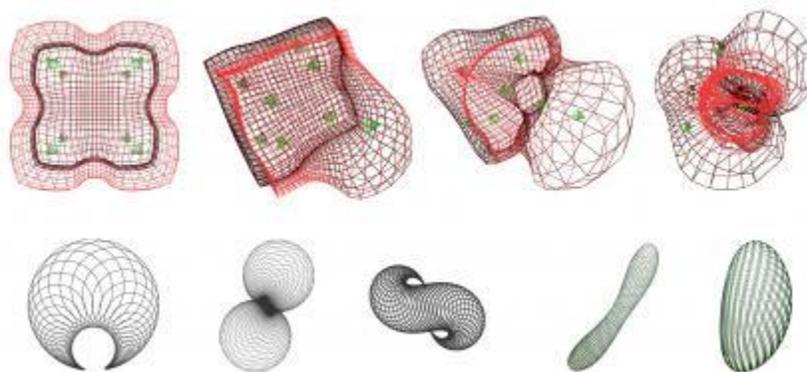
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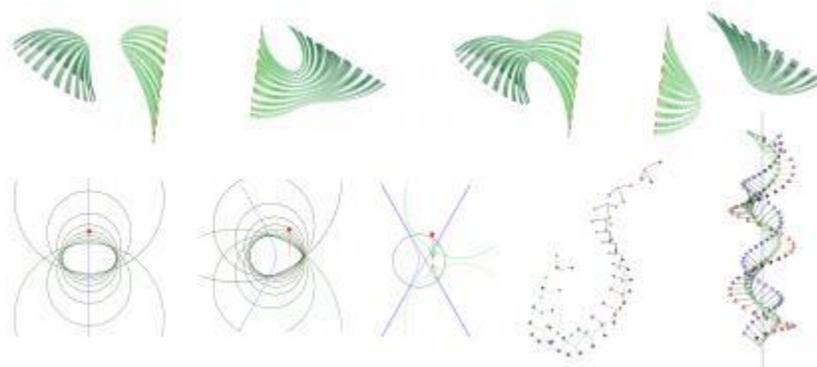
VERSOR: PROPOSAL FOR A SYSTEM OF ORGANIC CONSTRUCTIVISM

Pablo Colapinto

An introduction to the characteristics of conformal geometric algebra [CGA] is used to argue for its potential use in morphogenetic research and experimentation by digital artists. Figures included were generated using *Versor*, interactive software for generating organic forms and environments.



1. Above: The effect of a warp field on a lattice of points. Below: Some loxodromic transformations of a circle.



2. Above: Soap-bubble effect. A model of spontaneous surface generation through linear combinations of circles. Below Left: Some conformal transformations of a circle. Below Right: Motor generating twists.

sph	lin	dll	pln	dlp
				
flp	vec	biv	tri	drv
				
drb	drt	tnv	tnb	tnt
				

3. Table of elements and operators in 5 dimensional conformal geometric algebra. Three-letter codes are used for shorthand and represent the origin, infinity, point, point pair, circle, sphere, line, dual line, dual plane, flat point, vector, bivector, trivector, directions, tangents, rotors, translators, dilators, motors, and transversors.

In these pages, I introduce a little-known mathematical framework for spatial computing, and suggest its particular suitability for constructing developmental systems analogous to those studied in biological research. I do so here without the use of equations – for a more in depth look at the algebra the reader is referred to my master's thesis on the subject, [1] and the references found therein.

The accompanying images are selections of processes generated using computer software I develop called *Versor*. *Versor* is a free and open source C++ graphics-synthesis toolset for exploring new techniques in the manipulation and activation of virtual forms and dynamic environments. It implements conformal geometric algebra through an efficient and integrated multimedia platform, low-level enough for “serious” applications and high-level enough for “user friendly” functionality. Drawing from an excellent textbook by L. Dorst, D. Fontijne, and S. Mann, [2] *Versor* simplifies experimental exploration by putting some of the more exquisite features of CGA into the hands of digital practitioners, and can be used for both artistic and engineering-based design. Integrated with various dynamic solvers, a graphics user interface library (GLV) [3] and an audio synthesis library (Gamma), [4] *Versor*, can be compiled as a stand alone application or as an external library. It incorporates many compositional techniques for analysis and synthesis of dynamic forms and structures, some drawn from the CGA research landscape and some introduced for the first time, such as “Hyper Fluids”.

Versor aims to provide a basis for research requiring the visualization of complex multidimensional fields such quantum electrodynamic phase spaces, gauge theories, lorentz fields, spacetime curvature tensors, and morphogenetics. Potential artistic and engineering uses include live performances, immersive environments, multimodal interfaces, molecular modeling and crystallography, morphological studies, hyperbolic geometry, and dynamic physics simulations. Its future development is suggested by the examination that follows – namely, the construction of an operational network for simulated ontogenetic processes.

Background

Geometric algebra [GA] is a mathematical system of combinatoric spatial logic based on William Clifford’s hypercomplex algebras of the 19th century. With it, synthetic geometric concepts such as circles

and lines can become variables in an equation. The algebra allows one to use ratios of these geometric entities to construct analytical operations such as rotations or twists. More advanced concepts quickly emerge from this holistic and scalable combination of synthetic and analytic geometries.

A long-awaited fulfillment of “common sense” spatial relationships, GA integrates various methods for modeling and engineering dynamic systems. Applications exist in computer vision and graphics, neural nets, DSP, robotics, optics, particle and relativistic physics, and metamaterials research. The now classic work by the physicist David Hestenes, *New Foundations for Classical Mechanics* (1986) demonstrates the compactness of the math, [5] while the most recent text by cyberneticist Eduardo Bayro-Corrochano, *Geometric Computing: For Wavelet Transforms, Robot Vision, Learning, Control and Action* (2010), demonstrates the expressivity of its powers for geometric reasoning. [6] Many other authors make a similar case: geometric algebras encapsulate many other mathematical systems (through *isomorphisms*) and solutions worked out in smaller dimensions can often be extrapolated to higher dimensions (through *outermorphisms*). It is an expressive logic of spatial relationship, which allows intuitive mathematical experimentation across a widening range of disciplines.

Visible use of geometric algebra in spatial computing has grown with the introduction of a model for generalized homogenous coordinates. Based on Riemannian projection onto a hypersphere, physicists developed a conformal mapping of 3-dimensional Euclidean space onto a 5-dimensional Minkowskian sum. Introduced into the geometric algebra community by Hongbo Li, Alan Rockwood, and David Hestenes in 2001, [7] this conformal model enables algebraic manipulation of direct geometric entities – lines, planes, circles, spheres – as well as their dual representations and even more subtle concepts – surface tangents, tangent spaces, hyperplanes, and space-time boosts. It provides mechanisms for describing closed form (i.e. exact) solutions within Euclidean, spherical, and hyperbolic geometries, and unprecedented control over the synthesis of parametric forms. Still, the use of conformal geometric algebra for exploration in graphic modelling remains a relatively esoteric exercise in the larger scientific and artistic community. As a result, many of its formal characteristics and exotic morphological powers have yet to be fully explored.

Axiom and Organism

At the core of the mathematical system is the almost promethean enfranchisement of geometric primitives. Points, lines, planes, circles, and spheres can now operate on each other to create other entities. Three basic operators are defined – geometric product, wedge (outer product), and contraction (inner product) – as are three modifiers – reversion, involution, and conjugation. Elements can be modified to produce their inverse, thus providing a means for division. For instance, any element can be divided by the space it is in (referred to as the tangent space) to produce a dual representation of itself, which can be used in marvelous ways. For instance, a dual plane can be wedged together with a dual sphere to produce a dual circle – defining the meet between the plane and the sphere, or in other words, revealing the circle the plane cuts through the sphere.

All this is done algebraically, which means we can make computers do it. This is no small feat, for it endows computers with a rigorous toolset for deductive reasoning about space. And beyond introducing a cornucopia of different geometric elements representable as variables in an equation, this algebraic model of space simplifies and generalizes calculations of all general rigid body movements within Euclidean and non-Euclidean spaces. Conformal geometric algebra opens the door to a rich set of transforma-

tions previously unexplored visually and typically closed to artistic experimentation. These transformational operators are called 'versors.' They allow for reflections, rotations, translations, dilations, motor twists, and transversion boosts around, along and across round and flat elements.

This powerful fusion of deductive reasoning with analytical techniques is an irresistible invitation to revisit the most confounding and particular shape-making and shape-changing processes known to date: the evolution (phylogeny) and growth (ontogeny) of living organisms. Indeed, beyond its logical formalism, conformal geometric algebra exhibits certain characteristics, which mark it as a peculiarly organic.

Combinatorics and Hypercomplexity

Geometric algebras rely upon a combinatoric system to generate a hypercomplex graded algebra of multivectors. These sparse matrices of mixed dimensionality are ultimately what represent our transformational operators and geometric primitives. Hypercomplexity here refers to the fact that there multiple imaginary numbers involved in the system. That is the concept of multidimensional hypercomplex numbers should not be confused with the concept of complex or nonlinear behaviors which exhibit emergent properties, except in so far as they can be more easily be used to generate such behaviors algorithmically. Here, I should note an intriguing set of articles written by C. Muses in the late 1970's which point to hypercomplex numbers as having a unique use in modeling biological systems. Published under the auspices of the mobile and mysterious "Research Centre for Mathematics and Morphology," Muses' articles – such as the 1979 *Computing in the Bio-Sciences with Hypernumbers: A Survey* – are filled with parametric lobes and coils and argue for the specialized use of imaginary numbers in the study of biological form.

Point and Process

The mechanics of the conformal model begins with the definition of a null vector – a point in space which has no magnitude. Using Hermann Grassman's algebra of extensions, it builds up larger dimensional objects such as point pairs, circles, and spheres. These round elements of the algebra serve as both operators and objects in a consistent and predictable way. One can construct a continuously differentiable perturbation operator from a pair of points that is itself perturbed by another operator. This greatly simplifies dynamic simulations by providing a linear approach to creating higher order phenomena. Since there is no real difference, in the computer's memory, between a point in space and a process in space, the representation of space itself gains a certain parameterizable agency. For instance, the construction of self-organizing tangent spaces is possible, creating a whirlwind of subspaces within it: a spatial configuration of configuration spaces.

Twist and Boost

The plethora of round elements created by combinatorics would by itself provide a rather glib organicity were it, not for the particular elegance of the operations allowed. Given a line in space, we can twist any multivector (geometric element) around it. Given a point in space, we can accelerate any multivector into it or away from it. These transformations describe rich movements in space that can be easily compounded. The versors form a closed *automorphic* group, such that multiplying them together will return another member of the group. This powerful structure allows for transformations to be concatenated

through multiplication as is done in matrix algebra. The complete set of Euclidean and conformal transformations are possible with the versor construction: inversions, translations, rotations, screw motions, dilations, and transversions. By constructing an operational network of transformational effects, bilious and twisty forms are easily generated. Spaces can be cinched, pinched, blown out, twirled, twisted, or torn into and out of real and imaginary radii.

Morphisms and Hybridity

Tensor, vector, and matrix algebras are all embedded in geometric algebra through characteristics shared with group theory and lie algebras. A variety of mathematical species such as complex numbers, Plücker coordinates, Dirac and Pauli Matrices, and the symmetries of various particles as described by lie groups and their algebras have been shown to be isomorphic to, and easily represented by, various metrics of geometric algebra. These isomorphisms are critical to cross-fertilization across different fields of science, bridging gaps between physicists and biologists, for instance. The algebra also has outermorphic properties: discoveries made with simpler elements in lower dimensions can often be generalized to higher dimensions. The logic is designed to be extrapolated meaningfully, and the outermorphic properties of the algebra allow for this. This helps in building intuition and experimenting with algorithms across dimensions.

Orientation and Polarity

A critical component of the algebra is its asymmetric anticommutivity, for this fuels its orientability. Circles are not just circles, but they have an inherent direction (clockwise or anticlockwise). Spheres likewise have an inherent spin, as do lines a direction. The orientability of the algebra is useful for describing chiralities or “handedness”. This sensitivity to the polarity of forms is also found in the molecules of living organisms.

What these analogous characteristics point to is the suggestion that if any mathematical system is appropriate for modeling characteristics found in living organisms, it is some flavor of geometric algebra. What, then, is proposed here is the use of these grammar-of-forms in the design of an ontogenic processor: a simulated developmental system. Ontogeny is the trajectory of an individual organism's morphogenetic developments, from seed to maturation and death. Phylogeny is the evolution of ontogeny over generations. Embedding the GA grammar into a functional framework of emergent causal structures could be a first step towards a phylogenic-ontogenic computer.

What is currently missing is a sort of statistical memory. In a computer we are forced to use memory in ways that it is never used in biology, so it is important to set a few internal boundaries for this task. It is not the proposed goal to envision a geometry that can correctly model any particular specimen. This limitation is set to avoid answering the question of how real life forms grow, the mechanics of which are best described by biologists. Similarly, it is not the intention to reflect a model of life back onto actual life in a particular way – that is, to make a specific statement about living things that would be better phrased by philosophers.

Rather, the primary goals are artistic: an aesthetics of movement, a self-organizing differentiation of forms and tangent spaces, a furnishing of lifelike qualities into a geometric system, the further enfran-

chisement of uncertain spatial concepts, the development of new relations. Developmental analysis remains one of the most mysterious biological processes, and I doubt we will ever fully simulate the growth of a seed in computer memory. We might, however, be able to do justice to a dream of adaptation and growth: to generate a network of spatial relations complex enough to grow *something*. Then, precisely where and how the computer's analogies fail to illuminate actual biological processes could prove fruitful in both biological and philosophical trains of thought.

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DISSEMINATING KNOWLEDGE OF ELECTRONIC TEXTILES AT ART SCHOOLS AND UNIVERSITIES

MELISSA COLEMAN, MICHEL PEETERS, VALÉRIE LAMONTAGNE, LINDA WORBIN & MARINA TOETERS

This paper aims to give an impression of how knowledge of e-textiles is shared in art schools and universities. With this paper, we intend to create a context for future reflections on e-textiles education and knowledge dissemination for educators in this field. We hope to stimulate knowledge sharing on e-textiles between institutes and with the e-textiles community at large by identifying opportunities for open learning.



Students present their semester project. Copyright Wearable Senses, Industrial Design, Technical University of Eindhoven, The Netherlands

The context of e-textiles education

The field of electronic textiles is multi-disciplinary and operates at the intersections of textile and fashion design, industrial design, furniture design, computer science, interaction design, and media art. The students who are taught in this field are diverse and possess a skill set associated with their future work field. When students create electronic textiles in higher education, they are primarily judged by the quality standards of their specific field of study. Consequently there are many ways to teach this subject.

Although end-goal requirements of students differ, the skill set that is necessary to create an electronic textile is the same. Students need to have a basic understanding of the textile technique and electronics

they intend to work with and to know how to tackle integration issues. This common ground in e-textiles education indicates that there may be opportunities for dissemination of knowledge that transcend the boundaries of the disciplines. We believe that this kind of dissemination is possible through the sharing of educational artifacts, i.e. all media that are produced for and through educational contexts.

In the following sections we will give insight into e-textiles education at five art schools and universities. At the end of each chapter we will highlight the educational artifacts that are in use at the institute.

Wearable Senses at the faculty of Industrial Design (ID), Eindhoven University of Technology (TU/e)

Three years ago, the theme Wearable Senses (WS) was set up, applying the mission statement of the ID department, with a unique focus on those intelligent interactive products, systems, and services that are close, near, or on the body. In the course of time, the theme has been expanded with a textile electronics workshop and a material library with high-end innovative textile and electronic materials. Wearable Senses have a strong network of industry partners (regional, national, and international) and in this way receives support on different levels from both the textile and the electronics world. The main application areas of the theme are expressive clothing and accessories, sports garments, interior textiles and interesting deviations.

Within the theme, students work in close collaboration with the WS-staff and are considered as junior employees, actively contributing to the development of the theme's vision, identity, knowledge, methods, skills and tools. Each semester, bachelor and master students work alongside each other on various educational activities. One of these educational activities is the intelligent textiles module. This is a one-week course in the ID master in which multiple design crossovers are being made between textiles and electronics, using or in search of what we at Wearable Senses like to call 'boundary objects'. [1]

In the module around twenty students systematically explore the aesthetic quality and potential of textile electronics with a hands-on approach. The students design and create textile electronics interactions or effects. These designs take the form of interactive textile samples, which are sensitive to certain stimuli, smart or intelligent, and contain expression.

During the module, students work in groups of three to four people. On the first day, each group works on a different technique: 1) weaving, 2) knitting, 3) embroidery, 4) cut/overlock/sew/heat press, 5) laser cutting/3D printing. Day one ends with presenting samples to each other and explaining opportunities for design of each separate technique. After day one, there are five 'technique expert' groups, each containing four students. On the second day, students rotate and new 'hybrid technique' groups are formed. Day two, having the same assignment as day one, ends with presenting 'hybrid samples' to each other, and explaining opportunities for design by combining two techniques. On days three to five, the student groups are given the assignment of systematically exploring the combination of techniques, and successively creating a textile electronics interaction or effect. The module concludes with a demo of the final results.

Educational Artifacts: physical e-textile samples, previous student projects on display, presentation boards (A3 size with working textile mockups and annotations), digital documentation of circuits and textile techniques, tools and skills in video explaining design steps, construction, materials and electronics specs. At ID we call this specific video capturing environment, in which students document their work, the 'Library of Skills'. [2]

Electronic Textiles at the Royal Academy of Art, The Hague

Electronic Textiles are taught at the Royal Academy of Art in The Hague (KABK) as part of the Introductory Courses, which are classes designed to give students basic skills in technical subjects that are not covered in the regular course program. Students have often undergone at least one year of study as the courses are intended for specialization after acquiring basic knowledge in one's field.

The course Electronic Textiles introduces students to the field of e-textile design over the course of seven lessons of three hours each. The emphasis of this course is on the aesthetical design and integration of electronics in textiles. Students are taught both textile techniques and simple electronic circuits through the creation of e-textile samples. The course buildup comprises a series of short workshops to acquire skills and produce a volume of e-textile samples, an individual project, and lectures that place e-textile design in a social and cultural context.

Students are first introduced to a basic principle of textile design: building a material through the repetition of a pattern. They are shown an overview of textile techniques that can be repeated ad infinitum and are challenged to make modular textile electronics using a textile, a LED, conductive thread and a soft button. This is called an e-textile building block. Over the course of the first and second lessons the e-textile building block is used in a pattern where nine LEDs are connected in a parallel circuit. The third lesson introduces movement in textiles by using a small motor in a pattern, where a moving component breaks the repetition. The fourth lesson focuses on felting raw wool with electroluminescent wire, exemplifying the inclusion of electronics in a textile and creating a new material. The fifth lesson teaches students screen-printing with thermochromic ink and controlling color change through resistive heating. The last two lessons are reserved for an individual project: a high quality sample with sketches and a presentation explaining the intended use for the material. The learning goal of this assignment is for students to implement their newly acquired knowledge in a product that fits into the context of their field of study.

Educational Artifacts: physical e-textile samples, lecture slides and digital documentation of circuits and textile techniques, project documentation.

Department of Design & Computation Arts at Concordia University Montréal

The Department of Design & Computation Arts is part of the Faculty of Fine Arts at Concordia University in Montréal. Students in Computation Arts are taught a broad spectrum of media from motion graphics, 3D software, physical computing, sound design, video editing, graphic design and interactive arts through to performance media. In combination with the arts curriculum, students take programming classes, which are taught both within Computation Arts and in Computer Science. The undergraduate program is a 4-year course program. Students have core classes (design, networked culture, basic programming) and electives, which permit them to choose a direction (physical computing vs. 3D modeling vs. motion graphics). The Computation Arts program has the goal to form designer/artists who can work both commercially and independently. The focus is on creating meaningful, artistic products, which respond to today's cultural climate.

There is a strong emphasis on self-learning with a series of inspirational technical workshops, which are complemented by a number of physical resources available to students. The Computation Lab is a resource center where students can get help with various programming languages. The Sense Lab is a

physical computing lab, which is equipped with e-textiles equipment such as sewing machines, embroidery machines, and soldering and circuit-making tools. There are full time technicians in both labs to help students with their projects.

Students have access to one specific wearables class, Second Skin, usually taught by Joanna Berzowska from XS Labs. However, they are encouraged to explore body-interfaces in other classes (i.e. wearable controls and physical computing / installation projects utilizing e-textiles). Open design practices are encouraged via a number of online and in-situ didactic platforms. Class instructors and students make use of online forums to share information and techniques. Student projects are documented and posted online. Hands-on exchanges are encouraged in open lab contexts. Collaborative projects are also encouraged in order to foster better communication and project development. Computation Arts holds both end-of-the-year and open studio class events. Within the context of these events, students are encouraged to showcase gallery-ready projects, which are technically and aesthetically resolved and accessible to a wide-range public.

Educational Artifacts: a wide range of online resources and online project documentation.

The Smart Textile Design Lab at the Swedish School of Textiles at the University College of Borås

In 2008 the Smart Textile Design Lab (STDL) [3] was initiated as part of the research initiative Smart Textiles at The Swedish School of Textiles funded by Vinnova. [4] The lab focuses mainly on experimental design research. There are three overall themes in the STDL: textile sound design, textile interaction design and dynamic textile patterns. This is an important foundation for the integration of electronic textiles in our education.

The researchers, post-doc, doctoral candidates, and master students in textile design have a shared environment, with individual workspaces, but with a joint meeting and working areas. Other meeting places are the Material Library and the weekly Design Seminars, where both smart textiles/electronic textiles and more traditional approaches to the textile field are covered. The lab has research collaborations with the national textile industry, producing interior and technical textiles, and has collaborations with the transport industry and a furniture producer amongst others. Researchers and doctoral candidates supervise students in individual projects as well as in joint collaborations with and without industrial partners.

The lab has integrated its research topics with existing basic courses in the textile design education to widen the perspectives in the three main textile techniques that are taught: weaving, knitting, and printing. In the basic weaving course optical fibers will be introduced in the near future and the weaving class is being extended with workshops on light as a design material. The notion of dynamic textile patterns [5] has also been added by printing with thermochromic (TC) ink in the basic classes, which naturally brings in conductive materials as both a heat source and to exemplify a new design variable in textile design.

Master students attend basic textile courses where necessary; later they are given more individual hands-on supervision and support for their own design projects. Regarding electronics, workshops have been given in topics such as integrating LEDs in woven structures (including how to build a simple circuit

with a resistor, light, and energy source), stretch sensors and buttons, and how to connect a textile material to a computer program and control it. The Smart Textile Design Lab organizes its own workshops and invites external experts to teach.

In the STDL there is an ongoing project called Smart Textile Sample Collection where textiles are developed by the meter to be used in joint projects with industry (e.g. the Recurring Patterns [6] project) as well as during workshops. For example, one material was developed for a dynamic textile pattern workshop using thermochromic ink; this textile was plugged into a system where students and designers could control heat sections from a program and change the textile's color.

An important aim of the STDL is to teach students the basics of electronics and programming and provide them with a vocabulary that allows them to communicate with other professionals such as electrical engineers and programmers. A Digital Fika [7] (translation: digital coffee), an informal meeting/coffee break combining basic hands-on demos with discussions, starting with how to use a multimeter, reading textile sensory data and controlling inputs and outputs to create a textile expression, has been introduced in this regard.

Educational Artifacts: Smart Textile Sample Collection and Material Library.

Technology and Ecology at the fashion design department at Utrecht School of the Arts

Design education is 'based on social idealism.' [8] This certainly applies to the education of fashion students in Utrecht, who are taught to think from a social perspective. In designing they consider the consumer's point of view, how the consumer emotionally adapts to the world through positive aesthetics, and how to place design in a contemporary context. Historically the fashion industry has stretched people's minds by seducing them to stay ahead of the curve by consuming 'newness', thus achieving wide social acceptance for new concepts in clothing. Looking at consumers' attitudes toward innovation, it seems that they want clothing conceived by fashion designers and not by technicians. This implies that fashion designers and fashion design education must get involved in new technological developments.

To aid this development, the class Technology and Ecology is taught at the Utrecht School of Arts to second year fashion design students. The aim of this course is to inform students about what innovations are, or soon will be, available in the textile and fashion industry, to inspire them to explore and integrate innovations in their design process and to give students tools to easily communicate and collaborate with technicians. Technology and Ecology is an 8-week course of two hours per week. The main focus of these lessons is the interaction between fashion, technology and innovation and how this contributes to a more sustainable environment. The course poses questions like: Which functionalities can technology add to clothing and to what purpose? And how can fashion designers design for the future?

Five lectures introduce students to past, present and future innovations in fashion to help them develop their vision on design innovation. The lectures cover innovative design, adoption issues of technology, critical reflection on fashion and innovation, ecological issues and experimental tools. 1) Introduction to by-wire.net and 200 visuals of innovative projects 2) Innovations in the production process of textile and garment fabrication 3) Recycling & cradle to cradle [9] 4) Old vs. new textile 5) Wearable electronics.

During the first lecture students are exposed to innovations ranging from garments of Inuits, who made animal skins flexible so that their people could move to colder environments, to contemporary examples

of self-growing textiles, sensory active protectors and moving garments. Students then choose three examples to explore through literature and online documentation, resulting in a short report discussing the technology/ecology aspect of projects, the projects' participants, the users, and the added value for consumers. After these lectures, students choose one subject and start an individual artistic research on materials, technology, ecology, and function inspired by innovative projects from the by-wire.net library. [10] They conclude their research in a communicative and conceptual item of clothing. Students present their research and prototypes to their peers.

Educational Artifacts: the digital project documentation in the by-wire.net library, lecture slides and physical e-textile garments.

Discussion

In summary, knowledge dissemination of e-textiles in the five institutes presented here takes place mainly through the educational program by overlapping education and research, sharing student work in class, by presenting work of students in the institute, and by organizing events with specialists. Many of the educational artifacts we have discussed in this paper are unavailable outside the walls of the institute, even though they have the potential to extend further. Contributing to open learning, as a counterpart of open design, is currently not actively pursued, as it is not part of the core activities of educational institutes. This raises the question if institutional contribution to open learning benefits institutes.

If educators want to contribute to open learning, the most effective way would be to share educational artifacts online. Looking at the institutes discussed in this paper, there are many artifacts, such as lecture slides, lists of online lectures/articles/blogs, students' project reports, technical schemas for electronics and textiles and the Library of Skills, which are already of a digital nature and are therefore highly suitable for sharing. Other artifacts, such as materials, samples, and finished prototypes, are of a physical nature and would need to be digitized if they are to be shared online. Research is needed into the best methods for digitizing. Besides sharing artifacts, educators may also consider transforming their educational artifacts into textbooks (e.g. Open Softwear) [11] or online courses. In the future we hope to see more knowledge sharing on e-textiles by educational institutes. Through sharing educational artifacts we have the opportunity to teach and inspire the entire international e-textiles education community and beyond.

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LOCOMOTOART: INTERACTING WITHIN NATURAL SETTING THROUGH PERFORMANCE USING PICO PROJECTION

LAURA LEE COLES & PHILIPPE PASQUIER

LocoMotoArt is a creative field backpack that gives the user the capacity to explore and make digital art from, and in, the natural environment. Liquid Crystal on Silicon pico projection technology was studied during the production of two live technology-mediated experiments on the island of Hawai'i. We question whether different experiences of technology in nature can subvert preconceived notions of the human-nature-technology relationship.

Power

- OP-26 12V SLA battery pack 25Ahr 150Whr. with dual regulated inputs and triple outlet hub with meter
- Flexible roll up portable solar panel 55.4W 3600mA with 12V female CLA socket outlet
- 12V male cable, 12V DC 100W Mag Safe adapter for an Apple 15 inch Mac Book Pro laptop computer to power through the OP-26 battery
- 12V USB Port adaptor. for iPods, iPhones and other USB devices
- MH-C40-1FS-DC and AA AAA battery chargers

Capture

- H2 Zoom field sound recorder
- Canon Vixia HF R100 AVCHD mini camcorder Canon SLR digital camera

Production

- Apple 15" Mac Book Pro with Final Cut Pro, Adobe CS5, Adobe LightRoom 3, Aperture, Processing, Toast Titanium, DVD Studio Pro, iTunes, and Garage Band pre-installed

Playback & Display

- Three Aaxxa LCoS P1 Jr. pico projectors; 10 ANSI-lumens, <20dB 0.5w mono speaker, SD-HC card reader, mini USB, and composite A/V, 4:3 aspect ratio control, 10 ~ 50 inches projection image.
- Apple iPod, one Tunebug Portable SurfaceSound™ speaker where sound waves pass through the surface it rests on, and two Diamond Mini Rocker 4 Watt 40hm computer speakers with standard 3.5mm audio plug.

Figure 1. LocoMotoArt system components for backpack



Figure 2. (a) Kaumana Cave, (b) Coastal Forest Performance Site, (c) "Hand of Fate"; Cave Experiment. Photographs by Laura Lee Coles.

Introduction

The LocoMotoArt field system has four capacities: independent power, capture of sound and visual media, laptop for production and Liquid Crystal on Silicon (LCoS) pico projection technology for visual display in a natural setting. Various interactive components such as Wii controls and Xbox Kinect complement the system.

We define nature as the realm of the non-human made world. We refer to technology as this human made digital devices that comprise the LocoMotoArt system detailed herein. It is our position that much of the digital technology currently used by humans (mobile phones, GPS, electronic books, portable pads and pods, and computers) are more than appliances because “we experience them.” Digital artifacts “are now part of our world as much as trees, animals, and other manifestations of nature”. [1]

In his book “Spell of the Sensuous - Perception and Language in a More-Than-Human World,” environmental philosopher David Abram postulated that Westerners are disconnected from the natural world, partially due to the intensiveness of interaction between humans and technology. According to Abram, humans still have the chance to re-connect to the magic and sensuous phenomena of the natural world within which “our technologies are rooted,” because the implication of our symbiosis to technology does not make it necessary to “renounce our complex technologies.” [2]

Through the use of LCoS pico projection in outdoor natural settings, our initial research seeks to provide insight in the area of mobile projection as a method to inquire our lost connection to nature that Abram posits. We question how the human experience of the non-mediated sensorial awareness of the natural world can be perceived and possibly changed through the experience of using digital mobile projection technology in outdoor settings. We further question whether values, behaviors or preconceived notions of nature and the use of technology can be changed through the user experience when placed in the context of a natural setting. What is the change, if any, and what caused it? To facilitate the study, two artists on the Big Island of Hawai’i were provided with LocoMotoArt for a period of ten-days.

Related Work

While some artists are using projection in nature, most of the research on mobile projection has been limited to indoor laboratory environments or urban settings. [3] They studied users in multiple environments such as a train station, bars, public transport, a museum, and shared public spaces during a three-day trip in Lancaster (UK). The scenarios tested included map interaction, media browsing, and projection onto alternative surfaces such as a wall, or the roof of a public bus. Vlahakis et al. [4] developed an augmented reality system users can wear to access visual and historical information regarding a specific ancient ruin while on site. We note that there is limited research on outdoor use of pico projection specifically in artistic practices in the natural landscape.

System Overview

LocoMotoArt is a creative field system that provides the capacity to the user to make digital art from and in the natural environment. All digital devices for LocoMotoArt are transported in a standard backpack. The system weighs 20 pounds without the portable battery pack and 40 pounds when users

choose to include the portable 12V SLA battery. The components for the backpack system are listed in Figure 1.

Despite the very low lumen capacity, the Aaxxa P1 Jr. pico projector was specifically chosen for this project because of the multiple features in relation to its affordability. The unit is quite small which is ideal for using as wearable projection. The LocoMotoArt user, therefore, may use the Aaxxa P1 Jr. for small scène graphic lighting design or exhibition of photography using the slide show feature. The Tunebug was chosen because it is compact and can turn any surface can become a playback source.

Detail of Study

The research during this small-scale pilot study employed interpretive ethnography, participation observation methods and incorporated field notes, photographic and video documentation. Norman K. Denzin, [5] citing Abram, defines his vision of interpretive ethnography as that which “...seeks to ground the self in a sense of the sacred, to dialogically connect the ethical, respectful self to nature and the worldly environment.”

Background of Study Participants

Anne F. Bunker, choreographer and director of OTO Dance, a multi-media aerial dance company and partner, musician and multi-media designer, Gerald Chuck Koesters participated in the initial research study. The artists have expertise through their combined extensive professional background in lighting, performance and sound.

The spectators studied consisted of two nineteen year old males. Unexpectedly, one spectator indicated that he was purposefully educated at a private school that emphasized a non-digital school environment, in which the use of computers, cell phones, Internet and e-mailing was absent. His current use of digital devices is extremely limited. He indicated that he uses an electric typewriter instead of a computer and a cell phone ten minutes per day. Unlike the non-digital user, the second male’s digital technology use had been closely monitored by his parents. He is currently a user of digital technology. He stated he uses the computer, e-mail, Internet, cell phone, and social networking on a daily basis.

Pre Interviews and Biases

When asked if they thought that humans could use digital technology to experience a connective sense to nature, the participants from both groups voiced skepticism. No one believed that they would be able to recognize a personal connection between their use of digital technology and the sensorial realm of nature because nature is so “unique” and “special” while technology is separate and apart from nature. One artist and the non-digital user spectator indicated that digital tools were “annoyances” and “disruptive” of the human condition.

Unexpectedly, the non-digital user spectator stated that digital technology made him feel “angry” because “people use them over human contact”. However, the other artist and other spectator stated that they used digital technology on a regular basis and considered digital technology a positive influence on human factors, but emphasized that the digital artifacts should be used with restraint rather than “take over” a person’s life.

All of the participants claimed not to have addictive tendencies towards digital technology. All participants indicated they have existing personal attunements to natural settings, through hiking, camping, and trekking.

Field Work

The artists used LocoMotoArt in a lava field, near the ocean, inside a lava tube cave, a grove of trees near a swimming area, and a forest on the Big Island Hawai'i.

The artists chose to stage a live technology mediated performance in a forested area at the end of a road near the coastline of South Hilo, commonly used by local fishermen. The performance took place at nightfall so the projections would not be washed out by light. Koesters used photographs taken during previous field excursions. Koesters manipulated the images using High Dynamic Range techniques for image processing. Additionally, natural ambient sounds such as the pulse of ocean waves crashing upon the lava rocks and the Coqui frogs' robust chorus of chirp song were incorporated into the soundscape.

An additional soundtrack from Koesters' footage of Kilauea volcano eruptions played on the mono speaker of the LCoS projector as a hissing crackling sound. During the performance, a light misty rain fell.

The second site, Kaumana Cave, is situated in the foothills above Hilo, Hawaii. The cave is a lava tube that was created when the volcano Mauna Loa erupted in 1880. This site was chosen for a brief exploration of sound and video using pico projectors because it is a dense and dark environment. It had no echo, and there was water dripping from above.

Results Coastal Forest Performance

Live dulcimer and recorded original music compositions were played using a Tunebug Portable Surface-Sound™ Speaker and an iPod. Koesters also introduced a Roland COSM battery operated amplified speaker into the LocoMotoArt system.

Bunker and Koesters handheld or fixed the projectors onto their wrists. Bunker moved the images along the tree trunks and canopy of trees, onto rocks, and the ground. Bunker used two projectors and layered projected images simultaneously in a collage effect. Koesters was lying on the ground, hidden in the darkness, projecting video footage of Kilauea's volcanic lava flow onto Bunker's moving white clad figure as if she was a human projection screen. She would occasionally shut off the projectors, retreat under a large black cloth, move unnoticed to another location of the forest, drop the cloth and start the projectors again. This imagery gave an impression of a ghost or spirit moving about the forest. This uncertainty of when or where the entity would appear again portrayed a body without identity.

Limitations in the brightness of the projectors and sound playback were overcome because the spectators shared an intimate proximity to the artists, which became an immersed stage setting.

Results Kaumana Cave Experiments

Bunker positioned one of the projectors overhead at an arms-length and pointed it at an angle. She projected images and video footage onto her hand. The scene was observed as a hand or entity suspended

in space, moving, existing otherworldly and spectral. The projected visual content got combined with the material textures of the natural environment when Bunker moved the projectors along the wall, floor, and ceiling of the cave. Content became form. Like the camera, the relationship of LCoS pico projector to the body operated as a prosthetic extension and provided the user with an enhanced extension of self. In this embodied experience, Bunker transformed self as theatrical apparatus.

Overview of Post Interviews

Artist-bias prevailed early in the use of LocoMotoArt. However, through their use of mobile projectors during the performance, the artists became more engaged as they discovered that the technology offered new ways of seeing and understanding their art practice, both temporally and corporeally.

The artists also indicated that they were amazed by a new sensorial awareness to “place, time, and body movement”. Both artists remarked that pico projectors worked like “mini-gobo stage lighting” effects and would be fun to use in costuming. The artists also indicated they felt a closer connection to nature when they used technology in a natural setting. Koesters: "I had doubts at the start of this project and was surprised how well it worked to tell the truth. As a performer, there were moments I felt completely connected to the environment, Anne [Bunker] and the technology. All those things came together in a surprising way." Bunker: “Space was altered when shining the projectors up and down the trunks of the trees and into the canopy, it flattened out the canopy, became two dimensional, a very different kind of surface. I was able to carve space with the projections and move space around in the darkness which was interesting.”

Spectator Experience Forest Performance

The spectators both conveyed marked changed notions from their pre-interview positions, specifically the non-digital user. When asked to comment on the event and the spectator experience, the responses were as follows: Spectator non-digital user commented, "Peaceful, nice." Spectator digital user: "I don't know, I saw a stage, really that is what it was." When asked whether the technology detracted from their sense of nature. Spectator non-digital user: "No made you notice it more, I don't think I would have sat there in the trees in the dark without that going on. Not really sure, kind of why it appealed to me, not exactly sure what I got from it physically." Spectator digital user: "When I saw it, I didn't think digital technology. It did not separate itself from the environment, which was nice. It was a very symbiotic relationship."

Conclusion and Future Research

Despite the initial biases and skepticism of the artists and the spectators, both study groups indicated a new appreciation of digital technology as a means in sensing interconnectivity to raw nature and natural settings. Because of the change in attitudinal perspective, these initial results indicate that the hypothesis that digital technology may serve as unexpected sensorial pathway to interact with nature warrants further research. Although small in scale, our study gives insight that may be of importance in the study of locative mobile projection because it assists in understanding the human relationship to digital technology which consequently informs their design.

Future research includes the study of the LocoMotoArt enhanced field power system, which operates higher powered electronic equipment. This portion of our study includes both artists of soundscape composition and video arts practice displaying their work in natural settings. The purpose of this study seeks to understand the values of reorienting environmental arts practice by placing New Media works directly in the natural landscape. We are reminded of Arnold Berleant's idea of the "aesthetic field," and the importance of how his concept of the "aesthetic engagement of nature" may bare upon the future of electronic environmental art praxis. Situated at the intersection of human societal concerns for the environment and interests in the human-machine relationship, our research responds to both, and to the particular demands of the dialog between them.

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THE VALUE OF SOCIAL RELATIONS

Elanor Colleoni

This paper outlines how social and affective relations shared via online social media sites are integrated into the process of value creation and transformed into tangible monetary value in the financial circuit in Informational Capitalism.

The development of an information economy, and in particular its more recent “social economy” phase, has seen the “pluralisation” of conceptions of value (Stark, 2009). The rise of brands, the growing importance of reputation, both for individuals and for companies, the need to attract affective investments and in general to establish a positive large-scale recognition for companies are all manifestation of this. While companies have clearly identified the strategic importance of these intangible assets, an adequate and broadly accepted interpretation of how such immaterial wealth is transformed into tangible monetary value still lack.

The process of value creation in Informational Capitalism

Traditionally, the process of value creation was conceived as a firm-centric issue. Particularly, Marxist labour theory of value identifies two essential processes in value creation: production and circulation. The production process takes place within the firm and is hierarchically organized by the employer who owns the means of production. The value is created by the “living labour” - i.e. the workers – and the specific value of a good is determined by the amount of labour time needed for its production (Marx, 1976). The labour force is exploited mainly because the price they have sold themselves in the labour market is less than the value gained from selling the goods produced and this difference represents the surplus value appropriated by the employers. The value extracted from the workers is “realized” in the circulation process: when commodities are effectively sold in the market place.

The advent of an informational economy has changed both the production and the circulation processes. The end of mass production capitalism and the transformation of productive systems that this has entailed have made measurable forms of labor time less essential as a source of value while the relevance of innovation, flexibility, brand and other intangible resources has risen in proportion.

The important thing about such intangible resources is that their production often occurs outside the control of single organizations, and sometimes, as in the case of brands, it builds on input from non-salaried actors including consumers and the public at large (Arvidsson, 2006). The creation of intangible value in the form of either a corporate culture conducive to innovation and teamwork, or an attractive brand, involves the appropriation of common knowledge, symbols, relations and competences, or General Intellect (Virno, 2004).

In its broader sense, General Intellect represents an emerging property of complex and heavily socialized forms of productive cooperation. As a consequence the value is based increasingly on the general productive power of the “social”. The achievement of cooperation and engagement, i.e. the mobilization of such networks, relies on the ability to establish affective recognition, such as reputation and goodwill, as well as to mobilize these affective bonds, like the ties that bind consumers into a community of interest or “tribe”. The ability to “activate” affective investments is considered a signal of

company wealth in financial markets, which increasingly represent the arena where the realization of value takes place in the circulation process (Marazzi, 2008).

However, the “intangible” nature of such affective bonds and consequently the complexity of their measurement represented a problematic issue until the diffusion of social media platforms.

Indeed, with the advent of Internet, and in particular the diffusion of social media platforms, such as Twitter and Facebook for customer co-production, or “prosumption” (Toffler,1980; Tapscott,1995), the influence of these new socialized networks and their productive power have become more visible and “tangible”. These platforms represent a materialization of what Gerlitz & Helmond (2010) call a “like economy”. In the like economy the main determination of value is direct forms of user engagement which has been objectified through the proliferation of “social buttons”, like Facebook’s like button, twitter’s re-tweet button, or bookmarking buttons on Digg or Reddit. Such social buttons “allow for transforming intensive social and affective dynamics into comparable metrics and thus add a social and personal qualification to the hit economy” (Gerlitz & Hemond, 2010: pp.3). In other words, the introduction of social buttons allow for an objectification and valorization of the users’ ability to create webs of affective attachments around informational objects, such as a corporate or a brand.

As a consequence, in the last few years a new set of data mining techniques, such as opinion mining and sentiment analysis has been developed in order to analyze massive data produced in social media sites and blogs and to quantitatively measure affective ties and opinions.

Particularly, sentiment analysis is part of the affective computing paradigm and refers to the process of categorization of unstructured human-authored documents “based on their affective orientation, meaning the emotional attitude of the person expressing the opinion” (Mølgaard & Szewczyk, 2010: p.1). Among other things, what sentiment analysis and opinion mining produce is an objective and “tangible form” of the affective investments around an object resulting as an emerging property of grassroots collective wisdom. In other words, they are transforming “intangible values” into a tangible form.

Social media and General Sentiment

These new data mining algorithms have created a recognized measure of social affective investments around a brand or a company which now can serve as a base to establish a new “general equivalent” - i.e. general sentiment – (Arvidsson, forthcoming). In Marx’ analysis of value, the labour time represents the general equivalent in the production process: It does not matter if you produce textile or concrete in your company, with different means of production or under different legislations. Labour time is an abstract unit of measure aimed at creating a common space for market exchanges. In the same way, general sentiment functions as a general equivalent in the ethical economy (Arvidsson, 2006). Individual expressions of affective attachment are converted into signal of wealth and trust as objectified flows of ‘potential’ value which is then realized into the financial markets.

According to this analysis, the role of social media and of web data mining is far beyond of being conceived as a new tool for targeted advertising. Indeed, social media platforms play an important role in defining the parameters of the distribution of such financial value by enabling the affect of the

multitude to be objectified into a brand, or conventions that can justify financial valuations. Consequently, online social media sites represent a unique place where the affective flows deriving from attention and “prosumer” inputs on the part of the multitude are organized and controlled.

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FROM HUT TO MONITOR: THE ELECTRIFICATION OF CHOKWE WALL MURALS IN ANGOLA, 1953-2006

Delinda Collier

My concern in this paper is with the continuous reinscription of protocols of access to ghosts and ancestors of a mythic past. The digitization of “African” culture presently thematized by many African artists negotiates communalism in terms of “free” information technology and visibility/access, a postcolonial return to ancestors that overcomes colonial appropriations of “African” creativity.



Fig. 1. Page from José Redinha, *Paredes Pintadas da Lunda*. Lisboa: Companhia de Diamantes de Angola, 1953, n.p.



Fig. 2. Page from Gerhard Kubik, *Tusona—Luchazi Ideographs: A graphic tradition practiced by a people of West-Central Africa*. Wien: Föhrenau, 1987, 49.

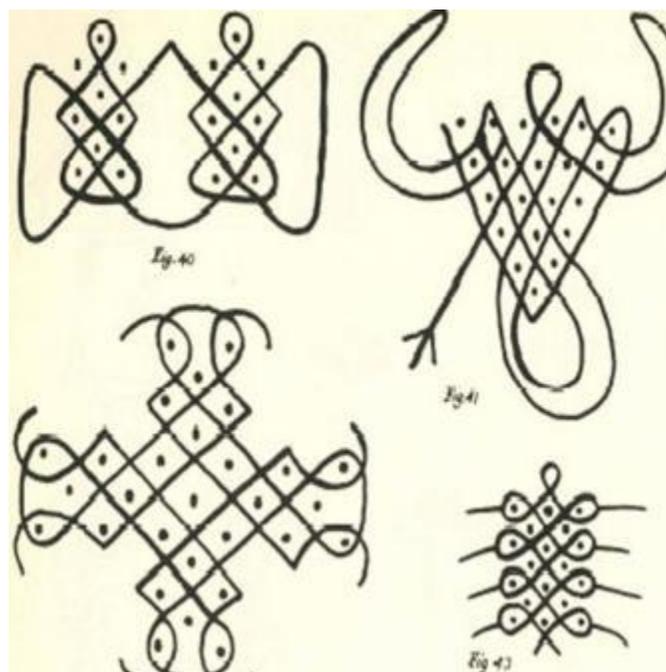


Fig. 3. Page from José Redinha, *Paredes Pintadas da Lunda* (Lisboa: Companhia de Diamantes de Angola, 1953), n.p.

In 1957, the Companhia de Diamantes de Angola [Diamang] completed a hydroelectric dam on the Luachimo River in northeastern Angola, in the Lunda North province. The dam was emblematic of Diamang's monumental presence and technical capacity that it meticulously developed throughout the twentieth century. Diamang was a mammoth diamond extraction company in Angola during the zenith of Portuguese colonial rule. By the 1950s, Diamang provided a large portion of funding to the colonial state seated in the capital of Luanda. It returned large profits to its Portuguese, Brazilian, American, and Russian investors. It was a "state within a state" with its own police force, radio station, museum, health services, and agriculture. Eighty percent of Diamang's workforce in the Lunda region was made up of the ethnic Chokwe group, a once powerful state that was defeated as the Portuguese made their final push into the interior of its massive colony. In this paper, the Luachimo Dam should come to symbolize the activity of mining an area for material and non-material resources, the transforming of matter into information and energy, and as being the catalyst of a disruption and enlargement of a feedback loop. It should represent the dual nature of the media used to inscribe and transmit Chokwe art: electrification and rationalism.

In 1953, Portuguese anthropologist José Redinha published a book on the topic of Chokwe wall murals, *Paredes Pintadas da Lunda* (Painted Walls of Lunda). Redinha was director of the Dundo Museum on Diamang's company compound and had for some time been interested in the murals; he was an artist and was fascinated by the murals' popular execution. He traveled around the immediate region and copied what he saw on the hut walls exactly, choosing paint in order to preserve the colors and even using the same pigments and binders as the Chokwe artists. Bertrand Brothers publishing house in Lisbon then printed the book using offset print and color plates. Since the company had no legal rights to sell the book, it was sent to academic libraries and museum collections worldwide.

In 2006, two online heritage projects were launched, both of which presented material digitized from Paredes. The Trienal de Luanda's website scanned the book's image plates as part of the online component of the first major contemporary art exhibition in Angola after the end of a devastating thirty year civil war. ITM Mining Ltd., a diamond company operating in Lunda North, launched www.culturalunda-tchokwe.com, which used both the scanned images from Paredes and transcribed its text. Angolan artist and Trienal de Luanda director Fernando Alvim authored both projects. Each was presented as a type of heritage project dedicated to disseminating the indigenous cultural production of Angola to a wider public. The Trienal emphasized the artistic merit of the images as such, photoshopping out the characteristic signature that Redinha placed on all of his images, in order to return them to Chokwe authorship. No context was provided for the images other than the project's conceptual essay that proposed to correct the wrongs of Redinha's appropriation of Chokwe art, as he did not include the names of individual artists. ITM presented the anthropological content of Paredes. As the company operates in the Lundas, they declare on their website, "Tradition as we respect cultural values." ITM is of the progeny of Diamang that resulted from Angola's nationalization of the diamond industry following its independence in 1974. Both the Trienal de Luanda and ITM's website had an ethos of participation. The Trienal encouraged public interpretation of Chokwe aesthetics through its gallery, internet, and billboard exhibitions, while ITM's message board and online forum solicited feedback and exchange.

In 1987, Friedrich Kittler wrote his influential essay "Gramophone, Film, Typewriter" on the eve of the internet revolution. Among other things, Kittler describes erasure of distinctions between media types with the transition to fiberoptic cable transmission and the gradual electrification of media. On the issue of how meaning is generated within this relatively new standard of information, he writes, "quotidian data flow must be arrested before it can become an image or sign. What is called style in art is only the switchboard of these scannings and selections." [1] He then describes a type of information hierarchy as a natural outcome of re-mediation, where one medium ghosts another through its obsolescence and related changes to our senses. Kittler's analysis dissects a process that is often regarded as a natural progression: the alphabetic monopoly of print media to the eventual triumph of electricity-based digital information.

I want to bring in a different aspect to Kittler's theory of media, one that accounts for both the historical contingencies of mediation and also to the blind spots in descriptions of its infiltration. In colonial situations, the abstraction of information that develops with mediation is inextricably bound up with extraction of materials such as diamonds, achieved as it was most often through coerced labor and societal violence. Consider, for instance, that one Diamang official could call the project to record folk songs "Song Service" in order to match it with the labels Mines Service, Construction Service, and Health Service. [2] Each of these was a piece of a total project of control over bodies and life in the Lundas. It would be inaccurate, therefore, to claim that the implementation of media conditions were universally experienced or, for that matter, inevitable.

The Dundo Museum was part of Diamang's project termed "Scientific Colonialism". The museum compound was a laboratory of Life found in the Lundas and must be seen as synonymous with Diamang's labor practices. The effort that materialized the diamonds, the book, the museum, the folk music records, and indeed the hydroelectric dam, all capitalized what Diamang extracted from Lunda North. Here, not only were the Chokwe, in the crassest of interpretations, considered matter, or the "real," but the idea of the real was itself developed within the logic of the media they used. The conditions that Diamang established were coterminous with the electrification of production and the ephemeralization of information.

In the case of colonialism in Africa, the ghosting of indigenous media practices was not an unfortunate consequence of colonial rule, as most scholars of the time understood it, but rather an intentional divestment of indigenous populations of power by participation. The now common knowledge that Europe created the notion of Africa as practicing unchanging traditions amounted to the limited definition of medium in Africa to that of objects and performances as emblems of superstitious practices. Under that logic, they had to remain static. One must look no further than the statement by Julio de Vilhena, who claimed that the Chokwe had a tendency to adopt music “other than the traditional, and withhold from the traditional the value and importance attributed to it by his ancestors.” [3] He goes on to argue that Diamang must “[show] him the value of his folklore, by inducing him to cultivate it regularly” by providing them with positive encouragement. [4] Vilhena even suggests that the whites clap for the natives after performances, a type of feedback that indicates paternalism, where Chokwe art and performance is not an open system, but rather artifactual data in a control system. There were, then, implications of the process of etching voice into “fragile stock[s] of virgin discs...in the tropics” beyond just ghosting certain sense perceptions through transformations in media. [5]

One such mnemonic and oral practice based on participation and permutation with the Chokwe is called “sona,” a type of drawing that appeared in the murals that Redinha copied. Authors variously define lusona (plural of sona) as mnemonic devices, symbols, pictograms, ideograms, and mathematical formulae. Chokwe terminology for the practice has not allowed for an open interpretation for outside scholars, either as a matter of fact or because of purposeful concealment of specialized knowledge. That is, sona is a code. In its formalized practice, only the male elders had the specialized knowledge of the algorithms and knew their relationship to the various tales, figures, and behavioral instruction. Therefore, within Chokwe society, lusona represent the hierarchal structure of access to knowledge, resources, and contact with the ancestors.

The word sona can indicate the name of the practice or the finished visual symbol. The process by which lusona are drawn in the sand is formulaic, as is the format of the resulting images, though they can be embellished. The akwa kuta sona, the elder maker of the drawing who is usually in his fifties or sixties, finds a patch of ground and smoothes it to make a clear drawing surface. He begins the drawing by impressing dots with the tips of his fingers. These dots form a grid structure in which the dots are carefully plotted equidistant from one another, measured by the distance between the fingers. (see fig. 1)

After the akwa kuta sona has plotted the grid specific to the sona, he begins to draw an unbroken line around the dots. He circumnavigates each of the dots quickly and precisely, creating an even and symmetrical lattice pattern. [6] They can be enlarged or diminished according to the operating algorithm. Given their performative nature, there is great pressure on the akwa kuta sonas to execute the drawings perfectly. Mistakes are often marked by laughter or a quiet sarcasm. [7] For that reason, sona is a popular pastime for Chokwe and a favorite activity as men pass through each other’s villages. It is a social event, a conventional way to disseminate information and to reinforce the social code. Crucial for the current discussion, however, is that sona allows for innovation based on new iterations of standard algorithms.

Increasingly, scholars of lusona have explicated the range of algorithmic operations involved, concluding that it is at once a specialized mental activity, a body of shared knowledge, and a recursive operation. They are not only, as Redinha constructs them in his book, a repository of forms. The morphing of resulting figures and images is facilitated by the simplicity of sona’s building blocks, the line and dot. The drawing’s value lies in the mastery of an operation that lays bare a clear binary code by which the resulting image, whether representational or not, is an outcome of an operation and is not *a priori* visual.

Thus, sona involves both mnemonics for the memorization of form and also the development of operational logic. Because of this, sona performs a social function in excluding certain members of the community from restricted physical and intellectual spaces, while it can also be a purely ludic activity. It was this ludic aspect of the images that Redinha was interested in, as he was driven to discover the “soul” of the Chokwe people.

Redinha’s *Paredes Pintadas da Lunda* compiled the finished visual figures of sona that were painted by non-practitioners on the huts. (fig. 2) Redinha found vernacular interpretations of lusona, the optical “interface” of lusona. Because of his interest in non-professional art and his preconceived social biases, he ignored the operational aspects of sona drawing. Redinha’s book, its format and its logic, re-semantized the symbols to act as identifiable cultural characteristics. The Social Darwinist model through which Redinha reads sona drawing, from rock art to ethno-cultural symbol, speaks to the ultimate irrelevance of Chokwe logic within Portuguese colonial occupation.

Sona is also the Chokwe word for writing and likewise a code that enacts a bi-directional mediation with the real, of which the ancestors are a part. Sona mediates access to their power, the acknowledgement of their continued presence in the world, and the methods to influence their decisions. Sona incorporates feedback into its political and cultural message, but also refers to itself as a system. Additionally, sona is a medium with its own history of imperializing previous media. Representational and mediatic colonization, in fact, was integral to the Chokwe 19th century expansion.

Diamang’s by then anachronistic project of Scientific Colonialism not only codified life itself in Chokwe territory, but its policies also forced a separation between their intellectual and physical labor. As water passed through the Luachimo Dam, the Chokwe body passed through Diamang’s health services, educational reform, sports, and displays of culture. Both the dam and book conceptualize Africa as a resource holding energy that can be used, circulated, and stored, much like the raw diamond is transformed into a financial commodity. The electrification of lusona rerouted their feedback loop across oceans and into global finance, discourses of Africa, primitivism, anthropology, and art history.

Kittler writes of the societal correlations of media logic: “Mouths and graphisms dropped into prehistory. Otherwise, events and their stories could not have been connected. The commands and judgments, the announcements and prescriptions that gave rise to mountains of corpses—military and juridical, religious and medical—all went through the same channel that held the monopoly on the descriptions of those mountains of corpses.” [8] Kittler’s “channel” emphasizes the specificity of the mode of transmission and the type of information suited to the communication circuit. Algorithms animated by the dam and the division of labor in Diamang’s production line were of the same order that Redinha’s book was published under: typeset, offset printing, serial pages, etc.

The Luachimo hydroelectric dam in the 1950s in many ways already prefigured the death of mechanization and of Redinha’s book. As an effect of electricity, hardware, and code, Chokwe art is information within the Trienal de Luanda Lunda Tchokwe and ITM Cultura Tchokwe re-mediation projects. The death of Redinha’s book performed by the websites is analogous to the transition from archive to database. Chokwe art so configured is morphological and, accordingly, can be directed to very different ends. One site thematizes a correction of the wrongs of Angola’s colonial past through aesthetic participation. The other declares a diamond company’s dedication to its neighbors and workers, which only thinly veils the continued violence of the industry. Given my previous argument that colonialism is embedded in the very DNA of media, what are the protocols of power and access to the ancestors (read history) today?

Both sites share the same author, code, basic format, and mode of transmission. Both depend on a functional electric grid, hardware, and access to Redinha's book and the web, all of which are tenuous in Angola. The images and text on both sites are syntactically propelled forward as they were in *Paredes*. The hypertextual progression through the images and information has no direct indexical relationship to the sand or hut, and serves to veil the relationship to its infrastructure. The images and information on both websites are purely optical manifestations of labyrinthine protocological operations. As Redinha's book displayed the optical effects of sona, effectively veiling the protocols of sona production, so does the monitor embody ludic capitalism, spectrifying the bodies and matter on the other side of the electrified interface.

References and Notes:

1. Friedrich Kittler, "Gramophone, Film, Typewriter," *October* (Summer 1987): 104.
2. Julio de Vilhena, "A Note on the Dundo Museum of the Companhia de Diamantes de Angola," *Journal of the International Folk Music Council* (1955): 42.
3. *Ibid.*, 41.
4. *Ibid.*, 41.
5. *Ibid.*, 43. In a topic for further discussion, it should be pointed out that Africa has continued to feel the effects of the globalization of information and media in the extraction and disposal of raw materials for hardware. Among other examples, see the impact of coltan mining in the Congo and computer waste disposal in Nigeria.
6. The type and existence of symmetry in lusona can vary according to the type of drawing. See Paulus Gerdes, *Sona Geometry: Reflections on the Tradition of Sand Drawings in Africa South of the Equator* (Maputo, Moçambique: Instituto Superior Pedagógico Moçambique, 1994).
7. Paulus Gerdes, *Sona Geometry: Reflections on the Tradition of Sand Drawings in Africa South of the Equator* (Maputo: Instituto Superior Pedagógico Moçambique, 1994): 14.
8. Friedrich Kittler (1987), 105.

HERE AND THERE

Susan Collins

Susan Collins places network cameras in remote locations constructing landscape and seascape images continuously, pixel by pixel over time. The work provides an in-depth study of place, introducing a representation of time showing simultaneously day and night views of the same scene studied and recorded over the course of the year. This presentation explores the introduction of new devices and language to the tradition of representation.



Glenlandia, 19 August 2005 09:53am, 2005, Susan Collins, Digital Still from Archive (detail), Copyright Susan Collins.

INTRODUCTION

I am a fine artist who works across a range of media including sound, internet, video and installation. Most of my work has been made in response to different sites and situations with my recent works mainly employing transmission, networking and time as primary materials, often exploring the role of illusion or belief in their construction and interpretation. It is a series of works exploring what it might mean to record a digital image and transmit it across space and time that I am going to present and discuss today, work which relies on transmission and the network for its fabrication.

I have been working for a number of years on recording landscapes using pictures transmitted live from remote network cameras. These images are made pixel by pixel, from top to bottom and left to right in horizontal bands continuously so that a whole image is made up of individual pixels collected over a period of time. When the image is completed, it starts again at the top left of the image and writes over itself. The images are low resolution – 320 x 240 – so that at the rate of a pixel a second, a whole image is made up of individual pixels collected over 76,800 seconds or 21.33 hours, just under a day.

FENLANDIA/GLENLANDIA

I have placed cameras in a number of locations resulting in works including *Fenlandia* – developed with Film and Video Umbrella – where a network camera was placed on the roof of a 17th c. coaching inn in

rural Cambridgeshire for a year; and *Glenlandia*, developed with Horsecross in Perth, where a camera was installed in a fisheries research laboratory looking out over Loch Faskally, Perthshire, Scotland for two years. Both these works deliberately trade on the convention – or rather the perceived convention – of how a landscape image might historically have been composed and constructed, however, while both compositions appeared to be of natural landscapes, technology was in fact embedded seamlessly into both images. With *Fenlandia* the camera was looking out over a technological marvel of an earlier age, the fens of Cambridgeshire – a reclaimed land of sluices, ditches and drains; whilst the subject of *Glenlandia*, Loch Faskally, is in fact, a manmade loch which services a hydro-electric dam in Pitlochry, providing power to the surrounding glens.

When archived and lined up together in series the images present a heightened sense of time, revealing all sorts of shifts and changes – from the thinning and widening band of black (nighttime) showing the lengthening and shortening days throughout the year – to the full moon that *Glenlandia* occasionally captured and which appears as if a white comet streaking through the night sky but is in fact, the moon slipping through the image over time.

I view this work as a kind of ‘open system’. One inhabited and activated by light, day, night, weather, movement of the sun, the moon, the seasons and all these analogue variables that conspire to produce an infinite variety of unique images.

SEASCAPE

I became interested in developing further the potential for abstraction in the work, and I began looking at the seascape as a potential subject while artist in residence at Monash University in Melbourne in 2006; experimenting by constructing images from Australian ‘surfcams’ – the webcams set up on surfer beaches to let the surfers know when the surfing is good.

The *Seascape* project emerged from this when I was invited to develop the work further with Film and Video Umbrella and the De La Warr Pavilion, Bexhill-on-Sea, a modernist icon on the south east coast of England housing a gallery whose long wall of picture windows look directly out to sea. Between March and October 2008, networked cameras were installed at five different vantage points along the south coast of England: at Margate, Folkestone, Bexhill-on-Sea, Pagham (near Bognor Regis) and Stokes Bay (near Gosport). The intention was to create a panoramic work that would directly reference the Bexhill seascape view while extending it to encompass and appropriate other vantage points across the south coast. Each camera transmitted an image to its own server in London, which then constructed and archived the images. For *Seascape*, I changed the timing of the construction of the images so that a whole image was made from individual pixels collected over just under seven hours, which is approximately the time it takes for the tide to come in or go out.

At the De La Warr Pavilion, five live projections showing the seascapes being constructed in real time were projected into the windows, against the backdrop of the actual, live coast itself. I set the view for each camera to frame the sea and sky with a common horizon line so that each image might be seen to form a fragment of the continuous panorama that is the South East coast.

In some images, you can see the picture evolve from night-time through dawn with the sun appearing on the water later in the day. Sea and sky often became interchangeable, creating false horizons through the horizontal construction of the image combined with fast changing light and weather conditions.

I also selected a series of stills from the archive to show as prints, regarding each of these as a complete work in itself that might be seen as a form of timelapse caught within a single frame – positioned somewhere between the still and the moving image, the lens and the pixel.

CONCLUSION

Whilst this process reveals some things such as the movement of the moon through the sky in *Glenlandia*, it misses others. For instance, in *Seascape*, the most violent lightning storm might appear as just a few stray pixels giving little or no sense of a turbulent sea. A re-presentation of a familiar subject, it is reality but not as one normally witnesses it. Six or seven hours compresses into a single frame, time shifts, and while the source for the image may have come from a landscape or seascape, the image has the potential to become autonomous, something else, with the accrual of the image over time bringing its own set of artefacts and abstractions.

INDEXICAL IMMATERIALITY: PHOTOGRAPHY AND FILM INSIDE THE MACHINE

Rosemary Comella

At stake in my research in interface design is the indexicality of the photographic, not just its function in fixing moments of historical time but also the ambiguity of its meaning and the ability to navigate between its material and immaterial aspects. In contrast to the idea that the digital is eroding the power of the photographic, the digital extends its role as a conceptual art and is a rich area for exploration in interface design.



Fig 1. Cultivating Pasadena: From Roses to Redevelopment, 2005 © The Labyrinth Project, USC



Fig 2. Tracing the Decay of Fiction: Encounter with a Film by Pat O'Neill, 2002 © The Labyrinth Project, USC

Certainly, within film theory, confronted with the threat and/or promise of the digital, indexicality as a category has attained a new centrality....

—Mary Ann Doane “The Indexical and the Concept of Medium Specificity” (2006)

In the work that I do I am drawn to the indexicality of the photographic, that is its trace of the real, and wonder how this may function differently within a computerized environment than in a cinematic one. How does the photographic, whether still or moving, affects one’s sense of space and time once subsumed within a computer interface. If, in cinema, movement, and sequence represent time, then does a still photograph represent space? How does the indexicality of the photographic function within a computer interface? How is it different than within cinema, or is cinema just another type of interface that doesn’t significantly affect this? If we look at cinema for an answer, then, what can we conclude about Chris Marker’s film *La jeteé* (1962), a series of stills about a man who time-travels? Or Michael Snow’s 45-minute film, *Wavelength* (1967), a single shot as the camera’s lens slowly zooms across the space of a New York loft, to a still photograph on the wall opposite. Or the embodied time rendered in Michelangelo Antonioni’s films where viewers feel the sheer duration of the on-screen events? Even within one medium there exist a wide variety of techniques that can affect one’s sense of space and time quite differently.

It is in this vein that I examine *Tracing the Decay of Fiction: Encounters with a Film by Pat O’Neill* (2002) and *Cultivating Pasadena: From Roses to Redevelopment* (2005), two interfaces that I was key in developing while working at USC’s The Labyrinth Project. Both these works present full-screen photographic imagery within a robust computer interface, yet they move physically and emotionally in different ways. One privileges archival and contemporary still photography, and explores a city’s history through this imagery, while the other privileges the cinematic by converting contemporary 35mm film footage of a dilapidated hotel into an interface that combines history and fiction. The content and style of both of these works has no doubt benefited greatly from the influence of certain modernist cinematic inclinations, like those already mentioned, as well as in films by Alain Resnais with their emphasis on the past haunting the present, and the mix of fiction and history, or by Federico Fellini’s tangents and digressions. Furthermore, the 35mm film we worked with is by renowned experimental filmmaker, Pat O’Neill, who has created various strategies and techniques—around issues of movement, time and space—that, in their inventiveness and execution, inspired the design of a unique interface.

Before I began working in new media, I was experimenting in photography as conceptual art and did not necessarily see it functioning as a pure medium, but as something that could easily encompass hybrid artistic forms and technologies. This eventually led me into new media as an art form and makes sense now, for these times, described by art theorist Rosalind Krauss as our “post-medium condition.” Krauss suggests that art’s adoption of photography—as not so much a specific medium but as a “theoretical object”—was a precursor to this condition. In 1980, Barthes published *Camera Lucida* in which he also considers the photograph as a theoretical object. Barthes writes about how he considered the photograph not only to be unique in its representation of reality as an actual “trace of the real” but also to be something akin to “the child pointing his finger at something and saying: that, there it is, lo! but nothing else.” It is interesting to consider the use of technology as a way of pointing at things. In this sense, a mouse, cursor and camera have something in common. In 1978, I had made my first encounter with a computer as a worker producing letters on a word processor with no images and no mouse. Now, I find it interesting to consider how my livelihood as an administrator and my avocation as an artist working in photography merged so quickly. I went from developing and printing film in the darkroom and experi-

menting with biochemical processes to scanning in analog photographs for manipulation on the computer, to directly hooking up a digital camera to the computer, voilà, no film. One could be expected to wonder: in this evolution of photography onto the computer what exactly is happening?

Now that these areas have joined forces, each has been transformed. Indeed, in the infinite possibilities of its manipulation by the machine, now re-constructed via bits and pixels, and removed from its biochemical process, the photographic has further lost its credibility as a representation of some kind of truth. Also, the computer has progressed from its first tasks of evaluating polynomials to word processing, telecommunication and so forth, to now being also a machine for the creation and manipulation of image and sound as well as their viewing in a conflation of a cinema-computer (Manovich, 2001). We still trust the computer's ability to do invisible computational tasks, and similarly the photograph has not completely lost its credibility to visualize the real. What Susan Sontag wrote in *On Photography* in 1973, still has resonance: "The picture may distort; but there is always a presumption that something exists, or did exist, which is like what's in the picture." The photochemical image as trace and thereby as index of the real does not preclude the digital photograph from bearing this trace as well. There is still the pointing finger.

What I am curious about is how photography or cinematography exists, or functions, within an environment that tends to spatialize data. How can existing techniques for exploring space and time as found in experimental film, video and photography be employed within a computer interface? Can these techniques and the computer's inexhaustible ability to spatialize, manipulate and present data be combined in ways not yet explored? The interactive nature of the computer makes viewing content a different experience from that of cinema or television. Yet, a clip viewed on the computer is not so different from viewing it on television. That is, until it is made programmable. I find myself, so-to-speak, drawn to this place—where all media, once digitized, is created equal (Manovich, 2001). It is at this point where interface design takes place and artists, interface designers and programmers can really explore giving users a different kind of experience.

For my purposes, it is interesting to consider visual effects found in cinema— such as animations, dissolves, abstractions, montage, framing and composite images. They are both material and symbolic. A dissolve is just an image atomizing into very fine particles, but metaphorically it can represent a transition, or relay an emotional state. The experiments of avant-garde filmmakers and photographers have already made their way into the popular imagination as ways of representing mental processes. How can this materiality be transformed within the programmable computer and made to serve the agency of the viewer in a way that will be different than if it was viewed in a film or video? It is here that I would situate the crux of the work that I have done and that I would like to expand upon for future projects.

Both the projects addressed in this essay are concerned with giving the user a full-screen, photographic or, cinematic experience, but one with the pleasure of agency—not only a space or place to embody but a unique way to navigate it too. Giving a sense of embodied space within a new media environment demands that an interface designer create suggestive "real world" models or metaphors of navigation that reverberate cognitively and emotionally for the user. The following considers the two above-mentioned projects in this register.

The goal of *Cultivating Pasadena* is to allow the user to visually explore the development of Pasadena and its surrounds from the end of the 19th Century to the present in a unique and enjoyable way. The project's main appeal is the archival and contemporary camera shots of the exact same place taken decades or even more than a century apart. Users can perform cross-dissolves between archival black-

and-white photographs and contemporary color photographs of precisely the same city scene—often taken many decades apart—and easily and precisely control the speed and repeatability of the cross-dissolve between the two images—pausing, reversing, as well as comparing smaller versions of the images side by side. It is the simple action of moving the cursor from the left to the right of the viewing screen to see the photograph change from “then” to “now”. If the user stops or slows down somewhere in the middle, she can examine at leisure how the images intermingle and overlap, noting the ghostly impressions one photograph leaves behind as it is totally replaced by the other. (The archival photograph is black-and-white and the contemporary photograph is in color so it is easier to distinguish what superimpositions belong to what photograph.) It is both a material occurrence and psychological activity, suggesting among other things, time-travel and recoverable memory. In a much more prosaic way than *La jetée*, it also has the effect, like the film’s narrator says, of drawing attention to “the paradoxes of time” and perhaps, reminding one that, “there is no way out of time.”

For me, the cross-dissolves in *Cultivating* provide the “punctum” that Barthes discusses in *Camera Lucida*, but in a slightly different way—a kind of double punctum. In describing this concept Barthes implies that it is something the viewer adds to the image. The experience is something analogous to Barthes’ description of Lacan’s concept of the *Tuché*, the chance encounter with trauma. In Lacanian terms the *Tuché* or touch is the disruption of the compulsory self-regulation of the symbolic order—the moment when something happens to break its normal operations and reveal the Real—which ‘pierces the viewer’. In *Cultivating*, the work itself adds a kind of punctum in revealing the contemporary image and, perhaps, a radical transformation, but the viewer must herself add something in the gap or absence of time between the images. In a sense, *Cultivating* is a work that tries to straddle the symbolic and the Real. Symbolically it is a space in which to explore change, transformation and preservation on topics ranging from architecture, cityscapes and geography to culture, race and community. Also, the photographs, labeled and described, are objects of discussion for historians and aficionados of Pasadena, thereby entering into the realm of language and the symbolic. The Real in *Cultivating* is the demonstration of the passage of time and the transitory nature of life.

In transitioning from a discussion of *Cultivating*—which though it contains some video and sound, is essentially grounded in still photography—to a work that is based on a 35mm film, one may consider what Barthes says about film. He asks: “Do I add to the images in movies? I don’t think so; I don’t have time: in front of the screen, I am not free to shut my eyes; otherwise, opening them again, I would not discover the same image; I am constrained to a continuous voracity; a host of other qualities, but not pensiveness....” It is essentially film’s ability to capture time and movement that separates it from photography, which freezes the moment. It is these two features that are played with in the interface to the interactive film described below.

Like Pasadena, the Hotel Ambassador in Los Angeles—the place O’Neill filmed—has a culturally important history, yet due to the cinematic ‘noir look’ of his footage one could be forgiven for entering into its space, perhaps expecting a story. However, *Tracing the Decay of Fiction* frustrates the viewer in terms of a traditional narrative story and has more in common with a film like *L’année dernière à Marienbad* in its enigmatic narrative structure. It is also quite different than the somewhat straightforward cultural history presented in *Cultivating* in that history and fiction blur. The similarities between the two works are that they both are an indexical record of an actual space over time and both provide the user with a way of navigating that recorded space. *Cultivating* privileges the still image and it is through these still images that one navigates which is quite the opposite in *Tracing* where the film is the ground on which one ‘exists’ rather than a changing set of different photographs by different photographers over many

decades. *Tracing* is more stylistically and spatially cohesive. It was filmed in one location, by one filmmaker and in a relatively short period of time. The space was filmed empty and with an eye for its nostalgic affect on visitors. O'Neill employed certain techniques such as time-lapse photography on a computer-controlled dolly system to accentuate this feeling of time passing. One could identify with this particular omnipotent stylistic camerawork as if it were one's own eyes—delighted by the play of light within in the hotel and on its grounds—that had captured it. In other words, there is something already intrinsically subjective about witnessing this camera vision, without then being given some direct control over it by an intuitive and nearly invisible interface. Within a computer interface, the ability of the user to control the vision of the camera can itself be the subject. In *Tracing*, the combination of time-lapse photography captured by a camera smoothly and steadily moving through a hotel, uncovering it in turns, with rapidly changing light and shadow became the reason for the interface. Watching this footage, one feels transported into an uncanny world where space and time are somehow different. The key to designing the interface was mainly to not impair this aesthetic experience.

Ordinarily, a space one can navigate on the computer is 3-D modeled, or virtual, like those found in a computer game or an architectural fly-through. Like the camera itself, a new media object can replicate human vision and agency. In the words of Lev Manovich: "As computer culture gradually spatializes all representations and experiences, they [users] are subject to the camera's particular grammar of data access. Zoom, tilt, pan, and track—we now use these operations to interact with data spaces, models, objects, and bodies." What is different about this work, however, is that you are navigating actual recorded two-dimensional space enhanced by time-lapse photography and a computer-controlled camera and tracking dolly system. The experience of navigating through this richly descriptive footage, this aestheticized trace of the real, and the fact that one must actually activate the movement or stand still, combines to feel like an uncanny experience of time and space. What would Barthes make of this? In *Camera Lucida* he writes: "Like the real world, the filmic world is sustained by the presumption that, as Husserl says, 'the experience will constantly continue to flow by in the same constitutive style'; but the Photograph breaks the 'constitutive style' (this is its astonishment); it is without future (this is its pathos, its melancholy)." Might he consider this work both photographic, in the melancholic way that he describes, and cinematic, simultaneously?

Mary Ann Doane writes: "Hence—and I think Krauss would agree—it is ultimately impossible either to reduce the concept of medium to materiality or to disengage it from that notion. In its very resistance, matter generates the forms and modes of aesthetic apprehension. Yet, technologies of mechanical and electronic reproduction, from photography through digital media, appear to move asymptotically toward immateriality...." For me, this raises the question that within the digital what is the difference between the material and immaterial? Doesn't the digital help to extend the role of photography as a form of conceptual art and be a rich area for exploration in interface design?

References and Notes:

The Labyrinth Project is a research project on interactive narrative under the direction of Marsha Kinder with collaborators Rosemary Comella, Kristy H.A. Kang, Andreas Kratky and Scott Mahoy. The goal of this theory and practice research, in Kinder's words, "is to generate a productive dialogue between the language of cinema and the interactive potential of new media."

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ART OF DECISION: AN INTERDISCIPLINARY APPROACH TO RAISING AWARENESS OF ACTIVE CITIZENSHIP

Fionnuala Conway & Linda Doyle

Art of Decision explores the possibilities that creative applications of multimedia and technology, in combination with an artistic approach, offer for the development of innovative ways to raise awareness of Active Citizenship. The exhibition consists of 9 interactive multimedia rooms that present opinions from research participants in an engaging way alongside statistical information, using sound, film, and interactive installations.

Since the 1990s, there has been a renewed interest in the concept of citizenship as an important idea that has relevance to today's social and political problems. [1] In the Irish context, citizenship has become more relevant in the context of recent social, economic and demographic changes in Irish society. Ireland continues to experience significant levels of voter apathy, increasing immigration and increasing diversity around moral, religious and ethical perspectives. [2] These developments in Irish society have made it clear that the health and stability of Irish democracy depends not only on its basic structures (political structure, representation and accountability) but, on the qualities and attitudes of its citizens; for example, how citizens respond to these social, economic and demographic changes; how they participate in government in order to represent the public good and hold politicians accountable. [3] Since the early 1990s, there has been a growing concern, at both the international and Irish level, for a definition of citizenship that focuses on "the identity and conduct of individual citizens, including their responsibilities, loyalties and roles." (ibid) A review of the health of Irish democracy based on standard indicators such as voter participation and representation does not give it a 'clean bill of health'. These inequalities in representation stem from inequalities in political participation and are a cause of great concern for the health of Irish democracy. The matter is of such concern that the Democracy Commission was established in 2003 to address the issue of poor participation, unequal representation of groups and general civic and political disengagement in the country. [4]

2 The individual at the heart of Active Citizenship

Following on from the Democracy Commission report, increasing attention has been given to addressing citizen engagement. The importance of the community and voluntary sector has been seen as playing a considerable part in establishing a strong civic culture and society. In April 2006, the Prime Minister, Bertie Ahern established a Taskforce on Active Citizenship "to recommend measures which could be taken as part of public policy to facilitate a greater degree of engagement by citizens in all aspects of life and the growth and development of voluntary organisations as part of a strong civic culture." [5] The Taskforce on Active Citizenship conducted a *Survey of Civic Engagement* in order to begin to measure social capital and found that overall the levels were very healthy, with no apparent decline in recent years in levels of volunteering, active membership of community and voluntary organisations. [6] The Taskforce have also looked to the civic republican tradition as a means to actively encourage citizens to participate. The distinguishing feature of civic republicans, that separates them from other participations is the exhibition, therefore, explore "emphasis on the intrinsic value of political participation for

the participants themselves.” [3] The Taskforce definition of ‘active citizenship’ has now established a definition of the ‘active citizen’ as one who plays a role in the family, their neighbourhood, their community, voluntary organizations, the workplace, as well as in political structures.

In their final report to government, the Taskforce presented a set of recommendations to enhance the work already being done to develop a strong, independent, and inclusive civil society. [5] Among others, the recommendations relate to institutional and procedural mechanisms as well as citizen engagement measures aimed at increasing participation in the democratic process. [5] Of specific interest to this research is the Taskforce recommendation that innovative projects to raise awareness of Active Citizenship should be supported. The Taskforce suggests that projects in which community development and Active Citizenship are presented as something “attractive, real and personal could spark public debate and interest.” [5]

In this spirit of pursuing innovation, the remainder of this paper presents an overview of the *Art of Decision* mixed-method approach and interactive multimedia exhibition that explores new ways to raise awareness of Active Citizenship, in a manner that makes it attractive, personal, and engaging. [7] Multimedia and new artistic modes of information presentation, in combination with qualitative social research methods are used to provide a platform for the presentation of information on Active Citizenship and content drawn from personal views, insights and opinions of people and their communities. The *Art of Decision* research and resulting exhibition therefore explore the possibilities that creative applications of multimedia and technology, in combination with an artistic approach and aesthetic sensibilities, offer for the development of new innovative approaches and responses to the Taskforce recommendation.

3 Art of Decision: an interdisciplinary approach to design

In the last decade of the twentieth century, computer technologies have played a dynamic and increasingly important role in altering how we make art in all disciplines. [8] The characteristics of multimedia as defined by Packer and Jordan present defining emergent characteristics of the diverse array of multimedia presentations that set them apart from other media presentations including the integration of all art forms; interactivity that offers the user new ways to manipulate media and communicate with others; the use of hypertext and hypermedia; immersion in different experiences through entry into the simulation or suggestion of a 3D environment; alternative narrative structures. [9] Artist-researchers continue to address the use of computers to advance the presentation and organisation of large volumes of complex information and are looking at new ways to visualise and allow interaction with information by creating visualisation methods that incorporate experimental two-dimensional, three-dimensional, time-based, meaningful and metaphoric visualisation, and interactive environments. This way of doing things is significant in that it not only exploits new technologies to facilitate the expression of artistic ideas but has also brought about new stylistic and aesthetic modes of thinking arising out of the conceptual implications of the use of technology in an art context. These characteristics and approaches define a way of doing things, both artistically and technologically, and an approach to artistic creation that was adopted for the research and design of the *Art of Decision* exhibition.

At the heart of this research is the use of art to raise awareness of an issue of social concern and the creation of artwork that can be used for that purpose. The application-oriented approach requires that the artist considers the context for the work, the variety of artistic and technological methods available to realize the work, and importantly that the artist has a concern for the human dimension in addressing

the creation of such a work. There is a need for multiple disciplines, methods and perspectives to illuminate the human context [10] and input is needed from a variety of disciplines relevant to the study, in this case including art, technology, design, politics, and social science. Social research offers useful methods for an enquiry into what people think about issues, which can give the artist a unique perspective and offer opportunities for reflexivity. Interview and media-elicitation methods are a particular part of this approach to enquiry and the generation of participant-authored content that is presented in this research. Social research also offers methods to organise and present the resulting data. In particular, content analysis and thematic networks analysis offer ways for the artist to structure and present the information in themes that can be presented using multimedia and technology in an artistic manner. *Art of Decision* draws from these methods but is primarily situated in the art and technology field.

It is worth mentioning here that this research and the resulting art exhibition are not an examination of how the artwork can bring about social change. This type of evaluation presents other challenges and perhaps is best examined from another research area. The work presented here is about the exploration of artistic practice, informed by political theory and social research methods, with the aim of creating art that raises awareness of social issues, with a particular focus on Active Citizenship. The next section will provide a brief overview of the *Art of Decision* exhibits.

4 *Art of Decision*: themes and exhibits

The *Art of Decision* exhibition is a series of 9 interactive multimedia exhibits that present opinions and ideas about power and decision-making from a variety of research participants in an engaging, theatrical way. Contributors' ideas are presented alongside statistical information in a meaningful and innovative fashion using sound, film, and interactive installations. The technology also facilitates visitors to contribute their ideas to the exhibition as it evolves in the space and in future research. For the purposes of this paper, these exhibits will be presented briefly under the three broad themes:

- a) information presentation: *DATAm*
- b) insights and opinions on Active Citizenship: *Decisions*³, *Finding Your Voice: Siobhán's story* and *Mamo's story*, *VIP room*, *Images of Power/Powerhouse*
- c) react, take part and debate: *Art of Decision Daily Post*, *Rantroom* and *Rite of Passage*

THEME 1: INFORMATION PRESENTATION

Art and technology offer new and alternative possibilities for presentation and audience engagement. The artist working with multimedia and technology can exploit these possibilities to present a complex view of many layers of information in an accessible and meaningful way. While this approach permeates throughout the entire exhibition, and all the rooms in the exhibition present information of some form or another, *DATAm* is solely dedicated to enriching the presentation of factual information, specifically the levels of representation in Irish State bodies, with a focus on gender balance.

DATAm is a large-scale interactive map of Ireland (housed in a room that is 48ft long, 24ft wide and 12ft high) designed to present statistical information on the gender makeup of Irish decision-making bodies in a novel way, presented on 6 surrounding projector screens. As visitors enter the installation, they are presented with lights illuminating sensors that correspond with information points. As they walk across the map, visitors trigger animations that present data on the gender balance on Irish State bodies in over 70 locations around the country.

THEME 2: INSIGHTS AND OPINIONS ON ACTIVE CITIZENSHIP

Media research methods, and the generation of text, audio, video and image authored by participants or created through interview, are appealing to the artist as they can be used in multimedia presentation. The exploration of content can be facilitated with the aid of social research techniques such as content analysis and thematic networks analysis that allow the researcher to sift through data and organise it. The artist is interested in using the themes that emerge from the enquiry as a way of presenting Active Citizenship and is particularly interested in participant-authored content as it can be used to present Active Citizenship in a more personal and meaningful way. The analytical process is very much an exploration to find out the general themes that describe what people think on the topic. Media research methods were used extensively in the research and design phase of *Art of Decision* and resulted in five of the nine exhibits presenting participant-authored and participant-generated media.

Decisions³ is a short documentary video where 9 contributors present their perspectives on decision-making. The filmed interviews were an attempt to get people to reflect on the similarities and disparities between their own decision-making and political decision-making such as happens at national government level. The documentary video is presented in a darkened room and is projected on a screen that is split into three panels so that three people speak simultaneously. Each division of the screen (panel) has a dedicated speaker that allows for sound to be directed to a particular spot in the screening room.

The ***Finding Your Voice – Mamo’s Story And Siobhán’s Story*** exhibits encourage visitors to find their political voice through the experience of listening to the personal stories of 2 women, Mamo and Siobhán. The two stories presented here are drawn from recorded interviews made by Melissa Thompson, an American documentary filmmaker, and are special and illuminating because they tell of external forces and circumstances that affected these women and how, as a result, they turned their lives around. Both women tell personal stories of their life experience, overcoming the odds and being drawn into political action. The concept relies on the motivating power of the interviews and their impact as role models. Both stories are recordings of the women’s own voices, presented in two small, intimate spaces as audio installations with lighting that changes and responds to the stories as they unfold.

The ***VIP room*** exhibit presents 8 contributors’ perspectives on the different types of players in the Irish political power game, the nature and direction of their influence and maps the interrelationships between them. Visitors navigate through this power map using a control that allows manipulation of a 3D model of the VIPs on screen. The *VIP room* sets out to make visible the political power game, its players and the way they interact. The project was administered as an interview wherein 8 participants from a wide demographic were asked to identify, in their opinion, the sites of political power in Ireland and plot and draw a map of these sites of power, their interrelationships and the degree of influence exerted by each site. As visitors enter the room, they are presented with an interface that shows a participant’s hand-drawn map on a small screen and control dials for manipulating a 3D model representation of the map, which is presented on a large projection screen.

The content-generation phase, ***Images of Power/Powerhouse***, uses a photo-novella technique (uses photographs to encourage participants to talk about their day-to-day lives to generate participant-authored content giving perspectives on power. In the project, 72 participants from around Ireland were sent disposable cameras by post and asked to take photographs to describe what power meant to them. As the project was seen as a story-telling opportunity for participants, it was important that the image

and comments created what could be considered a 'picture story'. Using content analysis, the large volume of 'picture-stories' were organised into themes that provide an interesting and insightful view of how people perceive sites of power as dealing with the individual's power, the power of the family, the power of connections between people and how they influence each other. It deals quite prominently with these sites of power as being very positive as they provide support and comfort to the individual within the family, home, and the larger community. The presentation phase of this work is two-fold: a) on the website *imagesofpower.net* and b) as *Powerhouse* an immersive interactive multimedia exhibit that presents a physical space where visitors can experience the complex collection of 'picture stories'. *Powerhouse* presents a mixed-reality environment comprising of the website, a presentation of the card-mounted 'picture stories', a video presentation of the 'picture stories' and an audio recording of a selection of quotes from the reflections data. The exhibit is a custom-built large room that suggests the feel and familiarity of a home interior and outside space (garden, street).

THEME 3: REACT, TAKE PART AND DEBATE

In a world where it is becoming increasingly difficult to engage people politically, communication systems such as the Internet and mobile phone communication can offer novel and exciting possibilities for interaction and communication. The three exhibits presented under this theme offer visitors different ways to communicate their thoughts and leave their mark on the exhibition.

Art of Decision Daily Post immerses visitors in a giant newspaper where they can comment on the current affairs headline of the day. The 'front page' projection screen of the newspaper is updated daily and can also be seen on the dedicated website, www.artofdecisiondailypost.net, during the exhibition. People outside the exhibition can gain access to the exhibit by sending an email to post@artofdecisiondailypost.net or using Internet-based comment board at www.artofdecisiondailypost.net. A camera is positioned to film the *Art of Decision Daily Post* projection screen. All of these modes of interaction allow a larger audience of those inside and outside the room to participate in debating the news topic of the day.

Rantroom is the last exhibit in the *Art of Decision* journey and is intended as a resting space. It encourages visitors to reaction and leave comments on any aspect of the exhibition. Visitors are encouraged here to contribute their ideas and comments on specific issues raised throughout the exhibition, such as power and decision-making. Visitors can contribute to the *Rantroom* projection screen via mobile phone text messaging, email and an Internet-based comments board on the dedicated website, www.rantroom.net.

Rite of Passage gathers images of contributors' faces and superimposes them on members of the Irish government. In doing this, it challenges visitors to think of themselves in positions of power while also gathering contributions in a creative and alternative way and offers visitors an opportunity to 'play' with their contributions to the space and the idea of themselves in positions of power. The exhibit consists of 2 spaces: a corridor-like space that masks off and leads into a larger viewing room. Positioned at the end of the corridor is an opening in the wall that contains a cartoon of the faces of members of the government. As visitors place their head inside the opening 'for a closer look', a sensor triggers a camera hidden in the box to take a photograph of their face. Visitors are unaware that a photograph of their face has been captured. These images are transferred into the large viewing room and superimposed on the heads of members of the government. As visitors continue into the larger viewing area, they see a large projection of the members of the government.

5 Conclusions

If citizens are to become more engaged, they are required to take part in an active exploration and study of citizenship at all levels – personal, local, national and global. The mixed-method approach presented here is a rich palette of tools from which to draw on, tools that offer new ways to create content for presentation and the design of engaging multimedia presentations that are brought into the community. This research has presented a fresh approach to engaging the citizen and a new tool that can be added to the repertoire of ways to understand and examine how people view their role as individuals in society, within the family and community structures. The exploration offers new ways for multimedia artists to look at the process of creation and presentation and create engaging and unique perspectives on a topic. Social research methods offer many interesting ways for the creative work of the artist to be informed and made unique and the combination of methods, and changing role of the artist in the project, is a novel approach that informs the design of exhibits to address and engage a public audience.

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DATAMAP: EXPLORING GENDER BALANCE IN IRELAND THROUGH INTERACTIVE MULTIMEDIA INSTALLATION

FIONNUALA CONWAY & LINDA DOYLE

Traditional presentations of information, such as statistics, can often be inaccessible to the public or presented in a manner that is unengaging. Art and technology offers new and alternative possibilities for presentation and audience engagement. *DATAmap* is an immersive interactive multimedia installation that presents factual information on the levels of representation in Irish State bodies, with a focus on gender balance.



Fig. 1: Representation of Dun Laoghaire/Rathdown County Council statistics (Copyright Fionnuala Conway & Mark Linnane).



Fig. 2: DATAmap - visitors interacting with information (Copyright Fionnuala Conway & Mark Linnane)



Fig. 3: a close-up of a visitor stepping on a light sensor (Copyright Fionnuala Conway & Mark Linnane)

1 Introduction

The declining health of Irish democracy has been of increasing concern in recent times with low levels of participation, poor representation of groups and in general, a disillusioned population. [1] [2] In 2006, in response to this concern, the Irish Prime Minister established the Taskforce on Active Citizenship to look at ways to encourage a more engaged and active citizenry. [3] The Taskforce have made various recommendations on ways to encourage the development of an active citizenry, including the provision of information as a way to raise awareness of vital issues of concern for citizens. Digital media and technology, used in an artistic way, offer new ways to present information that can make it more attractive, accessible and engaging. The *Art of Decision* research project and exhibition is a creative application of art and technology to raise awareness of Active Citizenship and a novel response to the Taskforce recommendation. [4] The exhibition presents a series of nine interactive multimedia rooms that invite visitors to think about Active Citizenship and their involvement in society and politics. *DATAm* is the largest room in the exhibition and presents a large volume of factual information on the levels of representation in Irish State bodies, with a focus on gender balance. This paper will first present the focus and motivation for the design. It will then go on to detail the design and creation of the *DATAm* and will be followed by a discussion of the work.

2 Focus on representation of gender balance

In Ireland, as in many other countries, there is a concern about the inequality and under-representation of certain groups (young people, women and those in disadvantaged areas) in political decision-making. While it is clear that structural changes have to be made to address the barriers to participation from these groups, information and knowledge on these issues can be used to raise awareness of these issues and engage the citizen. The presentation of age, socio-economic and gender-differentiated data is important in understanding the position of these groups in society and decision-making. In attempting to engage the citizen with information, the challenge is to make it appealing, impactful and memorable by making it personally relevant and meaningful so that the citizen feels engaged in a way that forms the basis for action.

The traditional presentation style, for example, of presenting data, such as inequalities, as numbers and statistics is often inadequate in its ability to shock, anger, outrage and, therefore, engage the citizen. Traditional media has a role to play in the presentation of this type of information but often the presentation is a compact summary of a situation at a national level situation. The citizen's experience of information presented as a summary of the regional and national level statistics can be quite removed from their personal experience in their locale and community.

In an attempt to raise awareness of the gender balance in decision-making bodies throughout Ireland, the National Women's Council of Ireland (NWC) and Department of Justice, Equality and Law Reform initiative involved the development of a life-size photographic exhibition, 'Put More Women in the Picture' depicting the gender composition of statutory bodies at national and regional levels. [5] By representing the numbers of men and women in these institutions as photographs of the actual people, the information is made more meaningful and engaging to the viewer. The exhibition has been displayed in a wide range of settings from locally based community centres to libraries and county buildings and, in situ, displays the information pertaining to the local area alongside national figures. While this presentation goes a considerable way to enriching the presentation of information such as this, art and technology offer new and alternative possibilities for presentation and audience engagement. The artist working with multimedia and technology can exploit these possibilities to present a complex view of many layers of information in an accessible and meaningful way. *DATAm* is the novel result of an exploration by the artist into how the interactive installation could be a physical platform for the presentation of the complex set of local, regional and national data on the gender composition of State bodies around Ireland.

3 *DATAm* design

The design of *DATAm* had two purposes: a) to use multimedia to visualise and represent data on the gender composition of State bodies around Ireland and b) to design a physical interface that allows visitors to interact with information through a custom-designed physical space that facilitates a group experience.

In order to point out the breadth of institutions that are making decisions affecting citizens and society, a list of key statutory bodies was made that consisted of a wide range of decision-making bodies including, but not restricted to, those of local and national government. Along with national government bodies such as the Government and Senate, city, county and urban district councils, vocational education committees (VECs), city and county development boards were included as well as boards such as the Arts Council, the Gas board and Fisheries Boards, and others that may not be so immediately obvious to the public. A detailed database of the addresses and activities of each board was then compiled as this would also be used to influence the design. Data on the gender makeup of each of the boards was then gathered by consulting various sources and by telephoning the body and was collated as the absolute numbers and percentages of men and women on each board.

At the information visualisation design stage, it was important to find some way to differentiate the information from each organisation. The activities of each board served to inform the information visualisation as it allowed the artist to visualise and realise an animated scenario in which the numbers of men and women could be depicted, and served to give each board its own identity and personality. Photography of locations where organisations are based was also used in a considerable number of the animations.

Fig. 1

The numbers of men and women on each board are depicted as pairs or couples of symbols related to the activity of the board while also suggesting a gender for each object, and are presented in an animation of a scenario or location that suggests the activity of the board. For example, the scenario presented for each city council is an animation of men as mops and women as buckets arriving to clean a city street, as seen in Figure 1. This is a light-hearted depiction of the idea of inanimate objects having a gender as the ‘gendered’ objects appear in humorous cartoons that are intended to play with gender perceptions. Alongside the animation, the information is also presented as numbers and percentages of gender composition.

DESIGN OF THE *DATAMAP* SPACE

*DATAm*ap is an immersive installation consisting of a room, built around a large-scale, interactive, colourful floor map of Ireland, designed to allow large groups of people interact with information. The room was designed as a large space, 48 foot long by 24 foot wide and with 12 foot high walls, which immerses visitors in an experience of the information and is surrounded by 6 projection screens that display the animations.

Upon entering *DATAm*ap, visitors walk onto a large-scale, colourful map of Ireland covered with sensors marked by small lights, representing the 140 points of information that can be accessed in *DATAm*ap. The overall interior design of the *DATAm*ap was intended to create a playful space where use of colour, light and materials was important. The map of Ireland is divided into areas according to colours and the area around the map, depicting the Irish sea, is covered in a blue plastic grass-like material. The animations and floor lights are the only sources of light in the room. Figure 2 depicts the space.

Fig. 2

Providing visitors with an intuitive way to understand how to access the information were a core concern in the design of the *DATAm*ap. It was important at the data collation stage to record the addresses of the boards as this information was used to allow the placement of sensors at the geographical location of the organisations. Standing on the sensors triggers the related animation to play on a nearby screen (see Figure 3). However when a visitor steps on a light, only one animation is displayed at a time.

This means that people are ‘forced’ to watch the current cartoon and wait their turn for the information point they had triggered.

Fig. 3

4 Discussion

DATAmap presents a rich experience of complex information in the form of an interactive immersive environment. It is designed to maximize the impact of the information to be displayed and to encourage engagement with the data. *DATAmap* provides an alternative, innovative and spectacular presentation of information thereby creating an experience for the visitor that is unusual, fun, thought-provoking and memorable.

INFORMATION VISUALISATION AND REPRESENTATION

DATAmap draws attention to a broad definition of the decision-making structure by presenting information on the number of men and women in a wide variety of bodies that may not typically be associated with political decision-making. For example, presenting information on government institutions is to be expected, but presenting information on bodies such as the Gas Board and Arts Council, bodies that also make decisions that affect the citizen draws attention to the wider decision-making sphere.

The use of animation facilitates the presentation of complex information as it allows three layers of information be presented in one, presenting data in the form of numbers, percentages and the creation of a unique scenario that gives the visitor some information on the activities of each organisation. The use of familiar locations in the design of the animations draws the visitor’s attention to the significance of the information in their locality or community. The use of humour and familiar locations brings the data to life, makes it more appealing and personal to the visitor, therefore, has a stronger representation in the person’s mind. The arbitrary assignment of gender generated much discussion, and this also served to encourage people to explore the room as they were curious to see how the other decision-making bodies are depicted.

INTERACTION WITH INFORMATION – THE MAP OF IRELAND AS AN INTERFACE TO INFORMATION

The map of Ireland, as a metaphor to engage with information from around the country, serves as an accessible framework that conceptually and geographically situates visitors in a landscape that is familiar to them, It is a strong visual and spatial cue to the visitor that they are being presented with information of local, regional and national relevance and helps visitors relate to their own area while also keeping an eye on the general national situation. The interaction with the space and information proved easy to learn as people could orient themselves in a space they already understood. Visitors to the space engaged quickly with the landscape and often would move immediately to a location that was familiar to them (where they lived or were born).

Providing visitors with an intuitive way to understand how to access the information was another concern in the design of *DATAmap*. In designing an interactive work with a physical interface other than the conventional mouse and keyboard, there is typically a concern that visitors may not understand the in-

terface. As the light sensors are mounted at the same location as the information point, visitors understood how to access information. The large amount of light sensors embedded in the map draws attention to the points of information and people naturally uncovered the interactive element simply by walking across the map.

The playfulness of the presentation encouraged visitors of all ages to physically engage with the information by moving and exploring the rich terrain of information. As they discovered information on a location, they became curious to discover the information in other locations to compare and contrast the information. Overall this interface provides an intuitive and familiar metaphor for visitors to understand what the space is presenting and how to interact with the information.

FACILITATING A GROUP EXPERIENCE OF INFORMATION

The scale of the room is intended to facilitate groups of up to forty people. The non-linear presentation and interaction with information through the use of sensors meant that visitors were free to move around the space and not be attached to a computer presentation. To encourage conversation and collaboration, the animations present one point of information at a time. As people waited for their turn to interact with the system, they would begin to talk to one another and this encouraged people to collaborate with each other in discovering the information. Groups of people, often strangers to each other, would begin talking to each other and discussing the animations and numbers. People would begin explaining the artwork to visitors who were trying to understand the piece. It was also observed that people would work together to compare data from different locations around the room. This collaboration seemed to reinforce the experience of the information.

A SPACE FOR REFLECTION

A crucial consideration in the design of the room was to create a large comfortable space where people feel encouraged to congregate, spend time and reflect on the information presented and interact with others visitors. The design of the space meant that the visitor was immersed in a rich visual experience. The only light in the room came from the projected animations and the light sensors. This drew attention to the visual spectacle of the animations and illuminated floor and created a strong feeling of immersion.

5 Conclusions

The role of the artist as an author of information is apparent in *DATAmag*. The artist exploits the possibilities of multimedia and new technologies to create a space for experiencing information and encouraging a playful discovery of that information. The artist exploits the possibilities afforded by multimedia and technology to maximize the impact of this information and thereby creates a new way for citizens to engage with information. There is also a conscious effort on the part of the artist to bring the artwork to the community. In doing so, the space not only represents a place for experiencing information but it also becomes a platform for congregation, reflection and discussion on issues pertaining to the community. The artwork becomes a locus for interaction and discussion and allows people to have a rich experience of issues around Active Citizenship.

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conceptual term located above individual disciplines” [5] to proposals for Transdisciplinary Universities. The panel for which this paper is presented at the ISEA, Istanbul 2011 includes Transdisciplinary Research and Transdisciplinary Practice, with a larger view to inform the Leonardo Education and Art Forum (LEAF). So, how can the education of theory, the humanities, also benefit from a transdisciplinary approach and become a Transdisciplinary Theory? What we are looking for is an undefined direction in a not yet existing world. Of the various disciplines related to the Visual Arts, Science & Technology, those who may contribute to a transdisciplinary discourse are defined or discovered by the question needing to be answered. As the needs for theory to lend its hand towards tackling a real-world problem arise, the necessary participants are determined. These participants may be separate people coming from separate fields, like in a classic interdisciplinary or cross-disciplinary cooperation, but it is the fact of focusing around a common question lying in an unknown space which transforms the interaction into transdisciplinarity. It is a co-evolution, co-creation, co-existence, co-operation all impressed today by the digital revolution.

Although transdisciplinarity is a relatively new term, there are elements of its practice that seem quite familiar. Transdisciplinarity questions focus around real-world problems that cannot be sufficiently answered by one discipline. The combination of skills and knowledge sets necessary to take on a particular question is determined by the stakeholders and the potential uses for the answer. This resembles in many ways the learning theories of Constructivism and Applied Academics. The Santa Fe Institute was created 25 years ago when a lunch group of Senior Scientists from Los Alamos had the idea of starting an institution where scientists could pursue problem-driven science (versus the usual imperatives of paradigm- or funding-driven science) directed at ‘hard’ problems. [6] The ‘hard problems’ being set forth in complex systems research needing physicists versed in chaos theory, mathematicians, climatologists, computer animators, and more. Any use of a transdisciplinary approach put towards a question of the humanities, a question of theory, would also find the necessary “disciplines” already imbedded within the nature of the question, its stakeholders, and the use of its outcome.

CONCEPTUAL MODELS

Two conceptualizations for what this space of inquiry might look like, this ‘trans’ in transdisciplinary seem fruitful to bring into the discussion. One is Basarab Nicolescu’s concept of the ‘Hidden Third.’ [7] That between the object and the subject of a problem lies a Hidden Third element that must be discovered anew each time. For the purpose of education, this means that an assignment from one year to the next, with generally the same objects and subjects, might have a completely different set of questions that arise from year to year. This Hidden Third is difficult to write into a curriculum plan, and ever more difficult to describe in a research proposal.

The second conceptualization is the historical poly-cultural planting practice of many Native American tribes who planted the ‘Three Sisters;’ corn, beans and squash. All three were planted on a mound together, the corn grew first, creating a stalk for the beans, the beans provided nitrogen for the soil, the squash covered the ground, inhibiting weeds and insects and acting as soil shade and waste recycling. Some even planted a fourth sister ‘bee weed,’ that encouraged pollination and was used for food, medicine and dye. It is possible to plant all these crops separately, requiring increased resources, but the poly-cultural system is more efficient and works even in the most difficult environments. The needs of one plant (vine needing pole,) leaves off where the characteristics of another begin; a kind of good

neighbor system. A truly transdisciplinary approach to theory would find the combination of these Sister Plants best suited for growing in the space of Nicolescu's Hidden Third.

CURRENT EXAMPLES – MEDIAARTHISTORIES AND IMAGE SCIENCE

Between formal education curricula, digital and print dissemination points, common research tools, national / international collaborations and continually developing interaction structures, a poly-cultural space for transdisciplinary theory can evolve. Two examples to be brought into the discussion are the endeavors and activities of the Department for Image Science at the Danube University during the past 5 years, and the international platform www.MediaArtHistory.org and its international conference series.

The first Media Art History conference in the series took place at the Banff New Media Institute in 2005. In the fall of 2004, a broad call for papers was announced, encouraging submissions from the following fields: *art history, anthropology, architecture, computer science, collecting, cd-rom & dvd creation, cultural studies, curating, cyberfeminism, documentation, ethnography, film studies, history of science, history of technology, image science, interaction, interculturalism, media archaeology, media art, media studies, museum direction, museum exhibit creation, nano arts, performance, photography, pop culture, presence research, preservation, psychology, robotics, scenography, science writing, semiotics, sociology, sound studies, supercomputing, teaching, theatre, videography, and visual culture*. Over 300 scholars responded and colleagues from 19 different fields presented papers at Refresh! The First International Conference for the Histories of Media Art, Science and Technology. Currently the 5th conference in the series is being planned for 2013, with no end for this transdisciplinary international conference series in sight. Focused around questions of common interest, answering the call for papers with themes bridging the spans between disciplines, the outcomes of this conference series are strong and continue to evolve. The MediaArtHistoriesArchive is the digital text repository of this new field, perhaps it is one of the newest transdisciplinary fields in the humanities created during the current digital revolution.

The Department of Image Science at the Danube University in Krems, Austria is currently the only higher learning institute of its kind conducting research and offering post-graduate studies in the field Image Science. The field of Image Science is translated in German as Bildwissenschaften, which means the study or science of the image, with "image," including everything from moving, still, historical or conceptual images. It draws from the academic pursuits in: *Art History, Archeology, Philosophy, Psychology, Ethnology, Media Studies, Communication Studies, Film Studies, Semiotics, Political Science, History of Science*, with relations also to: *Computer Science, Computer Visualization, Cognition Studies, Biology, Physics, and Medicine*. These are disciplines and theories that cluster around the image and their connections, images that cross normal academic boundaries. One of the fathers of Image Science, Aby Warburg organized his library on the "Law of the Good Neighbor" (Gesetz der guten Nachbarschaft) and gives a primary example how Image Science is a historically transdisciplinary field. As Leland de la Durantaye explains, "the various sections and the books within them were arranged as a function of their ability to engage with the books on either side of them.... Visitors to Warburg's Library are thus confronted by an enigma – so intensely that upon first entering it Ernst Cassirer declared that one needed either 'to flee from it' or 'to remain there a prisoner for years.'" [8] The complexity and ingenuity of the Warburg Library connections can be seen in Fig. 1. Resembling the poly-cultural Three Sisters, the curricula and research strategies of the Department for Image Science bring together a variety of mutually beneficial theories and disciplines based on the problem to be addressed, with a curriculum constantly evolving to

fit the needs of the field and the larger questions related to the image. The breadth of theoretical questions requiring a transdisciplinary approach demand an open, fluid and poly-cultural oriented Image Science.

DIRECTIONS NOT CONCLUSIONS

Between the Media Art History Conference Series with its archives and the research and teaching at the Department for Image Science, a path in a larger transdisciplinary direction is being developed. Both are in pursuit of an unknown future (a Hidden Third), which constantly changes course and evolves. Just as Transdisciplinarity Research and Transdisciplinary Practice can be conducive to approaching over-arching questions, so can larger theoretical questions requiring a complex system of inquiry bring together mutually beneficial theories in a transdisciplinary way.

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FROM WEIGHTLESS WORLDS TO HYBRID HOMES: RETHINKING THE EXTRA-TERRESTRIAL

LEONIE COOPER

The space station and the virtual world are worlds, both real and imagined. Questioning established ways of imagining the extra/terrestrials, this paper provides a snapshot of a poetics of thought that can situate these seemingly disparate realms in productive relation to each other in order to address the ambivalence that is activated when they are inhabited through media technologies.

Introduction: Connecting Events

In a post by General Motors on my Facebook feed on March 19, 2011, a video recording of two astronauts unpacking the crate that contained the first robot to inhabit the ISS, Robonaut 2, appeared. In itself, the posting of this video was no surprise as NASA continues to extend the theatrics of space that it first choreographed during the Space Race in the 1960s with the use of television into the realm of social media. In a manner not so dissimilar to the collective audience constituted for the Moon Landing and other subsequent events, I was asked to bear witness to another milestone in space exploration and research. Yet watching this event I was reminded of another that also occurred 'on' my computer screen only two days earlier on March 17, during which a different form of astronaut struggled into existence. After I had manoeuvred my avatar to take a seat to watch a presentation by another avatar, Archivist Llewellyn, at the *Virtual Worlds Best Practice in Education* conference in *Second Life*, I waited with the audience while the speaker attempted to 'rez', without success, in the form of an astronaut.

Speaking of these micro-events in parallel points to a larger project I have undertaken into investigating the relations between space travel and screen media including film, theme park attractions and virtual worlds. Space travel has much to offer as a hermeneutic pathway into the figuration of the film screen as a space to be navigated, but my concern here is with media habitats, and with how both the space station and the virtual world operate as such. To make this argument, however, a central problem must be faced: how to conceive of these habitats as being in a relation of mutual constitution without resorting to a form of analogous thinking that has served to insulate these worlds-that-are-weightless from the tensions that are activated when they are imagined as, often paradoxically, capable of inhabitation.

Testing out the extra/terrestrial

Within the microgravity conditions of the space station, the astronaut floats. In the video of Robonaut's unpacking, their almost slow-motion gestures as they remove the foam padding surrounding 'him' signify that their world is inherently different from that which their audience occupies. Weightlessness: it is the essential problem meant to be resolved by the psychologists, designers, behavioural scientists, anthropologists and others in the service of research into extended human spaceflight. It is also the symbolic condition that has constituted this extra-terrestrial habitat as ontologically different and enabled artists to explore what Eduardo Kac calls "antigravitropism", the capacity to create forms not constrained by gravity. [1] Even with persistent exposure to live 'feeds' from the space station, this phenomenon still fascinates as exemplified by the amount of attention that was paid to the unruly nature of

mission specialist Sandra Magnus's hair during a video call from President Obama on July 21, 2011 (designed to assure the crew that this last mission of the shuttle *Atlantis*, and the end of the American shuttle program, would not affect humankind's onward journey to the stars).

Yet, the marking out of the ontological conditions that appear to separate this world from the terrestrial has not stopped it from being imagined in terms analogous to other habitats. In studies on the effects of life in orbit on human inhabitants, research often occurs within 'space-like' environments on Earth where the terrain mirrors the harsh conditions in space and the habitats mimic the psychological and social conditions aboard the space station – the most current (webcasting 'live' of course) being at the Black Point Lava Flow in northern Arizona is NASA's 14th Desert Research and Technology Studies (RATS) mission. *The Deep Space Habitat* in the Arizona desert works in parallel to its off-world counterpart: both operating as diagnostic environments not so different to the training situations in the simulator that characterised the early days of American space travel and figured the astronaut, as Tom Wolfe ironically put it in his book *The Right Stuff*, as "a lab rabbit curled up motionless in a capsule with his little heart pitter-patting and a wire up the kazoo." [2]

Constructing such analogous relations might be necessary for research into the embodied effects of extended spaceflight but it is an epistemological process not without bias. In his study of space law, M.J. Peterson has argued that a form of analogical reasoning was key to Russia and the United States forming (at least preliminary) agreement on how terrestrial laws should apply to extra-terrestrial contexts. Whereas Russia likened outer space to the near-earth environment of aerospace, the United States advocated for an analogy with the high seas, an argument not surprising given the frontier imaginary that has fuelled the American political landscape and its discourse on space exploration. A process of "mutual persuasion" occurred, Peterson has argued, by isolating potentially useful analogies, mapping features from the source domain to the target domain (which is outer space in this case) and then transferring inferences about the existence of other features to create a model that was seen to best fit the situation. [3] To make reasonable inferences about one domain based on its likeness to another might be a process of cognitive reasoning, as Peterson argues, but the selection of the features that were inferred from the high seas to outer space depended as much on their phenomenological pull as their epistemological weight.

In other words, while analogous relations between the extra/terrestrial have been historically generated from a purportedly rational process of observation, their force depended primarily on a form of "thinking in images", a process that Michel Le Doueff argues has fundamentally informed Western scientific and philosophical thought. [4] The work of this imaginary has enabled authors such as Arthur C. Clarke to poetically figure the space station as an island floating in the sky in order to then articulate the knowledge-making processes, the 'science', that he puts to work upon it. [5] Much like Kant's island to which Le Doueff turns her attention and the phenomenological resemblances that allowed outer space to be considered similar to the 'high seas', imagining the space station as a floating island maintains the ontological difference of this weightless domain without undermining the symbolic gravity of the scientific enterprises that occur upon it.

Extending upon Le Doueff's argument, this poetics of thought enables the marking of ontological borders and yet its figurative work must be disguised. The operations of this imaginary (operating where, Le Doueff argues, it is not "meant to belong") can be traced in the video of Robonaut 2's assembly. [6] The box that contains Robonaut 2 is a microcosm of the space station itself. Unopened, it promises an array of components, neatly packaged, wrapped in plastic and Styrofoam. This chamber with its secrets

speaks of a closed hermetic world, set apart from the terrestrial in its clinical modularity. With the astronaut's hair floating like a halo as she lifts the lid of the box with seemingly little effort, its opening only testifies to the ongoing allure of this weightless world. Even when the lid is lifted to reveal that this crate is empty and no assembly is actually required, this emptiness only figures the space station as equally empty, as placeless place floating within a void.

Yet, and at the same time, this exercise is figured in terms analogous to the terrestrial. Assembling a robot might be a matter for scientists and engineers, but unpacking it is familiar territory to those who occupy the space station and who must also figuratively operate as interior decorator and housekeeper. Whether it is the familiar routine of unwrapping presents around the hearth or installing another component within the Deep Space Habitat in Arizona, the delivery of this newest addition to the ISS renders the symbolic operations that occur within this domain as essentially similar to its analogical situations.

The inherent problem with this imagining of the space station as habitat is that it perpetuates the ontological split that has informed much thought on space travel. Those who have spoken of the desire to 'go into space' must negotiate a conundrum: space is either figured as an 'imaginary' realm that enables those who are bound to the terrestrial to make sense of the symbolic and material effects of science and technology or one that tempts the so-called Earthbound into flights of figurative fancy that deny the ethical weight of lived terrestrial conditions. Thus, Constance Penley can argue in her study of NASA/TREK, a "hybrid" cultural terrain where the actuality of space travel intersects with its imaginary conditions as enacted in the television series *Star Trek*, that "going into space" is a primary mechanism for making sense of science and technology. [7] However, for others to go into space, or even to imagine so, is to fall "prey to 'ascensionism'... a general psychic orientation towards brightness, levitation, flying, climbing, upward pointing and moving." [8] Even Penley cannot avoid this trap as she begins her book recalling childhood trips to Kennedy Space Centre to watch rocket launches – a journey where what was real and what was only a dream were meant to blur. Such utopian imaginings can easily be conjured to serve the opposing argument: David Lavery, for example, recalling a dream in his critique of the desire to escape Earthbound conditions, but in his case one that was a nightmarish "nothing" ... "blank, dark and abysmal: no light shone on it from any source." [9]

Beyond the extra/terrestrial: of real-and-imagined worlds

Can the space station and the labour of those who struggle to inhabit this weightless world be imagined without reconstituting this dilemma, where the 'Spacebound' and the 'Earthbound' are inevitably split? Moreover, can a world where avatars appear be considered in the same light as one in which robots are assembled, where the first is an environment generated from software and the second capable of being physically inhabited (albeit only at the risk of physiological harm due to radiation, calcium loss, muscle atrophy and the psychological effects of isolation and cramped conditions amongst a multitude of complex factors)? It might be possible, if a cue is taken from Edward Soja's thinking on "real and imagined worlds." [10] Soja uses this term to acknowledge the materiality of physical space(s) but to also understand how such space(s) are conceived, imagined and represented. In his terms, the space station is a world both real-and-imagined. Without denying its material differences as a physical environment, life aboard the space station has always been as much a matter of *Imagineering*, to use the term employed by the designers of the Disney theme parks, as engineering. The 'space' of the station is the contemporary equivalent to the *mise-en-scene* choreographed by NASA for its astronauts and it is designed so that its temporary inhabitants are as much viewers as figures for viewing: apertures act as windows through which astronauts have viewed (and photographed) the Earth and as doors that enable them to

perform the necessary social rituals of greeting each other as they move between modules performing their daily tasks, or saying farewell as they depart back to Earth – with all such scenarios perennially on view, courtesy of NASA TV.

Moreover, the station now operates as much as a world articulated upon the computer screen as a satellite circling the Earth. This physical infrastructure compiled from trusses and girders, nuts and bolts is no longer just symbolically tethered to the Earth by the transmission and reception of data packets. In service to the techno-scientific imaginary of Western thought as a sign that the parallel trajectories of cyberspace and outer space that have been tracked from the launch of the first satellite *Sputnik 1* have finally converged, it is bound to dissolve into the kind of super interplanetary datasphere ideally envisaged by journalists when they witnessed the Jet Propulsion Laboratory choreograph the *Pathfinder* mission in 1997 as a short-term, high-visibility media event required the development of a web portal and the ability to replicate, store and transmit Martian images and information across a commercial infrastructure of 1,300 reflector sites worldwide. Moving far beyond the communications network of weblogs, LAN networks and email envisaged as necessary to keep astronauts “in touch” with the “Earth-bound” and to form a “viable” community of their own by researchers in media and communications, [11] the space station is now a fundamental component for the operations of NASA’s desktop universe; perpetually online, feeding information, images, video and animations ‘live’ to our social networks. The unpacking of Robonaut 2 – indeed, the ‘transmission’ of the video that is archived on NASA’s video gallery – is significant then for not only what it captures but its perennial availability, able to be accessed and ‘regenerated’ at each click of the play button.

If the space station is now key to NASA’s cosmos on the computer, as much online as it is in space, life in space has also become a common means of poetically rendering online, multi-user worlds such as *Second Life*. Archivist Llewellyn’s choice of an astronaut as their in-world representative is both indicative of their work as an archivist for *NASA CoLab* – an island within *Second Life* where a visitor can discover all the accoutrements of space travel ranging from rockets to lunar rovers – and the fact that the topography of space travel is now integrally embedded within the computational terrain of this virtual world. Parallels between the space station and the virtual world extend beyond the use of space-age iconography. The imaginary that has enabled the space station to operate in terms analogous to other habitats and act as a floating island set apart from terrestrial conditions also infiltrated early thought on virtual worlds. Self-proclaimed ‘pioneers’ of such worlds, during their ‘adopter’ period in the 1990s imagined them as islands floating within the oceanic vastness of the Net. With its emphasis on building, *Second Life* appears to have become the most fertile ground to establish relations with life aboard the weightless world of the ISS. Whereas the cybernaut and the astronaut might have once been rendered kin as they navigated their respective spatial realms of cyberspace and outerspace, now the astronaut and/as avatar is the configuration that enables the assembly of these worlds for inhabitation, particularly if the activities of a group of *Second Life* residents, currently numbering sixty-four, who advertise their services as “space riggers” on *NASA CoLab* are taken into account.

Soja’s term, real-and-imagined, has been invoked in regard to virtual worlds, and *Second Life* in particular, to foreground the complex spatialities emerging between online and offline environments in distinction to viewing what is built in-world, in this case artwork, as analogous to its offline counterpart in the gallery. [12] His conjoining of the real and the imagined also offers a means of recognising that the virtual world and the space station might both operate as real-and-imagined worlds without denying their unique material conditions. However, his adoption of a form of both/and... also thinking is equally important and particularly significant if the complex and contradictory processes that have constituted both these real-and-imagined worlds are to be recognised.

Conclusion: The strangeness somewhere in-between...

The task of unwrapping Robonaut was another opportunity for the astronauts aboard the ISS to perform for those 'back home' at Mission Control as they pretended to all those watching that the crate containing the robot was empty, their labour a means of making the techno-scientific matters of robot assembly familiar and fun. Consider Robonaut 2's assembly as another figurative articulation of the space station as a real-and-imagined world and the imaginary processes that have constituted it as such begin to become apparent. Yet, the epistemological work of this imaginary remains unaffected. The astronauts labour only to draw attention to that which is empty and, in turn, to a weightless realm that awaits the symbolic gravity of an analogous domain.

View Robonaut 2's and Archivist Llewellyn's acts of dis/appearance as emerging from the interstices between both real-and-imagined worlds and the poetic rendering of these worlds as weightless domains that can only be inhabited by those who are 'Spacebound' or 'Netbound' is not such an easy endeavour. In her work on "thinking in images", Le Doueff has suggested that, rather than disguising the work of the imaginary, philosophical thought should recognise the "quality of strangeness" that is necessarily activated when image-making is put into the service of science. [13] Extend such an argument to the realm of techno-science and space travel, and instances of this epistemological tension are evident. Sending men and women to the stars has always been a troubling matter: those returning from the Moon looked more like aliens than pilots; the starlight that penetrated the retinas of those bodies transported within capsules from the Earth more often rendered as displays of potential ruination than illumination whilst the figures transmitted back to Earth appeared more to be ghosts than star-voyagers. [14] This ambivalence towards the confusion of ontological and epistemological borders persists as NASA continues to design the cosmos as a kind of desktop universe. Soja's thinking is useful in that it not only foregrounds the space station and the virtual world as both real-and-imagined worlds but enables them to be situated in a productive set of relations. Such a both/and poetics of thought is important as it also points beyond established thinking on the relations between the extra/terrestrial towards the ambivalence that is activated when these strangely compelling realms are both imagined as worlds for inhabitation.

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AVOL - TOWARDS AN INTEGRATED AUDIOVISUAL EXPRESSION

Nuno N. Correia

AVOL is an interactive audiovisual project for the Web by Video Jack (Nuno N. Correia and André Carrilho). Its main objective is to allow for an integrated musical and visual expression, in a way that is playful to use and engaging to experience. In this paper, the project is presented and contextualized with related works. Its design is then discussed. Finally, results of the project's evaluation are outlined, allowing for conclusions to be reached.

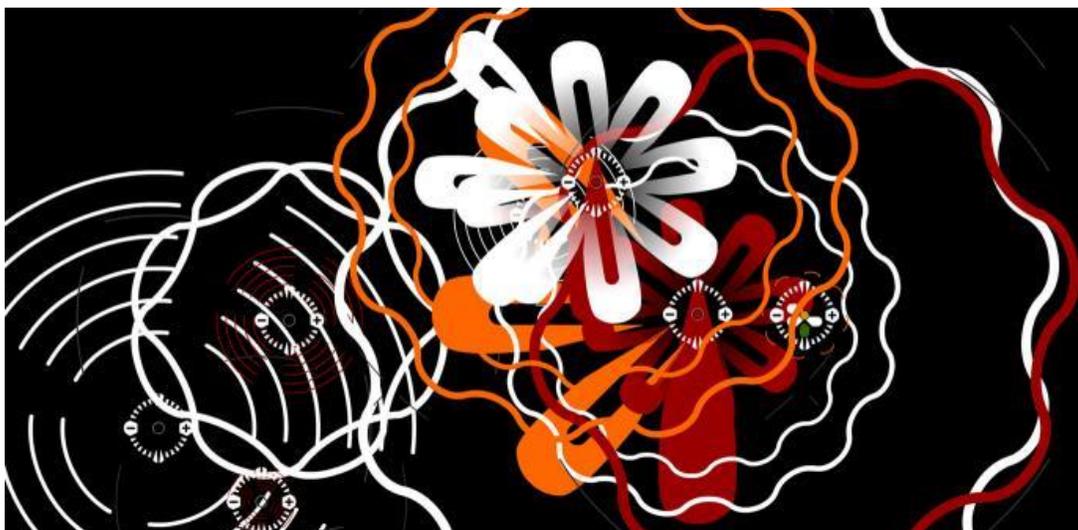


Fig. 1. Screenshot from AVOL, showcasing the second set of visuals. @ 2007/2011 Nuno N. Correia & André Carrilho.



Figure 2. Screenshot from AVOL, showcasing the third set of visuals. @ 2007/2011 Nuno N. Correia & André Carrilho.

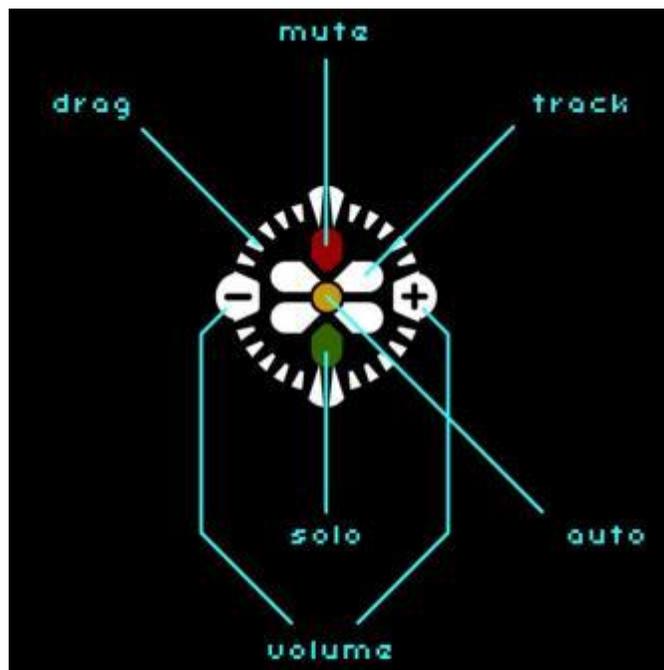


Figure 3. Diagram of an IAVO in AVOL. @ 2007/2011 Nuno N. Correia & André Carrilho.

1. Introduction

AVOL (AudioVisual OnLine) is an interactive audiovisual project for the Web (<http://www.videojackstudios.com/avol>) by the author and André Carrilho, under the name Video Jack. The programming and music were developed by the author, while André Carrilho was responsible for the graphic design and animation. *AVOL* was released in December 2007, and further developed until 2010. It was one of the four winners of a call for projects by the Arts Department (DGA) of the Portuguese Ministry of Culture for their newly created net art portal. It follows up on previous audiovisual work by Video Jack such as *Heat Seeker* and *Idiot Prince* (both 2006). The project aims to allow for an integrated musical and visual expression in a way that is playful to use and engaging to experience.

AVOL was presented as an installation at several new media festivals in 2008: Cartes Flux (Espoo), Re-New (Copenhagen), Create (London) and Live Herring (Jyväskylä). In the same year, it was also presented as performance at Abertura Festival (Lisbon) and at Electro-Mechanica (St. Petersburg). In 2010, due to the redesign of Video Jack's website (<http://www.videojackstudios.com>), and in order to better showcase the possibilities of *AVOL*, new videos and music tracks based on the project were released online. At that time, three of the music loops in the project were updated.

AVOL can be contextualized with a wide range of works that have attempted to create integrated audiovisual experiences. The pursuit of correlations between music and visuals has a long history, from Ancient Greek philosophers such as Aristotle and Plato to renaissance artists, notably Arcimboldo. [1] The development of cinema allowed for further approaches in this field. Innovators such as Walther

Ruttman and Oskar Fischinger explored combinations of music with abstract animation. [2] A new generation of artists, notably John Whitney, pioneered the use of computers to create visual music films. More recently, artists such as Golan Levin and Toshio Iwai have taken advantage of developments in computer technology and human-computer interaction (HCI) to create playful interactive audiovisual experiences. Both Levin's *Audiovisual Environment Suite (AVES)*, "an interactive software that allows for the creation and manipulation of simultaneous visuals and sound in real time"; [3] and Iwai's *Electro-plankton*, a musical 'toy' for Nintendo DS consisting of an aquatic universe "filled with different species of plankton that can produce sound and light when you interact with them," [4] were important influences for *AVOL*.

2. Project Design

In *AVOL*, the visuals and music, together with the graphical user interface (GUI) that controls them, are grouped in seven 'objects' entitled IAVOs (Interactive AudioVisual Objects). The visuals consist of abstract concentric vector animations that are audio-reactive. The reactivity to each sound is based on the scaling of the respective animation proportionally to the sound amplitude.

IAVOs contain four audiovisual options – four pairings of sound loops and animations. Therefore, there are a total of 28 interchangeable sound loops and animations in the project, allowing for numerous combinations. Each of the four content options has a differentiated character (in terms of color, shape, animation, and sound palette). In addition to buttons for triggering the four content options, each IAVO contains in its GUI buttons for: stop; solo; automatic motion; sound volume (which also affects the scale of the animation); and a draggable area.

Each IAVO has its own sonic nature (for example, 'bass drum' or 'guitar'). All sound loops have equal duration and tempo (16 seconds and 120 beats per minute respectively) and are synchronized. They were composed with the purpose of being coherent and harmonious independently of the active combination of sounds. The collision of two IAVOs triggers a custom sound.

2.1 ANIMATION AND VISUAL DESIGN

André Carrilho tried to differentiate the four content options of each IAVO with different types of shapes, using modular compositions based on one or two simple elements. After finding the basic graphic elements, he would animate them with the movement suggested to him by their shapes. The shapes also inspired the choice of color. For example, the color palette of the second animation set (triggered by the second button in each IAVO) is white, red and orange, while the one in the third animation set is blue, blue-grey and white. There was an interpretative differentiation between animations according to the nature of the corresponding sound, mainly between rhythmical sounds (the first four, counting from the left) and melodic ones (the last three). For example, in the second animation set, the four 'rhythmical' animations are based on simple circles, while the three 'melodic' ones are based on a circular wave pattern. Despite these nuances, the animations were designed to be harmoniously interchangeable. Each animation contains two elements, an audio-reactive component and a non-reactive one, in order to convey current volume level and ensure that the animation is visible even when the sound amplitude is low.

The use of vector graphics is an important element in *AVOL*. It ensures that the animations are scalable and react fluidly to sound. It also guarantees a faster loading time of the website. The animations had to be as 'light' as possible, and not too complex in terms of shape or motion, due to computer performance restraints. But Video Jack believe that technical constraints may help to focus the creative process and lead to a coherent whole.

The animations, although abstract, suggest natural shapes of different scales with a concentric nature, such as atomic, cellular, floral or planetary imagery. The visuals in *AVOL* resemble John Whitney's concentric animations. Quoting Gene Youngblood's description of one of his animations (which could apply to *AVOL*): "all colors move into the ring simultaneously from all sides, forming circles within circles all scintillating smoothly in a floral configuration." [5] There are also similarities between the 'objects' in *AVOL* and the organisms in *Electroplankton*, even more apparent when collisions occur.

2.2 INTERACTION DESIGN

The interaction design of *AVOL* aims to achieve an intuitive experience and to foster exploration by its users. As an example, the 'stop', 'auto' and 'solo' buttons within the IAVOs follow a traffic light metaphor. As Jakob Nielsen states, metaphors "can facilitate learning by allowing users to draw upon knowledge they already have about the reference system." [6] The visual design of the ring, with its rough edges, is meant to convey a 'click-and-drag' affordance. According to Donald Norman, affordances refer to "the perceived and actual properties of the thing", in particular those "that determine just how the thing could possibly be used." [7]

An important element of *AVOL* is the aesthetic integration of the GUI with the animations. The design of the GUI with its petal aesthetics reinforces the floral visual undertone.

3. Evaluation

As designer and user of *AVOL*, the author considers that the project achieved its objectives in terms of playfulness and engagement, due both to the IAVO approach of integrating audio-reactive animations with the respective GUI elements, and to the harmony, coherence and mutual agreement of the audio-visual content. However, the author detected several shortcomings in *AVOL* that constrain its potential for creativity and expression. After the release of *AVOL*, Video Jack started designing a new project that would address these issues. In 2010 the new project, entitled *AV Clash* (<http://www.avclash.com>) was released. Following this release, the author planned a questionnaire to users of Video Jack projects, including a section comparing *AV Clash* and *AVOL*. This section would allow him to evaluate if his initial conclusions regarding *AVOL* would be confirmed by users.

3.1 AV CLASH – FOLLOW-UP PROJECT AND BENCHMARK

AV Clash intends to solve some of the insufficiencies detected by the author in *AVOL*, mainly its scarce audio manipulation options and its limited amount of sounds and visuals. In order to access a larger amount of sounds than *AVOL*, *AV Clash* connects to [Freesound.org](http://www.freesound.org), an online sound database. Approximately 240 sounds from [Freesound.org](http://www.freesound.org) are used in *AV Clash*. The project also contains a larger number of animations (96) than *AVOL*. Audio manipulation capabilities include audio effects ('echo' and 'filter') and sound trimming. [8]

The sound character of *AV Clash* is substantially different than *AVOL*: the sounds are not synchronized; they have different durations; and they have a much more diverse nature, ranging from field recordings of nature and voice recordings to synthesizer sounds. Some usability improvements were introduced, such as color-coding of IAVOs and usage of 'info tips'. Nevertheless, there are several common elements between *AV Clash* and *AVOL*: a similar visual style (abstract concentric vector animations); a similar IAVO approach of integrating sound visualization with GUI (although the number of IAVOs was reduced to four due to performance issues); and the same audio reactivity behavior, based on animation scaling.

3.2 QUESTIONNAIRE AND RESULTS

In the first half of 2011, an online questionnaire was setup to evaluate *AV Clash*. The questionnaire contained closed and open-ended questions, and was answered by 22 anonymous respondents. It included questions comparing *AV Clash* with *AVOL*. From the answers to these questions, important insights can be reached regarding *AVOL*.

AV Clash seems to have been more successful than *AVOL* in terms of engagement. Approximately three quarters of the test users (16) have spent more time interacting with *AV Clash* than with *AVOL*. Half of the users (11) attributed this to the additional manipulation options. Approximately two thirds (68%) of the respondents consider the possibility of accessing a larger amount of content in *AV Clash* to be appealing, against 27% who do not. One of the users is indifferent. Half of the test users consider the additional audio manipulation options in *AV Clash* to be interesting, against 18% who do not. Nearly one quarter of the respondents are indifferent. These results show that users value the additional content and functionalities of *AV Clash*.

When asked which project had a more enjoyable sonic and musical approach, 41% of the test users chose *AV Clash*, against 32% who prefer *AVOL*, with 27% enjoying equally both. The test users who preferred the sounds in *AVOL* mentioned the synchronization of the loops, the curation of sounds, and the inclusion of percussive elements as factors for their choice. Regarding ease of use, 36% of respondents consider *AV Clash* to be more intuitive, whereas an equal percentage of users reply that *AVOL* is easier to use. 27% consider that they are on the same level regarding intuitiveness. When asked the reasons behind their choices, six out of the eight users who considered *AVOL* more intuitive mention the simpler interface and fewer options as the reasons for their choice.

The majority (59%) of the respondents considered that *AV Clash* gives a higher feeling of creativity than *AVOL*, whereas only two users chose the latter. Nearly one quarter of the test users answer that both projects are on the same level regarding this issue, and two users do not get a feeling of creativity from either. From the 13 respondents who consider that *AV Clash* gives a greater feeling of creativity, seven mention more manipulation options, and another one more variety in sound, as reasons for their preference. One of the test users who consider *AVOL* to offer a more creative experience mentions that the sounds "fit together nicely", adding that switching between them created interesting results. From the respondents who were indifferent to or dissatisfied with the level of creativity allowed by these projects, one user considers that both projects shape the sound and visuals too much to allow for his/her own creativity, and another mentions that the projects are "too structured".

4. Conclusions

Despite the low number of respondents to the questionnaire (22), some useful insights can be reached regarding *AVOL* and interactive audiovisual projects in general. The results from the sections of the questionnaire comparing *AVOL* and *AV Clash* confirm the insufficiencies detected by the author in the former: the limited content and the few manipulation functionalities result in less creative options and a more restricted expressiveness. The majority of users consider that *AV Clash* gives a higher feeling of creativity. It was successful in achieving a greater engagement than its predecessor because of its additional content and media manipulation capabilities.

However, extra manipulation options and added content come at a cost in terms of usability: *AVOL* achieves similar results to *AV Clash* in terms of ease of use, despite the attempted improvements in interaction design. Moreover, *AVOL* comes close to *AV Clash* in terms of sonic enjoyment. Although more users (41%) manifest preference for the audio in *AV Clash*, a significant amount of users (32%) consider the synchronicity, coherence and harmony of sounds in *AVOL* to be more pleasant. Therefore, even though the majority of respondents favor *AV Clash*, there seems to be a significant number of users who prefer a simpler project such as *AVOL*, with fewer options and content, but with curated and more harmonious sounds.

Some of the users are dissatisfied with the creative and expressive potential of both projects, considering that they are "too structured" and shape the end result too much. Further developments in this line of projects could address these limitations, expanding the manipulation options, content, and customization possibilities. This path would concentrate on expanding the creative potential of interactive audiovisual projects as tools. Another possible path for *AVOL* would be to concentrate more on playfulness and intuitiveness, targeting users who prefer a simpler and more curated approach.

In future developments, the author considers that emphasis should be given to recording and sharing capabilities. Net art audiovisual projects such as *AVOL* should take advantage of their online presence to facilitate the recording and distribution of user-generated content, namely by leveraging social media. The author also believes that multi-touch mobile devices are attractive for future interactive audiovisual projects, since they allow for a more direct and flexible manipulation of visuals than a pointing device interface.

In the author's opinion, there is a large potential for creativity and engagement in *AVOL*'s path towards an integrated audiovisual expression, where "composer, performer and audience converge in the playing subject." [9] The results achieved so far show that this path might develop into separate branches, exploring different balances between expressiveness and playfulness.

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‘FORSCHERTRIEB,’ THE INSTINCT FOR RESEARCH: TOWARD A QUEER PSYCHOANALYSIS AND A PSYCHOANALYTICAL QUEER THEORY

Diego Costa

Linking the curiosity of the theorist to their sexuality, the paper argues for a Queer Theory (re-)turn to psychoanalysis, and its tradition of theory-based practice and practice-based theory, a move which must place the unconscious (of the object of study, of the researcher and the research) at the forefront of the research process.

The analyst’s job is to facilitate the analysand’s freedom to choose what he would like to do with his desire[1]. Whether that desire is ‘good’ or ‘bad,’ that doesn’t concern the analyst. This analytical imperative entails the same critical opposition to the reductions of the self to namable identifications, conditioned by all sorts of moral-socio-political enterprises, that is supposed to ‘drive’ queer theory. Although it is a popular caricature to mistake psychoanalysis’ ability to recognize certain systems of ideality for its condoning them, similar queer critiques against compulsory reproduction (of babies and workers, or baby-cum-workers), the irreplaceability of the couple, the ills of consumerism and even the evils of the “university-government-clergy-nobility” can be found in the vast, multi-faceted and dynamic psychoanalytic literature.[i]

An engagement with psychoanalysis is a political engagement in line with, to the surprise of some, Foucault’s utopian politics of bodies and pleasures. It is easy, for the psychoanalytically uninitiated, to take Foucault’s figures of 19th Century power-knowledge – “the hysterical woman, the masturbating child, the Malthusian couple and the perverse adult” – as jabs at a psychoanalytical project, which, at least partially created these figures. However, that would be to confound psychiatry, psychology and psychoanalysis into one big monster, and mostly, to ignore psychoanalysis’ “progress” throughout the 20th Century and to mistake its recognitions for prescriptions.[ii]

Foucault’s envisioning of that potentiality of desire(s) somehow unbound by a pre-made tautological relationship to objects, free to roam around like *flanêurs*, against what he called the “deployment of sexuality,” is perhaps the unseen link that can suture both queer and psychoanalytic projects[2]. To insist on not seeing that conduit line may mean to keep on tripping over it, and allowing it to knot up and around the researcher’s own desire for truth of her object of study. For, as we know, any analytical project that demands its truth without accepting its risks is one fated to be a victim of its own perversions. The desire of the theorist, or the “instinct for research” (*Forschertrieb*) or knowledge (*Wisstrieb*), whose first signs are known to coincide with the sexual life of children’s “first peak,” is too often missing from queer work’s considerations, although it is never absent. And we would do well in recognizing the desire of the (queer) theorist, always already a (sexual) sublimation vying for some kind of mastery, precisely when it takes the shape of such symbolic reluctance: where is, for instance, the theorist’s dealings with her own “counter-transferences”?[iii]

This is not to say that queer theorists haven’t included their own selves, consciously and not, whilst producing their work. I am suggesting, however, that we would benefit from a more calculated, and strategic, awareness of self-implication in conducting research that is akin to the extensive work that psychoanalysis has created concerning the analyst herself as a desiring subject. The branches of Queer Theory that resist a psychoanalytical approach often reveal a blinding U.S.-centrism in their claims of

Austria-centrism against psychoanalysis itself, along with the history of a certain sublimation that comes with “I,” including strategies to control the personal risk inherent to the research, keeping it from contaminating the researcher herself, or exposing an always already contaminated researcher.[iv]

We know that all research activity begins at the moment it is aroused by sexual activity. And that the act of seeing, or finding out, is an extension of the act of touching. They are linked to the Freudian theory of perception, which views it (the faculty of perceiving) “as consisting of a sending out of feelers, of sensitive tentacles, at rhythmic intervals.”[v] The researcher’s research may function, then, as a kind of “propping,” much in the same way Freud describes Leonardo da Vinci’s drawings as “props” for his anatomical investigations, an alibi-practice that enables other kinds of practices, investigations and discoveries.[vi] Jean Laplanche describes sublimation, which appears as a doing “something else” with sexual energy (sometimes in opposition, sometimes working together with sexuality), as an instinct of “excessive strength [that] triggers the earliest childhood sexual theories,” the first of which revolves around: “Where do babies come from?”[vii]

Laplanche gives the example the mother’s pregnancy of another child as igniting that puzzling question. It provokes an investigation linked to a fantasy of construction faced with the parents’ refusal to come up with an adequate answer, establishing a connection between sublimation in the form of having-to-know and “turning back,”[viii] or what Heather Love may call “feeling backward.” This problematic question, emblematic of the drive to research, sets forth a traumatic relationship between the infant’s intellectual inability to discover the answer and the level of the problem being confronted. It also discloses the way the ‘will’ to know ‘now’ harks back to the ‘need’ to know ‘then.’

It is interesting to note that here the child’s being confronted with a “other,” the soon-to-be sibling in the womb, throws her in a queer position that drives Laplanche to liken children to Martians. Except that for a Martian, the most puzzling question, when parachuted on Earth would be, as far as Freud is concerned, the difference between the sexes (garb, behavior, social functionings). For the child gender difference is a natural “given from the beginning” (*‘von Anfang an’*). But what if the gender question is not a natural given for a child who may, also ‘*from the beginning,*’ occupy a place of queerness that exceeds the “normal” queerness of every child? If we follow Laplanche and Freud’s scheme of investigation-and-research as sublimation (sometimes a compulsion, ‘*Zwang,*’ sometimes a substitution for the sex act, ‘*Ersatz*’) triggered by a puzzling question borne out of a sexual curiosity, how does a previous unsettling of the gender difference “natural given” complicate the order and properties of things? If “the source of the itch” for a queer child, or a proto-queer researcher (beyond the “normal” queerness of every researcher), either precedes the one in the unmarked child or is there at all, what role does that play in the way certain researchers cathect their object of research?[ix]

I mention Laplanche’s points here not to suggest that queer theorists, or Martians, might be more invested in knowing (whether it be where babies come from or where ‘*they*’ do), but to illustrate how in “falling backward” during research one, inevitably, realizes how much is at stake for oneself as a researcher, which reveals a layer that is part and parcel of the research itself – perhaps its crux.

I am proposing a queer theory turn to psychoanalysis, and vice versa, because theoretical work that doesn’t place the unconscious at the forefront of its approach is one destined to the crevices of its own narcissism -- the narcissist subject, of course, being one who cannot accept her own susceptibility of loss nor the absolute alterity of the other as other, all intolerable things for a Queer project.

References and Notes:

- i. Lucien Israël, *La Jouissance de L'Hystérique*, (Paris: Éditions Arcanes, 1996), 202. All translations are mine, unless otherwise noted.
 - ii. Michel Foucault, *The History of Sexuality: An Introduction – Volume 1*(New York: Vintage Books, 1990), 105.
 - iii. "(...) the instinct for knowledge in children is attracted unexpectedly early and intensively to sexual problems and is in fact possibly first aroused by them." Sigmund Freud, *Three Essays on the Theory of Sexuality* (Basic Books, 2000), 60.
 - iv. On American moralism, sublimation and misuse of psychoanalysis see Henry Abelove, "Freud, Male Homosexuality, and the Americans," in *The Lesbian and Gay Studies Reader*, ed. David M. Halperin et al. (Routledge, 1993).
 - v. Jean Laplanche, "To Situate Sublimation," *October 28* (Spring, 1984).
 - vi. Sigmund Freud, *Leonardo da Vinci and a Memory of His Childhood*, ed. and trans. James Strachey (London: The Hogarth Press, 1957).
 - vii. Laplanche, 20.
 - viii. Laplanche, 17.
 - ix. The desire to know is a kind of safe space where libido escapes to, *from the beginning*, from repression. Sublimation, then, avoids the formation of neurotic symptoms by channeling libido into the drive to research. It is always "precocious," in the sense that it occurs at the very same moment as "the first incidence of sexual excitation, at the moment of the emergence of the first vague or partial sexual drive." Laplanche, 17, 19.
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PHOTOGRAPHY'S FALSE PROMISE

DAVID COTTERRELL

David Cotterrell discusses the abstraction of distance and the dislocation of ideas. From the comfort of knowing in London to the disconnection of the frontline in Afghanistan and back again for an image-frenzied art public in Britain, he offers a personal perspective on the image, the lens and the implicit lie of the narrative structure.



Fig.1. Sightlines, 2009, David Cotterrell, C-Type Print. © 2009 David Cotterrell.

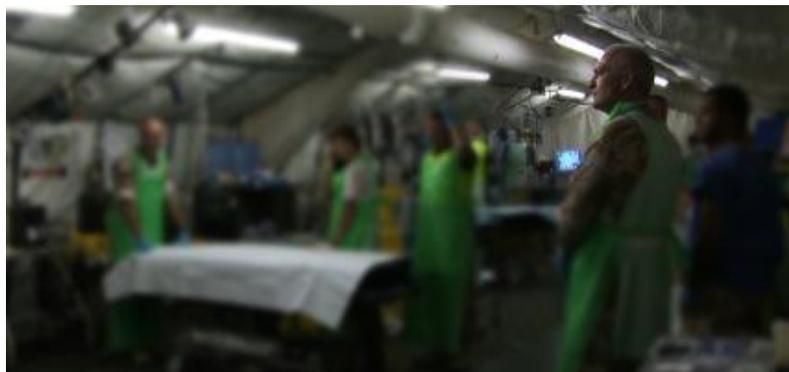


Fig.2. Green Room, 2009, David Cotterrell, HD Video, 22mins. © 2009 David Cotterrell.



Fig.3. Supernumerary, 2009, David Cotterrell, C-Type Print. © 2009 David Cotterrell.

As I traveled from Brize Norton in rural Oxfordshire to the Commando base at Sangin in Helmand Province, my view shifted from a media-informed assumption of global understanding to a diminishing, narrowing perspective. I had printed internet-sourced maps of Helmand, bought a 'Lonely Planet' guide to Afghanistan and attended military briefings in Yorkshire. The morning of my departure I read a copy of The Guardian, loaded my camera gear into an army-surplus Bergen and entered the military environment via a C-17 Globemaster.

Arriving in Kandahar 24 hours later, I was taken to Regional Command South, where I was guided through maps of the war as defined by British engagement. Kabul did not appear on these charts. I progressed to Camp Bastion (this time by the smaller Hercules transport plane) and my new home, 201 Field Hospital. At 'Prayers', the morning intelligence briefing, an annotated chart covered the table. As well as the familiar battlefields of Kajaki and Sangin, it had the names of places I hadn't seen on any of my printed maps: 'Bryce', 'Delhi', 'Dwyer' and 'Inkerman'. The map was centred on our current location, with concentric circles emanating from the hospital. No miles were marked – distances were now measured in Chinook flight-times.

I was amazed by the detail of briefings: suicide bombers tailing convoys were described, the locations and probability of attacks over the coming 12 hours were declared, but the world beyond a forty-minute flight was no longer referenced. The last news I had seen included reports of the potential for martial law being declared in Pakistan. We heard rumours of problems in the country as our breakfast milk supply had dried up – the result of Taliban ambushes on supply convoys crossing the border.

I decided to try to find a newspaper. Post did come to Bastion, but had to compete for space with ammunition, medical supplies, reinforcements and military equipment, so the papers I found all preceded my arrival.

Two weeks later, I had been unsettled by the claustrophobia of Bastion and the death and injury I witnessed. I begged passage on a Chinook, first to Lash-Kagar, then onwards to Sangin. While Lash-Kagar offered the welcome opportunity to discuss the abstraction of political challenges to governance and progression with Foreign and Commonwealth Office officials, Sangin was a forward base occupying contested territory in the poppy-growing region, populated by 40Commando's 'Bravo' Company and a mortar team from the Coldstream Guards.

My ambiguous status (I had been awarded the title of 'Major' in order to travel with the Army, but was an odd addition to the military with my ponytail) enabled my attendance at intelligence briefings. These still lasted an hour, but the scope was further reduced: the horizon now was not flight-times but the range of foot-patrols. We knew the names of the Taliban commanders who were camped on the hills around us and were even aware of rumours of rivalries and intrigue amongst them. Within a couple of kilometers we had a vivid detailed mental picture. The rest of the world, Kabul and even Kandahar, was now abstracted beyond comprehension.

I remained in Sangin until the end of November, stranded as helicopters were diverted to support the attack on Musa-Kala. I had to wait until my return to the UK to read news more current than the date of my departure a month earlier. I discovered that Pakistan hadn't yet descended into chaos after all and only one of the soldiers that I had witnessed being injured had made it into the press-released history of the conflict.

I had an interesting challenge on returning from Afghanistan. I had travelled as a 'War Artist' in an attempt to investigate the apparent ethical contradictions between Medicine and War. I now had a thousand images of conflict and its bloody aftermath and was invited to present work in a public exhibition concerning the subject. Outwardly, this might appear to be a simple problem of editing and selection. Inwardly, I was struggling with what I had experienced, as well as witnessed.

I was asked to offer an independent observer's view of the trauma of front-line field hospitals, the ecological impact of conflict, the role of NGOs in construction and masterplanning within transitional environments (amongst other subjects that I am under-qualified to offer expert analyses upon). After the novelty of my experiences had been exposed, documented and discussed, I was asked to explain how a tangential and aberrant experience such as that offered to 'War Artists' can be reconciled with a longer-term practice as an artist.

With no great confidence, but with some intuitive feeling, I said that I had recognised a few parallels.

I had realised, as I tried to recount my journey in a chronological narrative, prompted by my projected photographs and the memory of my scribbled diary, that one of the most profound experiences of advancing forward through the military supply-lines was of a gradual disengagement with any perceivable macro-picture of context.

When required to contribute to the canon of mediated knowledge and demonstrate my understanding of truth to a wider audience, I chose to speak from the vocabulary of received secondary experience. Perhaps a focus on the dramatic and catastrophic impact of violence on the human body would have been appropriate. This aspect of war was vividly documented within the record of my time in the Afghan operating theatres. But this imagery, which I recognised as representative in my research in the UK, was not congruent with my memories of Afghanistan. The images I held in my memory were of gore and despair, but the traumatic nature of my recollections was not rooted in the inherent shock of the visual. The distance I was feeling from my colleagues, friends and family on my return to England was due to a memory of the calm, silent and slow experience of isolation, disorientation and uncertainty, which I had perceived to pervade the open-ended narratives that begin at the moment of injury. Media images of guns being fired, protest placards of bloody injuries and the smug ironies of contemporary art statements, focusing on digestible, if unpalatable, ideas that could offer mass gratification, failed to offer a fellowship with my private demons.

I chose to make work that deliberately denied the salacious appetite for drama. The work was to focus on the mundane, abstracted and ambiguous experiences that remain un-newsworthy: the interminable, night-time evacuation flights, the uncertain waiting for casualties, the abstraction of trauma through codified military terminology and the administrative burden of death and injury. When previewed, my responses naturally bemused some cultural commentators. While war correspondents, serving soldiers, recent casualties, veteran doctors and nurses seemed to empathise with the material I had introduced to the public domain, there was a palpable sense of disappointment from the art journalists who had visited the work seeking a satisfying and definitive response.

Writing in *Art Monthly*, one journalist appeared to lament the restraint with which the artwork addressed (or denied) the emotive potential of the traumatic first-hand experience. Having read my diary extracts reprinted in *The Guardian*, he was aware of the material potentially available for synthesis into statements for art-world consumption. Yet, the work presented offered nothing but a bleak and

uneventful representation of the period before and after the politically sensitive and personally devastating experience of military injury.

The parallels with my existing practice, identified while cathartically recounting my journey through the casualty chain of Afghanistan in front of a London audience, were not derived from the extremity of experience, a political critique or of a relationship to process. Rather, the congruity that I felt with my longer-term artistic practice was with a realisation of the consistency of fragmentation between personal and collective narratives. The illusion of linear history has been well-explored through the writings of Christopher Hill and other left-wing historians, who acknowledged that a national history could only ever be an illusory approximation superimposed across disparate local experiences.

I found in Afghanistan that immersing myself in the reality of an experience previously perceived from a mediated distance naturally led to the collapse of the authority of the summary analysis. The reduction of contextual peripheral vision appeared directly proportional to the increasingly vivid primary experience of conflict. The dramas and rationales for policies, campaigns and battles fragmented to become visible only as contradictory, arbitrary violent incidents. As empathy was gained with individuals, faith in the ability of history or politics to transmit the rationale for, or the reality of, suffering appeared to dissolve.

The contradiction between the macro and first-person view, which I had previously assumed to pervade all experience of politics, urbanization and domestic life, had been the subject of my practice on a regular basis: I had developed work to address the abstraction of planning and urban analyses. While recognising that slogans and statistical data were unlikely to represent my personal experience of love, life or bereavement, I had still naively consumed the comforting, iconic summaries offered by the media; had unconsciously accepted a seductive documentary response to aspects of life that I had previously challenged.

The cinematic documentary view, or Kino-Eye, has an internal logic, but like the rules of perspective within two-dimensional drawing, does not provide a record of reality as much as an alternate construct. The lens offers a virtual world devoid of experience. It shows us too much – flattening perception and reducing the impact of all information to a common level. We survey rather than engage. Photographic composition offers a perceived hierarchy of characters and events. We are guided to the dominant narratives through the editing of footage and denied the more mundane sub-plots hidden beyond the camera's depth of field.

The fixed frame of content within the rectangle of the screen is reminiscent of the aesthetics of memory, but it doesn't replicate corresponding subjective emotional states. While photographs illustrate a visual record of the world, the sustained roving of gaze, focus and the dominance of analysis, they do not automatically transmit a state of terror, melancholia, or sublime, which may have been tagged in our memory with reference to an original image.

Instead of abandoning the fallacy of the format, we are encouraged through the dominance of media delivery mechanisms to work within the frame, to allow visual material to dominate sensual understanding and to seek to deliver content which references and perhaps challenges the precedents and conventions of the medium, rather than challenging the validity of the format itself.

I felt that to actually focus on the reality of a moment, a level of manipulation, intervention and perhaps even fiction, might be required. *Green Room* is a small video question – one of a series generated in response to the problematic experience of being a witness in Afghanistan.

The film recorded preparations for the arrival of multiple casualties during a major incident, but it is not pure documentary. I had set the camera up on a tripod within the recovery ward, unsure whether I would be able to cope with the events that were about to transpire. It offered a substitute witness that could offer an objective position from which to review the narrative at a later date.

In fact, I had managed to be present for the treatment of wounded and had travelled with them to operating theatres and through the initial stages of their onward evacuation. The camera's silent role appeared to have been unnecessary. It wasn't until much later, when I returned to England, that I looked at the tape.

The narrative is clear. Nothing appears to happen until the sound of helicopters beyond the tented hospital is heard and British and Afghan soldiers and civilians, strapped to gurneys, begin to arrive. The clinical environment is overwhelmed by the dust of the desert, the armoured medical escorts and the steady, urgent response of the surgical teams to the challenges confronting them. Had I been behind the camera, I would have determined the lens's focus.

The camera had been set to record with the maximum depth of field and neutrally surveyed the interior. The apparently unimportant activity in the background was also rendered visible: the anxiety of observers as they waited to be instrumentalised; the attempts at levity to distract from the bleak anticipation; the shift of focus as they viewed the enormity of their imminent task. I chose to direct attention by reinstating a limited depth of field on what I believed were equally important but naturally overlooked aspects of the traumatic experience.

The manipulation of view takes place after the fact: a simple post-production device is used to selectively deny focus. The loss of definition thwarts our natural desire to understand the dominant narrative. We are left with sharp images of the mundane, the redundant and the waiting. I had interfered with the documentary record and manipulated the footage.

For me, this had been one of the most profound realisations of my time in Afghanistan: despite recognising the aesthetics and contextual references through media familiarity, I had failed to remind myself that the gradual assumption of knowledge gained from exposure to synthesised reality rarely prepares the viewer for the inevitable contradiction between mediated and primary participation. I was reminded of conversations with my grandfather, who often told me that war was mainly boredom, punctuated by brief periods of fear. However, I had not understood that the undocumented intervals between dramatic events were also dominant and emotionally charged experiences.

Rather than remain satisfied with a synthetic alternative, artists need to challenge our media to regain the initial experience. By accepting the impossibility of providing an objective macro-view and by considering the limitations of the documentary witness, perhaps we can compensate for the inherent error of the Kino Eye, its false narratives and its great illusion of truth.

References and Notes:

This paper was developed by David Cotterrell following a period of research commissioned by the Wellcome Trust. Cotterrell's work was enabled by the Ministry of Defence, who facilitated his stay at Camp Bastion in November 2007, and was further supported by the RSA, who invited him to stay in Kabul for a month in early 2008 in order to view an alternative aspect of Afghanistan.

PUBLICNESS, PERVASIVE TECHNOLOGIES AND A HISTORY OF SHIT

GEOFF COX

If modern power is founded on conditions of the management of human waste (as Laporte argues in *History of Shit*), can we say the same of software? This issue is crucial for a fuller understanding of political expression in the public realm and the ways in which sociality is ever more privatised through the use of pervasive technologies.

If language is beautiful, it must be because a master bathes it - a master who cleans shit holes, sweeps offal, and expurgates city and speech to confer upon them order and beauty. (Laporte) [1]

There has been much recent interest in revisiting Hannah Arendt's ideas in relation to a reconceptualisation of publicness. She states (in *The Human Condition*, written in 1958) that the political realm arises out of acting together, in the sharing of speech and action. [2] In Paolo Virno's work, further recognising the linguistic and performative dimension of capitalism, the connections are emphasized because of the relative ineffectiveness of political action today, which explains the current "crisis of politics, the sense of scorn surrounding political praxis today, [and] the disrepute into which action has fallen." [3] Can the same be said of publicness? What is at stake for Virno is clear, that "if the publicness of the intellect does not yield to the realm of the public sphere, of a political space in which the many can tend to common affairs, then it produces terrifying effects." [4] Proprietary technology arguably plays a significant role here in distancing speech from affect in a situation where action and words have lost their power (to echo Arendt).

To put it differently, in Christian Marazzi's writing on the relations between economics, language and affect, there is little hope for effective action when people have become incapable of maintaining concentrated attention on the same object for a long time. [5] Extended to intellectual and social behavior, Franco Berardi calls this a catastrophe of modern humanism, where we no longer have sufficient attention spans for love, tenderness and compassion. [6] As language and affect become increasingly economicised, social attention is captured with dire consequences in terms of the subjectivities being produced (and this is the terrifying effect of the so-called attention economy). According to Berardi, only the autonomy of intellectual labour from economic rule can save us from the forces of capitalism (or 'semio-capital' as he calls it). The point is emphasised in the current attack on Universities – although of course this is part of a broader neoliberal assault on public services, welfare and education. Moreover, Berardi is invoking general intellect and the social function of intellectual labour, what Virno refers to as the "know-how on which social productivity relies." [7] Aspects of socialism and general intellect are incorporated into what Virno calls the "communism of capital." [8] In other words, the social potential has been stolen from the public realm and commodified.

Again, Arendt is invoked through her assertion that publicness should be understood in terms of plurality not singularity per se. This is evident in speech and action in that it both represents the capacity for equality and distinctiveness. [9] To Arendt, action is bound with the expectation of the unexpected that results from the sameness and uniqueness of human plurality leading to the creations of publics and counter-publics. The political realm arises in this way, out of acting together in this way, but crucially this is expressed as a collective activity, preempting Virno's description of the many tending to common affairs.

But what of communications technologies more specifically in as much as software can be seen to represent both expression as in speech or writing (or word and deed) but also something that performs actions? For Christopher M. Kelty, again referring to Arendt, the free software movement is an example of emergent and self-organizing public actions. [10] Underpinning this is the sharing of source code, rooted in the history of the UNIX operating system and its precarious development between the public domain and commercial enterprise characterized by the parallel developments of free software and open source in the late 1990s. The history reflects the paradoxical forms mentioned earlier in which technology's social potential is captured.

More optimistically, the cultural significance for Kelty is captured by the term 'recursive public' to account for the ways in which the public is: "capable of speaking to existing forms of power through the production of actually existing alternatives." [11] The intervention extends a definition of a public grounded in discourse (as with Arendt) – through speech, writing and assembly – to other legal and technical layers that underpin the Internet in recognition of the ways in which power and control are structured – to include both discourses and infrastructures. [12] In this way, recursive publics engage with, and attempt to modify, the infrastructures they inhabit as an extension of the public sphere (his example is the case of Napster). Thus publicness is constituted not simply by speaking, writing, arguing and protesting but also through modification of the domain or platform through which these practices are enacted.

The intervention of Dominique Laporte, in the *History of Shit* (first published in French in 1978), is to verify that modern power is founded on the aesthetics of the public sphere and in the agency of its citizen-subjects but that these are conditions of the management of human waste. [13] He insists that in parallel to the cleansing of the streets of Paris from shit, the French language was similarly cleansed of Latin words to establish official French without "foreign leanings" (according to an edict of 1539). Both public space and language were cleaned and policed in parallel, as purification requires submission to the law (as the Laporte quote at the beginning of the article asserts). Thus he contends that language was purged of its "lingering stink" to become purer and invested with authority, "elevating it to the divine place of power freed from odor." [14]

The desire for clean language, as well as clean streets, sublimates shit and demonstrates an expression of new biopolitical forms of control over subjectivity (including the bodily functions of speaking and shitting freely) and one where the market has become sovereign (rather than the State). Can we say the same of clean code, and that the kinds of technologies that are found on the streets (installed in mobile devices and such-like) are similarly cleansed? Is it that the technologies made available to us are simply not shit enough?

Service-based platforms (so-called cloud computing) provide an example of a purified form in a similar way, disputing Kelty's optimistic statements about free software as there is no code to share – as software and network services merge into one platform through which people access the internet using their mobile devices and tablet computers. This is the Apple paradigm of software development with specially conceived proprietary "apps" (for iPhones and iPads) that close off users from the underlying impurities ('stink') of code (through the cleanliness of iTunes for instance). These developments are crucial for a fuller understanding of the suppression of political expression in the public realm and the ways in which general intellect is becoming ever more privatized through the use of pervasive technologies and free market logic. The point is that human capacity is wasted under such conditions. This is the waste that the valorisation process leaves behind, and the consequences of over-production are there

for all to see as more and more environmental pollutants are dumped around the world as a consequence of the demands of ever-expanding communications industries.

The argument of the paper is that the commodification of social potential evident in the apps that currently pervade our lived experience might be open to further transformation. Kelty describes the radical possibilities of "argument-by-technology and argument-by-talk." [15] Taking the Hegelian move from in-itself to for-itself further, via class consciousness or class for-itself in Marx's adaptation, Virno combines it with Gramsci's concept of the organic intellectual to characterise "mass intellectuality". The interlinking references help to assert Virno's line of argument that the publicness of the intellect is not a positive public force unless it is at the same time recognised as political. Repeating another earlier point to conclude, only the autonomy of public intellectuality in its separation from the free market can save us. The health of an organism can be detected in its shit and current mismanagement is clear for all to see.

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6. *Franco 'Bifo' Berardi, Precarious Rhapsody (London: Minor Compositions, 2009).*
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8. *Ibid., 110.*
9. *Arendt, 176.*
10. *Christopher M. Kelty, Two Bits (Durham: Duke University Press, 2008).*
11. *Ibid., 3.*
12. *Ibid., 50.*
13. *Laporte, op cit.*
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This research has been funded by the Danish Council for Strategic Research, 09-063245, (Digital Urban Living).

DON'T HATE THE BUSINESS, BECOME THE BUSINESS!

Geoff Cox & Tatiana Bazzichelli

This introduction to the panel investigates some of the interconnections between art, activism and business. "Don't hate the media, become the media" was one of the slogans of Indymedia. We are applying this critical hands-on perspective to the business framework to explore the concept of disruptive-innovation.

"Don't hate the media, become the media" was one of the slogans of Indymedia. In adopting the phrase, the idea is to apply this critical hands-on perspective to the business framework to examine how artists, rather than simply refusing business logic, are producing critical interventions from within. Indeed as the distinction between production and consumption appears to have collapsed, every interaction in the info-sphere seems to have become a business opportunity underpinned by informational capitalism and the perceived importance of the creative industries to the economy (the so-called 'creative economy', where creativity is effectively instrumentalised). Therefore, the creative intersections between business and art have become a crucial territory for re-invention and the rewriting of symbolic and cultural codes, generating political actions or social hacks that use a deep level of irony but also have unexpected consequences. The tactics demonstrate the permeability of systems — that these can be reworked — and more so, that radical innovation requires modification of prevailing business logic.

The backdrop of the Istanbul Biennale and the art world/market makes a useful reference point here as one of the markers along with art (trade) fairs in general for the commodity exchange of artistic production and the intention to boosting the local economy: "economic development and culture as part of a trade and investment portfolio" as Maya Balcioglu explains. In the local context, the almost exclusive model of private patronage rather than State subsidy for the arts indicates a growing trend for the art world as a whole, and its overt business orientation. But examining such trends are not new issues — as there have been many examples of artists making interventions into the art market and alternatives to commodity exchange — and we aim to discuss some of the recent strategies that have emerged from a deep understanding of informational capitalism with its enduring paradoxes.

More detail on the particularities of the information economy is what Elanor Colleoni provides with attention to its stress on the capture of social aspects and the pluralization of the concept of value. The mechanisms for generating value from intangible assets, or the ways in which it can be made tangible, takes new business forms and these are somewhat exemplified in the case of social media. The concern is how particular kinds of social relations are monetized, which sets the context for Dmytri Kleiner's notion of 'Venture Communism', an intervention that offers a model of workers' self-organization to allocate wealth using a peer-to-peer model, offering: "commons-based collaborative and shared forms of cultural production and economic distribution." Artistic interventions such as this, perhaps provide the "most innovative business models" as Christian Ulrik Andersen and Søren Bro Pold argue, but also reveal a "conceptual gap". There are many examples of new models but the central paradox is the focus here: that on the one hand, there are alternative or disruptive business models that derive from the art scene, often as critical or activist interventions, but on the other how these practices can be easily co-opted by proprietary business logic. The question is how to take this back: expropriate the expropriators.

The paradoxes are exemplified by the IT business idea of disruptive-innovation, where disruption is considered to be a creative act that shifts the way a particular logic operates and thus presents newfound opportunities for investment. If, in general, it appears that innovation has become co-opted, Paolo Virno offers a rather different interpretation (partly to avoid using the problematic term creativity) through his use of the phrase "innovative action," to describe the ways that humans demonstrate the ability to modify their forms of life. [1] He is developing the point that innovation both produces contradictory factors that reflect the human condition, its creative energies and their repression, but that it also provides opportunity for further reinvention. We propose to do something similar with the term business: and it is worth remembering that the term itself, business, simply indicates an occupation, and one undertaken with both care and anxiety (in its etymology) and is not pejoratively capitalistic.

If the economy is increasingly characterized by its linguistic characteristics and social cooperation, as Virno insists, language becomes the means for transmitting data and for innovative action. When it comes to digital work, there seems to be a changed relationship between conception and execution in this respect, in that the work is conceptual and is then enacted materially by the instructions that are produced by a machine. [2] Citing Virno, Christian Marazzi in *Capital and Language*, further develops this linguistic dimension as a mechanism of control: "Biopolitics exists where the foremost priority, in immediate experience, is given to what belongs to the potential dimension of human existence: not the spoken word but of the faculty to speak; not work actually done but the generic capacity to produce." [3] The goal of government becomes the generation of certain types of collective speech acts and competition within markets becomes an important foundation for a critique of social media and the ways in which the energies of peer production have been expropriated from the public by the market. In this sense, the vague marketing distinction between web 2.0 and web 1.0 is just another example of capital recuperating the democratic potential of a new technology for the privatization of public assets (as Kleiner also points out). [4] It sells the public what it already owned in the first place.

There are endless examples of platforms that extract value in this way from social creation but thankfully there are also others that try to hold on to it, further reinforcing the connection that Marazzi makes between financial markets and collective speech acts (as with P2P credit cards and other initiatives that speculate on the future of money). [5] The current austerity measures in global economies seems to underline the urgency for producing alternatives, as public services are eroded by the neoliberal logic of financial capitalism. The problem remains how to develop alternatives that do not simply function as innovation for capitalist renewal, how to innovate beyond the market?

Like innovation, disruption is a rather ambiguous concept. In the business culture, disruption does not mean only rupture, but innovation and re-design of behavioral tendencies. The concept of disruptive business represents a paradox because it demonstrates a process that interferes with business, but at the same time, it generates new forms of business. Since the avant-gardes, artists concentrated into the effect of producing the unpredictable, while generating new forms. Today, neoliberal business logic has embraced the unpredictable too, encapsulating disruption and co-opting alternatives. The paradox lives in the encounter of business culture and artistic disruption.

The intervention is to apply the business concept of disruptive innovation back again into the art field, and at the same time to develop a critical perspective on the concepts of disruption and innovation. The challenge becomes how to be aware of the business logics and mechanisms, introducing unexpected incongruities in the capitalist structure and provoking unpredictable feedback. In a scenario where business has largely co-opted the values of hacker ethics and social networks, and where the forms of criti-

cism tend to freeze as soon as they emerge, the way out from the impasse might be found within business itself. An examination of the paradoxes lies at the heart of this, in an inversion of old schemes of contradiction, and through the direct involvement of multiple and diverse subjectivities that react strategically and playfully from within. Art becomes business disrupting the neo-liberal marketplace.

The various contributions that follow explore these paradoxes and provocations: Does this mean that well-meaning critical strategies of artists and activists are self-defeating? How do we develop disruptive business models that do not simply become new models for business that ultimately follow capitalist logic? We maintain there is nothing wrong with doing business as such, it just needs to be better.

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This research has been funded by the Danish Council for Strategic Research, 09-063245, (Digital Urban Living).

SKYPE AND VIDEOPERFORMANCE: RELATIONAL SCREENS

CINZIA CREMONA

This paper argues that Skype communication on the one hand, and videoperformance on the other have been converging into a set of art practices that adopts the screen as a relational device informed syncretically by the qualities of both practices.

The project *Skype Me!* sits at the convergence of videoconferencing with two art traditions: performance-to-camera and networked performance practices.



Skype Me!, 2010, Cinzia Cremona with Terry Smith, live Skype collaborative performance. Copyright of the artist.

Introduction

This paper examines an instance of art practice that utilises Skype as a platform for videoperformances.

I have been exploring the foundations of a theory of the relational screen in the context of videoperformance art practice. The core argument of this paper is based on the observation that the relational qualities of networked screens in peer-to-peer communication and of videoperformance reciprocally inform each other's relational potential.

This paper argues that Skype communication on the one hand, and videoperformance on the other have been converging into a set of art practices that adopts the screen as a relational mediator informed syncretically by the qualities of both practices.

Overview of Skype Me!

Skype Me! took place in August 2010 in the context of an artist residency and solo exhibition at firstsite (Colchester, UK). This project was driven by a set of research questions to problematize the crossovers

between videoperformance and screen-based communication. The structure of the project was deliberately open to the emergence of features to be discussed in the context of videoperformance and recent relational approaches to contemporary visual art.

In August 2010, I invited a number of artists to contribute remotely via Skype - I left the invitation intentionally open to elicit a variety of responses. This productive variety allowed me to analyze a number of features of screen-mediated relationality on the boundary of communication, performance and relational art practice, and to highlight synergies and crossovers between the use of screens in networked communication and in videoperformance art practices.

Some examples

Choo Ly Tan's contribution, a presentation about the inventor Walter Josef Steinerson, culminated in a minute silence in memory of the subject. As the talk progressed, Steinerson emerges as a fictional figure and a catalyst for political satire and performance. Especially evident in the recording of the interaction between myself and Choo Ly, this fact becomes progressively embodied in my own expressions and reactions. In particular, the moment I realise the ploy unfolding in front of me, my facial expression changes visibly, and the connection between Choo Ly and myself comes to life. This simple observation points to a relational *space* between the screens within which the work takes place.

Daniel Lehan, an experienced and prolific live performer, admitted to using Skype for the first time. Daniel simply performed a text-based work as he would for a live audience. Andrea Giulivi connected from Italy to recite a touching poem by Giacomo Leopardi wearing a mirrored Futurism-inspired mask. The contrast between the high poetry and the grotesque attire suited the paradoxes inherent to Skype-based art practice – low resolution/intense performance; geographical distance/visual closeness. These practices adopt the screen as a vehicle for the delivery of the work, and ignore the particular connotations of the videoperformance setting, and the triangulation with viewers in the gallery. Conversely, the artist Terry Smith had devised a small work to suit the low bandwidth of his connection, and framing the keyboard of his computer with an independent camera, typed noisily on the keys with one finger.

The painter Corinne Charton took the invitation to a different emotional pitch with a very intense message to her younger self. Corinne had not prepared any performance, and asked me to tell her what to do. In conversation Corinne responded with interest to the idea of leaving a personal message for her younger self. Corinne appeared attuned to the paradoxical qualities of *Skype Me!* - the combination of liveness, intimate connection between the two sides of the networked screens, and the delay afforded by recording.

The next section will discuss two of the artists' contributions in more detail. These instances convey more directly the potential for a creative focus on videoconferencing affordances and limitations within visual art practices. Corinne Charlton's personal message reflects Skype's core paradox of complementing relational presence and physical absence. Marsha Bradfield's penetrating conversation helps uncover some of the conceptual dynamics of the project itself. It also highlights the relational openness that can be created by projects that soften the separation between public and private approach to communication.

Corinne Charton

During our introductory chat, Corinne Charton focuses on the lack of eye-contact in our Skype conversation. 'I can see that you can't see my eyes, but I'm desperate to look into yours!'. Corinne expresses her initial discomfort with emotional intensity, but later in the conversation cannot avoid addressing me instead of her younger self, until I switch off my webcam. After having delivered her emotional message to her own screen/webcam, Corinne acknowledges that only after 'I left' – but I have only left her visual field – she can now address her own image and her absent younger self.

I would argue that, contrary to recorded videoperformances, the live networked screen of videoconferencing conveys direct connections and relationality despite the lack of eye-contact. Conversely, it could be argued that mediated eye contact [1] is an indispensable component to activate the relational effectiveness of the screen in videoperformances, and at the same time that it depends on the complicity of viewers. The familiarity with the televisual convention of eye contact adopted by newsreaders and early television continuity announcers enhances the relational power of the recorded moving image through a sense of liveness. On the basis of my own videoperformance practice, I would also argue that this screen-mediated relationality is often activated at the production stage by evoking an imagined viewer as present beyond the camera. I use the video camera and screen as relational tools from the inception of the work by already addressing the viewer long before the performance becomes an image on a screen in a gallery and meets the gaze of others. At the stage of performance, the lens of the camera is the substitute for the viewer.

Seeing the other is an integral part of the experience of videoconferencing; therefore it is expected that interlocutors will be looking at the image of the other on the screen, and not straight into camera. This tacit agreement sidesteps the need for mediated eye contact, and highlights the effectiveness of the screen as a mediator of relationships. By being the last interface of a networked system, the screen offers a visual proof that the other is there *now*. In videoperformances that directly reference networked real time communication, the viewer becomes a substitute for the interlocutor only at the latest stage of the process – when the videoperformance is displayed on screen in the gallery.

These pragmatic observations about videoperformance and videoconference practices suggest a wide range of questions that concern the practices of screen mediated relationality and their ethical implications. Power imbalance between the interlocutors on and off screen, issues of seduction and perceived intimacy, the lack of reciprocity, and the more general debate on the traps of conviviality in relational practices, all echo in the questions raised by this project.

Marsha Bradfield

Marsha and I are both member of the research cluster Critical Practice, supported by Chelsea College of Art and Design (University of the Arts, London) . Formed by artists, researchers, academics and others, Critical Practice activates participatory events to research in practice issues of organization, governance and knowledge production within the field of culture. Marsha's art practice and research focus on dialogue, as she adopts a 'combination of participatory and collaborative models to create more participant-authored works of art.' (Bradfield, 2007). Calling from the privacy of her family home in Johannesburg, Marsha engaged in a critical conversation that contested the context of *Skype Me!* as an instance of art practice:

Marsha Bradfield: I'm wondering if you could say something about how this for you is performative? How is the way you are behaving now different from how you would in the privacy of your own home?

Cinzia Cremona: In one way, I am literally in the window of the gallery. Knowing that I am visible from the street makes me feel that I am performing for a large, random audience. The second way is that I am in a public space – anybody could walk into the gallery and talk to me about this. But they will also be your audience. You are not only talking to me. Then, this is being recorded. And I'm doing this as a subject of research – I'll be thinking about the difference between Skyping with you here, talking to you on the phone, seeing you in a meeting, or going for coffee with you. I'm also going to reflect on how this can be shared with someone else.'

Marsha's interview-style conversation pressurized me into articulating the dynamics of the project as it was still in process. I find this a valuable element of this experiment, and a quality of the platform itself – the potential for meta-discourse during the production of the discourse itself. In other words, the same structure that materializes the research questions, also nurtures reflection on the structure and the questions themselves. This becomes a generative process as the contribution offer stimuli for the project to change as it progresses. Moreover, the potential for other interlocutors to benefit and/or contribute to the process keeps the project open to active participation. Left alone with a member of the audience, Marsha engaged in a conversation about who is the public or audience of the project with Caroline, an art student who entered the gallery. Caroline listened for sometime, taking notes and photographs. When I was called away, Marsha and Caroline continued the conversation:

Caroline: I'm interested in the concept of me being the audience, listening to this Skype conversation that I wouldn't normally be listening to. You two were having a talk publicly, even if you are actually doing it privately. I find this quite an interesting concept. This is new phase ... as well as it being performative between you and the artist.

MB: Something that I fascinated by is: are you he public? Are you the audience? Am I the public? In a way this project is contesting those distinctions, or certainly problematizing them.

Caroline: I don't feel like I'm the public right now – I feel like you are the public. But I am also watching you. In a sense you are the art piece. But then there is public going past the window ... It's a different situation; one that I haven't thought about before. Maybe there is a new concept in there.

MB: I still find the idea that this is performative problematic. For me it's complicated to speak about this in terms of performance. In terms of a practice, I don't know for example how I might talk about this as being something different from, say, my teaching practice, or my interpersonal practice – the way that I communicate with my friends and family.

Caroline: I see this as more *relational* – at the more performative end of relational aesthetics. We are building relations as two strangers in a public atmosphere, in a sense. Maybe what I am doing now is more spontaneous than a planned performance, but I think this is a cross section between a more spontaneous understanding of performance and a planned, thought out one.

Throughout the 1990s a number of thinkers adopted phenomenological approaches to examine how screens mediate intersubjective encounters. Peggy Phelan and Amelia Jones concentrate on the body of

the viewer and how this shapes the perception of the body represented on the screen. Taking this concept further, Jones (1998) proposes that 'the video screen *becomes* the skin/the body' (p. 200). These authors share an interest in theorizing the dynamics of subjectivity as constructed in interactions between the subjects themselves. Screens fulfil this process by acting as psychoanalytic mirrors (Phelan, 1993), and recalling the fact that the body is already a screen for symbolic projections. In this reciprocal relationship, the formation of subjectivity is the focus of these phenomenological discourses. The relationships activated by the encounters between screens and bodies/selves are instrumental to the emergence of subjects and not the focus of analysis.

Similarly, Laura U Marks (2002) developed a theoretical concept of haptic images^[2] as images that 'do not invite identification with a figure so much as they encourage a bodily relationship between the viewer and the image.' (p.3). Whilst Marks proposes a narrow definition of haptic images as low resolution, fragmented and difficult to read – as these qualities move viewers' focus towards the surface of the video as if this was its skin – she also offers a theoretical premise to articulate the relationality mediated by the screen. Referring to Sobchack (1992) and her understanding of 'viewing as an exchange between two bodies' (Marks, 2002, p. 13), Marks conceives of an act of viewing in which 'both I and the object of my vision constitute each other.' (p.13) Both Marks and Sobchack develop their argument on phenomenological premises of an embodied viewer in-the-world (Sobchack, 1994), but it could be argued that they also transcend phenomenology by conceptualising screens and moving images as relational and active in themselves.

The publication of *Relational Aesthetics* (Bourriaud, 2002) marked the development of a parallel discourse, which has no roots in psychoanalytic or phenomenological thought. Not an academic conceptualisation of relational issues, but a collection of curator Nicolas Bourriaud's statements about emerging approaches in contemporary art practices, this text has nevertheless crystallised the association of the term *relational* with a particular set of contemporary art projects. Bourriaud generically defines the term relations as 'relations outside the field of art (in contrast to relations inside it, offering it its socio-economic underlay): relations between individuals and groups, between the artist and the world, and, by way of transitivity, between the beholder and the world.' (Bourriaud, 2002, p.26).

Despite the vague meaning given to 'relations with the world' and 'human relationships' throughout the book, *Relational Aesthetics* makes a strong case for the performative relational power of art practice in general and moving image works in particular.

In parallel with Bourriaud's concept of Relational Aesthetics, Grant Kester (2004) has developed the more politically engaged idea of 'Dialogical Aesthetics'. Based on ethical principles derived from Bakhtin and Levinas (p. 118), dialogical practices also sustain a sense of subjectivity built through face-to-face dialogue. Kester maintains that this approach 'requires that we understand the work of art as a process of communicative exchange rather than a physical object.' (p.90). Whilst Bourriaud promotes art practices that engender convivial relationality, Kester focuses on overtly political interventions in the fabric of the community.

Bruno Latour (2007) has provided an effective analysis of face-to-face and mediated interactions in the context of Actor-Network-Theory (ANT) (pp. 199-203), in which are described as generally distributed, mediated and interfered with. Within an ANT approach, inanimate objects and animate beings with a will are considered equally as actors (active agencies within a network of events) (p.63). In other words, a face-to-face encounter constitutes only one possible iteration in a chain of mediated encounters. Coming to the question of relationships from a very different angle, Latour offers a hybrid form of sociology

that denies direct affiliations to philosophical thought. The relationality proposed by ANT is pragmatic and performative – it does not exist unless it is being enacted.

The public Skype conversation with Marsha and Caroline articulates these concepts in practice, and throws wide open the question of reciprocal influences between the screen-based tools of communication and of contemporary art practice.

Conclusions

The project *Skype Me!*, paradoxically materializes a core quality of the crossover between videoperformance and videoconferencing – the potential for the work to exist both *on screen* and *between screens*. Although some of the works were not designed to conform to Skype's characteristics – the artists regularly perform the same piece for a live audience – the dynamics and timings of the exchanges, the mixing with conversational modes, and the blurring of the distinction between private and public materialize a relational engagement rooted in the exchanges uniquely mediated by the screen.

By conflating the practices of videoconferencing as communication and as videoperformance art practice, *Skype Me!* contributes to research in both fields – the practices discussed here propose the networked screen in videoperformance and in peer-to-peer videoconferencing as a device for mediating relational responsibility.

[1] This expression describes a paradox, as one set of eyes encounters a representation of eyes instead of another present gaze. I would argue that the screen functions very effectively as an interface as it conveys this representation, allowing the represented eyes to become performative in a relational context.

[2] 'Haptic *perception* is usually defined as the combination of tactile, kinesthetic, and proprioceptive functions, the way we experience touch both on the surface of and inside our bodies. In haptic *visuality*, the eyes themselves function like organs of touch.' (Marks, 2002, p.2).

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WORKERS OF THE FUTURE AT THE FRONTIER OF A PIVOTAL WORK: INNOVATION AT WORK

Marie-Michèle Cron

One can either compare invention and creativity in a relation based on reciprocity and elective affinities, or highlight their distinctiveness: the first is driven by inspiration; the second depends directly on its being applied, or further still, on a notable difference between the process and its result.



The Year's Midnight Shadow Box 5, 2011, Rafael Lozano-Hemmer, High resolution interactive display with built-in computerized surveillance system, Copyright Antimodular Research

A question of identity

For over ten years now, the Montréal digital scene owes its development to the effervescence and convergence of socio-economic factors and specific policy initiatives which emerged in the 60s. As Québec was marked by the rise of new technologies and interdisciplinary transgressions, it was also immersed in a singular socio-historical and aesthetic context. Montréal was, and remains to this day, the seat of the sedimentation and blossoming of innovative forms linked to so-called media arts, since they also encompass independent cinema and video. These appeared during the deep social changes, an atmosphere of revolt and quest for freedom proper to the *Révolution tranquille* fostered. The major technical innovations, such as the availability of marketed portable video and sound recording devices, encouraged artists and citizens to make their voices heard, consolidated their feeling of identity, and conditioned contemporary creations to participate in the manifestation of a powerful collective imaginary. Here, the use of media as new means of expression and tools of artistic creation can be explained by the population's density within urban agglomerations and geographic isolation, two factors which certainly contributed to promote a highly efficient telecommunication network.

We cannot overemphasize the role that the stakes, both financial and symbolic, of digital culture as a whole represent and constitute within the sphere of the new creative economy. Also, it will be useful to see how the innovation's potential plays a role in digital creation itself and how it partakes in the elabo-

ration and consolidation of a sector that is a central component of the concept of a creative cultural metropolis. The binomial innovation/creation opens the way for new spaces and networks of sociability, a cluster of creative communities made up of innovative nomads.

What is innovation?

As a general rule, innovation emerges when there is an improvement in an already existing product through a higher performing product: here the newness becomes one of the added values to be brought to a research area or a discipline, and to the set of goods, services and shared uses in a chosen context. One can either compare invention and creativity in a relation based on reciprocity and elective affinities, or highlight their distinctiveness: the first is driven by inspiration; the second depends directly on its being applied, or further still, on a notable difference between the process and its result.

That being said, if interpretations regarding its nature differ, innovation is bound by its very nature (often misunderstood), to its context of emergence which may be delayed due to multiple factors (human and non-human), and to its social impact. Its components refer to a change in the object's function and status, the emergence of new ideas and their implementation, in fact, to everything that touches on the notion of progress, be it social, technological, or economic, or even of a gesture that brings an added value to an organization or company.

As for artistic innovation, it would permeate several production spheres, contaminating other work areas through the imagination, games and even creative anarchy. [1]

If innovation is generally associated with the world of industrial research and the emergence of new products and methods revolving around competition and profit seeking, paradoxically, this notion is less present in the art world: yet, aren't values such as self-reliance, freewill, originality and risk-taking, also its *raison d'être*? How do the digital arts metabolize the innovation that influences both the creative cities linked to the new economy?

Digital artist: worker of the future?

A "laboratory artist" [2] or worker of the future, a researcher-expert in his chosen field, the digital artist is changing the face of art by overcoming the physical obstacles which may arise when art meets technologies based on constantly renewed and fluctuating data. The digital artist possesses mixed and non-conventional skills in combination with a very open mind and professional flexibility: he is versatile and knows how to renew himself. By way of science, technology and art as generators of new expressive forms, he can thus exert an influence on the world of affects and the sensible, but also on the dissemination of new theories and new concepts. In the digital arts, innovation is exercised in the invention of dissemination platforms and interactive extension prostheses; the spatio-temporal involvement of the other in the new discursive and textual spaces; architectural reconfigurations by way of light and sound; reactive textiles; new scenographies which fuse real and virtual beings; synesthetic audiovisual projections and performances; the *détournement* of the functionality of everyday objects; novel and poetic combinations between high and low tech.

As Pierre-Michel Menger underlines:

"The arts and the entertainment industry, like all innovation producing and consuming sectors, constantly give rise to new professions and new professional identities, and correlatively, to the redrawing of the boundaries between existing specializations." [3]

One must be cognizant, however, that the digital is still a genre which is subservient to the technical and that this incursion into the territory of others is not all smooth riding, for this new type of researcher-creator must know how:

"to mix academic research, artistic innovation and the valorization of flexible products oscillating between artwork, tool and knowledge." [4]

The paradigmatic shift from the tool to the aesthetic object (is computer-produced art really art?) and the artist's role as the sole master and agent of his work but who works with others - who in a sense become deferred authors - raises questions of an epistemological order. One wonders, and quite rightly so, about the validity and legitimacy of artistic production and the interpretation of works resulting from it; the democratization of their use and the physical, intellectual and emotional implications for the user; their finality and their reception effects, as well as the place of these works within the symbolic field of contemporary art. Digital artists appear to be in a delicate position between two realities - they are part of a communicational aesthetic all the while redeploing the conventions belonging to the visual arts domain proper.

As versatile creators they create visualization devices, reflect on how to more actively integrate the viewer in their creation process and artwork, and adopt a panoply of intellectual positions while working in groups and through shared networks. The digital arts also bring about a feeling of belonging between the author and the viewer, which may be based on a game and action logic: in this case, the work coexists thanks to the physical or virtual, but mutual, participation of the actors. The protocols established by the artists thus lead to a dialogue about the aesthetic, conceptual, game, and bodily aspects, but also about phenomena that involve the viewer's contemplative and imaginative faculties.

It is the case of Melissa Mongiat, [The User] and Rafael Lozano-Hemmer. As much in their aesthetic aspect as in their dialogical approach, their works indicate also one dimension that is characteristic of the digital arts which is the dynamics of the exchanges and distribution between various actors and their evolving context.

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TIME TO LIVE

Sean Cubitt

Poets are the unacknowledged legislators of the world.

(Shelley, Defence of Poetry, 1821)

Programming is a poetry for our time.

(MJ Hibbett)

The dominant media of the 21st century are now in place: spreadsheets, databases and geographic information systems. Evolved from double-entry book-keeping, from the early adding machines and filing cabinets of the first office revolution, and from the maps that guided the first wave of European imperialism. All three share a move away from origins in chronological ordering. Time is being squeezed out of contemporary media. We need to look hard at its position in digital technology. The moving image media begin with succession – one frame after another – adding the interlaced and progressive scan with the invention of video. Digital imaging brings with it the clock function in image capture and processing; and the introduction of the time-to-live principle in packet switching, which ensures undelivered packages erase themselves so that they do not clog the system. Time is integral to digital media, far more so than to their mechanical predecessors. Vector graphics are a startling example of the potential of this temporal specificity. However, vectors are both constrained by the universality of raster displays, and redeployed in video codecs as a means for managing and controlling time. The aesthetics of digital time cannot be separated from its political economy and art that is digital needs to pay attention to the materiality of digital media, and the politics and economics that define them, especially in the moment of IPv6, HTML5 and the MPEG-LA patent wars.

I want to say only one thing today: that time is of the essence. The repression of time in the dominant media is a characteristic of the digital age. At the same time, the emergence of new forms of digital temporality at the technical level demonstrate grounds for hope that a new relationship with time can emerge. But then again, there are institutional and economic pressures fighting to maintain the atemporal character of our times. The struggle between space and time is the meat and potatoes of digital media. Let me try to explain.

It is was for many years a truism of film and other media studies that we live in an era dominated by the hegemony of illusionistic and narrative media. Avant-gardes struggled for abstraction, and for non-linear and anti-narrative modes of working. Meanwhile, it was becoming apparent that the development of neo-liberal finance capital on one hand and bio-political management of populations on the other had formed a new political economy whose foundation is a new aggregation of media.

I pause here to make a theoretical point. We have learned from the Marxist tradition, as much as from the very different theses of neo-liberal ideology, that the economy is the foundation of society. The rival claim, most cogently voiced by Foucault, is that power – politics, governmentality – is the formative agenda of social life. Both share the belief that there is a foundation. Some forms of feminist and green politics have similar structures: patriarchy, Gaia, or the relations between genders or to the natural environment are key to a good many variants of both. It is important however to understand that these terms – market, polity, patriarchy, nature – are abstractions, as indeed is the term 'society.' We need such high-level abstractions in order to make arguments and discuss values, but we should not mistake them for materially, physically present facts. It is impossible to see a market, pick up a polity, or shake hands with nature. What we can, what we must do, is enter into relationships with human and non-human others, mediated through gesture, money, art, and bits. Mediation is the material form of power: what Foucault refers to as its 'capillary action,' the media through which authority travels from rulers to ruled, or resistance to power acts against rule. Mediation is the material form of exchange made concrete in the exchange of metals, bills, and now of bits, as well as of the material goods and services which we call the economy. A market is a complex collection of mediations between people and raw materials, factories and corporations. Mediations comprise the whole gamut of devices, from clothing to surgical intervention, which make the relations between genders materially significant. Furthermore, the relations between people and environment are not mental abstractions but enacted through the physical mediation of toxins, pollutants, husbandry and forestry. Both power and economy require media to complete their tasks, media without which they cannot function. Mediation names the material processes of interconnection, influence, reverberation and communication which, in specific formations and at specific levels of abstraction we call power, economy and so on. So much for the theoretical preamble. Mediation requires media, and those media have histories, which shape the digital forms that now in turn shape our world. (FN: There's not room here to make the argument that this is not technological determinism: mediation is not just machines but practices, nor is the relation linear causality, but the networked relationships which mediation mediates).

The dominant media of the 21st century are no longer story and picture but the three pillars of the political economy: spreadsheets, databases and geographical information systems. It is the task of digital arts in this century to address the peculiar qualities of these dominant media forms, and of eco-critical thinking to demand better, but first we need to analyze how they are constituted. The best way to do that is to analyze how they came into being: how their characteristic forms of action derived from earlier technologies and practices. This has the additional virtue of giving us some traction on how we might retrofit abandoned practices, and how to recognize genuinely new ones, to hasten the development of new media formations: new art, but also a new political economy, new human relationships, and new relations with the organic world.

It may well be that writing itself began in Sumer about 8000BCE in record-keeping for contractual purposes. For centuries across Old and New Worlds, various means of keeping tallies proliferated, and from them derived much of our mathematics. Double-entry book-keeping, providing a schematic record of profit and loss, was first formalized and published by Bartolomeo de Pacioli in 1494. The ledgers used at the time were narrative in form, in the sense that they began at the beginning and were ordered

chronologically. It was only the invention of new mechanical aids like adding machines and cash registers that changed this narrative form.

Much the same is true of the ancestors of databases. Ledgers recording the duties owed and redeemed by peasants to their feudal lords, of vassals to their sovereigns, and later daybooks recording the activities of the Spanish and Portuguese empires of the 16th and 17th centuries, and in factories and the emergent poor schools and hospitals of the 18th century, were written down in the order of their occurrence. Parish records of births, marriages and deaths were written as they happened, the writing part of the ritual life of the village. In this instance, the invention of the filing cabinet allowed a new kind of order: one based on arbitrary systems like the alphabet. These made retrieving information simpler, but did so by abstracting the acts described from their place in the order of time. Instead, date became a system as arbitrary as alphabetic order.

The mechanization of book-keeping and maintaining files went hand in hand with new media like calendars and diaries made popular by mass printing (Gitelman). The temporal order of exchanges recorded in the old ledgers was now rapidly being transformed into a spatial order; and that order was being matched to a cellular grid extending into the future as well as the past, matched to a conceptually infinite succession of days and of cells marking the advance of time, leaving behind the semantic cycle of monkish hours. Like the conceptually infinite succession of future transactions – notably the command and control of debt – and the filing cabinet as instrument of rule, calendars and diaries helped compose the rectilinear and conceptually infinite grid of contemporary spreadsheets and databases.

Accountancy and record-keeping involve essentially human relationships. The map, however, extended the range of power in the age of the great navigations and the first precursors of globalization and colonialism, to control over geography. Map-making completed the first great act of modernity, the alienation of land from the people who live in it which was at the most profound – and also most destructive – achievement of feudalism. The translation of typically lateral observation into typically flat representation, and of the curvature of the Earth onto 2D surfaces, created magnificent leaps in the geometric arts, and objects of great beauty. It also provided the rulers and colonists who were their chief market with a God's eye view of the planet. Many of them bore, and still bear, the trace of time in the form of trails or markers for historic monuments, or on older maps markers of risk and bounty: Here be Dragons, X marks the spot. Many maps trace historical boundaries and the shifting tides of empire. Maps do not exclude time, however they can subordinate it to space. In the 18th century, ubiquitous adoption of the systematic grid of longitude and latitude could predict, like a calendar, the indefinite extension of space into realms unvisited by Old World navigators – Terra Incognita. This was the first step towards the absolute map. The second belongs to the digital summa of the three great media of modernity – accounting, filing and mapping: Geographic information systems, GIS for short.

GIS compiles the data we have on populations and maps it against environments. When Foucault speaks of power mediating between populations and environments, he might almost have been speaking about

these massy software suites, where not only what we know, but extrapolations from the present into imaginary futures, are organized into communicable calculations. GIS allies the powers of these three media with the calendar to provide the perfect instrument of rule: a simulator of consensus and dissent, conformity and risk, whose product is a statistical predictor of changes to be avoided or managed. GIS is a machine for ensuring that the future looks as much like the present as the embrace of human and technology can devise. In a sense, the residue of cartography is only a metaphor for two entirely characteristic operations: the arithmeticization of knowledge, and its spatialization. All possible futures lie spread out as so many Feynman diagrams or forking paths, each of them open to the managerial rule of bio-politics.

The grid – of spreadsheet and database cells and stacks, of map coordinates, of calendrical dates – is the characteristic diagram, as Deleuze would have it, of digital media today. The array of the raster display and of CMOS and CCD cameras, LED, LCD and plasma screens, DLP and LCOS projectors; the matrix principle in storage, the grid of qwerty and calculator keys, the square waves that carry data through fiber-optic systems, all in Peter Lunenfeld's nice pun, snap to grid.

At the heart of the grid is the triumph of space over time, or rather the spatialization of time. Time is a mysterious thing: Augustine observed in the 5th century that as long as no-one asked him to define it, he knew perfectly well what time was, but if they did, he didn't. Once upon a time, time was on the human side of the population-environment equation. Very gradually, time migrated to the environmental side: something that stands over against us, in the way our tools became factories that dominated and constrained our actions. To use a now rather old-fashioned term, our tools were alienated from us; and now time has been alienated too. Alienation has an important legal meaning: something is alienable if it can be sold, given away or otherwise gotten rid of. Slavery is illegal because a human life is not alienable. To say that time has been alienated then can be construed as meaning, time (like factories, and now like information) can be sold.

When we speak of political economy, we mean the inextricable involvement of economics and politics. The pseudo-science of economics, once abstracted from politics, has resolutely failed every test (see Mosco 2009); at the same time, politics without economics has no traction as explanatory system. Most of all, neither has any actuality unless it is grounded, as we have seen, in material mediations. The alienation of time, its placing over on the side of the environment, makes it necessary, as Foucault suggests, that the political economy should mediate alien time back to the population. The instruments through which it does this are the media technologies whose history we just sketched: spreadsheets, databases and geographical information systems. So, what exactly happens to time in the media technologies of the neo-liberal database economy?

Our first observation is anatomical: time shares the arithmetic properties outlined above. Time occurs in unit steps that comprise the counting numbers. Take the basic process of digital imaging. The lens is opened for a fixed duration, during which photons flood in. Where they strike the pixel array of

receptors, the photons cause reactions which release electrons. The electrons en masse are what we call charge. To get them off the chip, ready for the next image to be taken, they have to be drained into some sort of storage. The design of the chip ensures that the charge will always flow in channels in a specific direction: let's say these are the columns of the future image. The problem then is the rows; and the solution is to have the charge from each pixel 'row' cascade down the column in strict lockstep: first the pixels from row one, then row two, and so on. This requires a clock function. Incidentally, writers complaining of the 'death of cinema' have missed this difference between analog and digital images, concentrating instead on a rather bogus argument about realism. The real distinction between the two is that analog images only succeed one another in time, where digital images contain time in the structure of each and every frame.

The time they contain was of course worked out, *grosso modo*, in the succession of cinema frames; and in greater detail by the scanning function of interlaced TV and analog video. But the soft blur of the old cathode ray tube gave away an ontological secret which cinema's photographic basis had hidden. No electronic image is ever complete. Even the startlingly fast refresh rates of progressively-scanned high-definition screens cannot disguise the fading of each image before the successor scan begins. It is this fading which drives television towards 24/7 broadcasting: there is no point in time when broadcasting can come to an end, not, that is, in the sense of 'the sense of an ending' that Frank Kermode identified as a crucial structuring and humane aspect of story-telling. The indefinitely extended future of simulation, the pseudo-virtual science of risk avoidance, allows no such satisfactions. (It is pseudo-virtual in the sense that pseudo-virtuality plots the knowable outcomes of known trends: the real virtual is the open becoming of unknown futures – as I'll explore in my conclusion.)

The endlessness of transmission is a quality of the pixel as the automated aggregate atom of perception, the flicker that enchants the eye, the essence of distraction which has exercised commentators on modernity from Benjamin and Kracauer to Jonathan Crary. Historically, the function of editing was to structure the flux by interrupting it, shaping space in continuity cutting, but also structuring the experience of flux into discernible scenes that succeed one another. Distracted gazing at flux is like watching the waves: the cut, which separates figure from ground and one scene from another, is a mimesis of the concentrated gaze that selects the telling detail and constructs a story – a temporal direction – from the manifold of perception. That process of in-forming flux is now undertaken at a far smaller scale. Though tiny, the pixels of a camera or projector chip are finite in dimension. The duration of exposure is also tiny but finite. But where pixels are atoms, photons are quanta, and the individual pixel in an individual exposure are aggregates of all the photons raining on them: their wavelengths as well as their numbers. The result is an average, reduced to the counting units of hexadecimal numbering. The ordering of time thus occurs not at the level of the frame now, but of the pixel. In addition, most codecs use a form of prediction to reduce redundancy in the signals they transmit. When a block of four pixels, a group of four blocks, or a less regular slice, is made up of pixels of more-or-less the same color, the codec reduces them all to one numeric code. If they stay more-or-less in the same place for the duration between keyframes, the data transmitted instructs the display to maintain that color throughout. Nothing emerges, nothing evolves or changes, in that duration. The ideology of

efficiency, now embedded in the very media through which, increasingly, we learn about the world, reduces change to its minimum. Four principles are in play:

the statistical averaging of captured light to a single figure;

the use of unit counting;

the clock function as a way of regulating the spatial configuration of the pixels;

and the predictive tools that minimize change over time.

The digital image respects space, but time is diminished.

Yet time is by no means redundant in digital systems. The basic device of packet-switching, foundational in the TCP/IP suite and increasingly to digital terrestrial and satellite broadcasting, is tied to time. The basic idea is simple: every message, whether an SMS message or a multimedia file, is split into smaller packets that find their way through the network to be reassembled at their destination. The problem is this: messages sent into the network have to have a limited lifetime, or the millions of undelivered fragments – the 404 errors, the 'unrecognized recipient' responses – would circulate forever, clogging up the vast but again finite resources of the Internet. Packets are therefore designed to contain not just data but a complex 'envelope,' which includes key data for its transmission. In addition to a sender and receiver address, each packet contains information on its position in the whole message: how many packets there are, and which one is included in the present item. Finally, the packet contains a kind of clock, listing the number of nodes it can pass through on its way to its destination. As it passes through each node, that number is reduced by one, until, if it fails to arrive, the number reaches zero and the packet is erased. This is what network engineers call the time-to-live or TTL of a packet.

I scarcely need to tell a room filled with artists and analysts of the media arts of the rich field of metaphors that can be evolved from this nomenclature. However, in obedience to my theme of the temporalities of digital media, I'll emphasize one in particular. Digital media are intrinsically ephemeral. As we have learned at various Media Art History conferences, through the flowering of archive research projects, and from important experiments like Jon Ippolito's Variable Media Network, digital media are even more prone to decay and loss than their predecessors. One facet of this ephemerality coincides with the management of time – time-management, risk management – that we have been discussing: the tendency for digital media technologies to live in an indeterminate and unending present, whose visual isomorph is the flux of pixel space.

There are then three large-scale activities going on in the digitization of time. Firstly, as countable units alienated from the human population and placed over against us as our habitat, time becomes commodity. Secondly, through the controlling mechanisms of both GIS simulations and predictive codecs, time becomes a medium of power, specifically of bio-political power. Thirdly, what both these economic and political analyses share is an aesthetic of spatialization and the endless present. To

reiterate, the aesthetic is not the icing on the cake: it is the recipe that makes the cake possible, the oven it is baked in, the chef that creates it. Political economy is conducted through these media; the forms of these media shape and are shaped by the political economy they mediate. Therefore, the electronic arts we celebrate at ISEA are by no means marginal, but the key material resources from which any new political economy will have to be articulated.

I take one last example. One of the interesting genealogies is that of projection, as ancient as the caves, as new as liquid crystal on silicon chips. Common to the mechanical projectors that launched in the 19th century are the combination of parabolic mirrors and condenser lenses used to force the light from a lamp through a tiny aperture onto a vast screen meters distant. Making light coherent would reach one apogee in the pillars of searchlights at Albert Speer's Zeppelin Field at Nuremberg; and though I don't want to make the strong statement, that coherent light is fascist, the organization of light Speer achieved should be recognized as emblematic of a certain kind of modernism, still borne in the Fox Searchlight logo.

Parallel with the development of cine-projection, late 19th century experimenters started working with the phenomenon of total internal reflection in water and glass. Two new features came onstream in the 20th century. One was laser, light with carefully construed coherence capable of traveling great distances and carrying information. The other was glass-fiber technology. The combination of light, coherence and glass in fiber-optics is the direct descendant of the assemblage of technologies which give us projection. There is, however, a final step in this process. The waveforms carrying digital signals through fiber-optics, which form the backbone of all our digital networks, are of a peculiar kind, sharing their shape with more and more universally standardizing transmission protocols within as well as between devices. This is the 'square wave.'

The units of digital media are, as we know, ones and zeros. Equally, we're all aware that zero charge is all but unrealizable, and that 'zero' is a polite fiction for 'small.' In diagrams of square waves, we see equally that the transitions from one to zero and vice versa are not immediate and total, but graduated: another feature we leave out of our logic. Like the photons we express as hexadecimal numbers, digital media deal in approximations. The approximations fit our current commodity-based, managerialist form of political economy. As we all know, transmission does not differentiate between different content types, only between units (packets, pixels); neither in packet switching nor in routers. All that is important to the TCP/IP suite, and to the functioning of any digital device, is that data be ordered in units, and that the units can be handled as if coherent. Processing – such as compression-decompression algorithms and color management systems – and display – now almost universally raster – only complete the universalization of the unit grid as the core diagram of our age. Even the hypercube that provided the essential geometry of Baran's anti-hierarchical networking is a cube, that is, composed of sides of unit length.

So, there we have a certain map of the digital terrain. From the dominant applications and displays to the clock function, chip design, packet-switching, and the square-wave in fiber-optics, our media are dominated by unit counting, statistical averaging, and the form of the grid. These qualities conspire to reduce time to a function of space; most of all, they replace the emergent and unforeseeable future with the indefinite, calendrical extension of the present. They do so, I argue, in the interests of a very specific configuration of power and wealth, which we can describe as the database economy.

Of course, this analysis of the political-economic aesthetics of digital media is problematic. It is a critique, and critique does not in general lend itself to building new options. Perhaps more important, there is no sign here of work practices that change technologies in subtle or radical ways: the work of the Peer-to-Peer Foundation and the gift economies of Linux, Wikipedia and so on; or the resilient, evocative, powerful and beautiful art that has been, and is being made, in this media. Technique, I mentioned in opening, is an engagement in media that goes way beyond the mastery that is all too often in subordination to the inbuilt norms of the toolset. In Marx's account, technology is the congealed form of the skills of generations of workers: we could, learning from indigenous wisdom, say that technology is where we in the west keep our ancestors. Indigenous people, when they pick up a tool, address the ancestors responsible for bringing it to the people. We however have forgotten the name of anyone but the proprietor of the technology, and in many instances not even that. Reconnecting with the living labor of the past in our contemporary technologies is one of the key actions of the digital arts. Inventing new techniques for using existing technologies is another: demonstrating their limits, working at and beyond them, creating new uses and retro-engineering what we are presented with, these are also digital arts.

We have little time to discuss the governance structures and commercial decision-making which have produced the current round of standardization. A case in point is the EMV chip, as used in chip-and-pin debit and credit cards. The letters EMV stand for Europay, Mastercard and VISA. EMV is a proprietary technology and perhaps the most significant interface between end-users and the global electronic flow of capital. In another field, the MPEG-LA Consortium control the vast majority of the patents involved in the MPEG-3 and MPEG-4 codecs. Lawyers working for the unholy combination of Microsoft and Apple assert that Ogg, and indeed any of the other open source codecs being propounded by Google and Mozilla for HTML5, infringe those patents, and that HTML5 – and implicitly IPv6 – should be tied to these proprietary formats. As even the Economist has argued in recent years, patents are becoming barriers to innovation instead of rewards. The miracle of the Internet – governed through the competing interests of over a dozen major panels and twenty or thirty minor ones – is that it works at all. But as many key organizations, among them the International Telecommunications Union, the International Standardization Office and even the IEEE, open themselves to deeper and deeper influence from transnational corporations; pressure mounts to slow the pace of genuine innovation, standardize devices and procedures, and concentrate on global market penetration.

The problem is that, from the psychology of perception used to test color responses to the design of cellnet coverage, good enough is always the cheapest option. Standardizing on the good-enough is

always the first option: think of the history of VHS tape. Only when the market is saturated and can consume no more does it make market logic to launch the next format. As long as we accept as necessary and unavoidable the constraints of digital media as given today, there will be no investment in getting hexadecimal computing, or quantum, or optical, or bio-computing out of the lab.

This does not mean that we should be waiting for the corporations to develop our media for us. My favorite example of the road not taken is Ivan Sutherland's Sketchpad. Remember, it's not so long ago that these things were being pioneered: Alvy Ray Smith told us a story at the Digital Light symposium in Melbourne about writing the code for HSV color space overnight, because he needed it in the morning. We should not be daunted by the existence of sophisticated binary machines, any more than Sutherland or Smith were daunted by the existence of sophisticated automotive engineering. Sutherland's pioneering graphics machine used a light-pen and a vector screen: an oscilloscope. Vector displays don't scan: the gun only points to the part of the screen to be activated: a bit like a plotter printer, it makes gestures.

There are two things about a vector that make it an oddity in the arithmetic domain we've just charted. Firstly, vectors do not work on the counting numbers but infinitesimals. A vector can be scaled up and down forever without producing the tell-tale 'jaggies' of bitmap imaging because it is not composed of the numerical addresses of pixel cells on the grid. A vector is a line expressing an algorithm, one that can be recalculated on the fly, which has a direction: the line A to B is not the same as the line B to A. A vector moves in time: that is why it is a sound metaphor to describe it as a gesture. Because it is recalculable, like a gesture, it can change direction, constantly or inconstantly as it moves into the future. Vectors thus include time, and reject the grid.

Ironically, they can only be displayed on raster screens, because in almost every domain, since the abandonment of vector screens in favor of CRTs in the games industry during the 1980s, raster displays dominate everywhere except in a few fields of science and engineering. However, the history of raster displays gives us a possible example of how abandoned technologies can be revived. In the 1970s, research of plasma screens had reached a dead-end, and though IBM and others kept plasma labs open, the technology was pretty much mothballed. But in 2002, its originators took home an Emmy, and Fujitsu were in full production. Now, there are serious reasons for not wanting to boost plasma screens, not least general ignorance on how to recycle them, but the principle of revisiting residual technologies is one we can bear in mind in the case of vector screens.

Those of us who grew up in Marxism, or indeed in many other Western and Islamic traditions stretching back to Ibn Khaldoun, know to expect, at the high point of a civilization, the seeds of its decay and replacement by another. The job at hand is to investigate which emergent principle or principles stand opposed to the hegemony of the grid and its spatialization of everything. This is the actual state of affairs, where by 'actual' we should understand the result of all previous actions. What we are looking for is then the 'virtual' of that actual, the vast array of possibilities which arise at the present, the only

moment in which an action can occur. Alain Badiou in his *Numbers and Numbering*, and Laura Marks in her wonderful book on the Islamic origins of digital art, *Enfoldment and Infinity*, give convincing mathematical arguments why the units or counting numbers are unstable; concealing the fact that they derive from the anti-Aristotelean principle of non-identity. Posing as coherent and unified wholes, digital media persuade us not only that the present extends indefinitely, but that no action is possible in the wholly actualized digital domain. As Benjamin might have said, the vector smashes this glass prison open with the force of its algorithms. The planned, regimented extension of the actual into indefinite sameness dreamed of by Stalinists and corporate risk managers alike crumbles on its own internal dialectic. This is the satirical strategy of Benjamin Edwards's 'digital paintings,' roundly attacked by Whitney Davis in *October* (117). Edwards works by gathering images and logos from the streets of the USA, rendering them into 2D and 3D objects for manipulation and composition, and in many instances then reproducing the results as acrylic and mixed-media paintings. For Davis, the satire falls flat, "Ah, the wit of the digital", he says ironically, "of digital analogy to the digital!" Davis recognizes in passing "Edwards's point seems to be that in the digitally constructed world of office parks and shopping malls nothing does exist between the digital units," but sadly he dismisses the point. Edwards is entirely impressive in his analysis of the artifice of coherence, and in the *Shockwave* sequence documenting the construction of the 2008 painting *The Triumph of Democracy*, painted in response to the financial crisis, the ghostly incompleteness of a planned landscape could not be clearer. If there is a criticism to make, it is that the work deploys vector graphics only to caricature the depthless spatiality of bitmaps. That leaves unaddressed the affordances of the vector to produce difference: the mathematics of emergence.

The vector is not an exclusively digital mode. They are traceable in Hogarth's line of beauty, in Klee's admonition 'to talk a line for a walk,' and in one of the most emotionally and intellectually satisfying works to date in vector graphics, Chris Brandreth's *Ryan*, the genealogy of vector graphics in the playful, imaginative, ever-evolving animations of its subject *Ryan Larkin* is entirely explicit. What appears in all these examples, as in the pioneer animations of Emile Cohl, and in popular culture in some of the best work of Pixar, is the room they create for futures of which we can only say that they are not the same as the present.

On those rare occasions when it is still possible to act outside of the planned accommodations of biopolitics – which already has in place strategies to manage the one per cent who walk up the down escalator – we make actual the virtuality, the potential stored in the existing state of affairs. That is the aesthetic of the vector: openness to unregulated, and indeed risky futures. Where time to live is measured in the dull ticking down of the square-wave clock function in packet-switching, the vector veers out of the plane of the grid – I want to say, at an angle I . (As mathematicians in the room will recognize, the complex numbers derived from I , the square root of minus one, can be represented as vectors on the complex plane whose axes are real and imaginary. Science, engineering and computer science make great use of these formulations. It is only the public expression of the digital, which is so profoundly wedded to the grid of rule and wealth-extraction). The most modest enquiry into the living conditions of the vast majority of the world's inhabitants will demonstrate that the existing regime has failed, and fails hourly, to ameliorate poverty, hunger, pestilence and the destruction of human and

non-human environments alike. The wealth it produces is sham celebrity and cheap tin trays. The power it exercises is pure anxiety, risk-averse to the point of inaction, or it is purely destructive of forces that do strain to change the world. To this extent, it is not power at all: power is potential, the capability to act, to risk, to make a decision, to change the future here and now in the only moment when it can be changed. This is the second great facet of the ephemerality of digital media: they occupy a moment not only of apolitical stasis, but of the inevitable fading away of the old, the inevitable instability, the inevitable moment when we will have no choice but to act. The existing time-to-live of digital media is actually a Heideggerian being-towards-death. The vector politics of the new media is about becoming; about living the present as action in order to create the future as new.

A search for 'vector art' will get you little more than clip art and tutorials, most of numbing, generic, unambitious, commercial ordinariness. Many animators, I know, will disagree in my assessment of Pixar, and find their work, and 3D vector animation in general dull. Of the great icons of vector mathematics, we ISEA-niks are thoroughly bored with the Mandelbrot set. In fact, it is worse than that. The central tool for controlling the steps between keyframes in MPEG and indeed almost all other codecs is vector prediction. Born free, the vector is already in chains. I make a plea, here, rather than a prophecy, and mark out a job of work. The vector aesthetic does not belong to the grid. It orients towards unforeseeable futures. It is the descriptor of action, of becoming virtual and making new actions possible, new actualities, from which further and further changes can emerge. I suppose I am trying to describe the mathematics, and the engineering principles, of hope. This is what the vector is for: creating the time to live.

THE IMAGE-OBJECT NOTION AND ART PRACTICES USING MOBILE SCREENS.

Dominique Cunin & Mayumi Okura

Whether it is a question of the object supporting the image or of the object represented by this image, the relationship between images/pictures and objects has evolved throughout art history. In this paper, we summarize three different approaches of the image-object notion in order to contribute to it and propose an extension of its field of application in artistic practices using mobile devices.



Fig 1. Book Tales — Petals, 2011, Dominique Cunin & Mayumi Okura, iPad interactive application, Copyright Dominique Cunin & Mayumi Okura



Fig 2. SensorGirl, 2010, Dominique Cunin & Mayumi Okura, iPad interactive application, Copyright Dominique Cunin & Mayumi Okura.

The image-object notion in visual arts

Every visual representation needs a physical medium so that it can be apprehended by its viewers. Since the very origins of visual arts and crafts, artists have been creating artistic objects by manipulating physical materials in various ways. Pictures can be seen because they are inscribed on or within a surface, even when this picture is made up of a very brief phenomenon. Bas-reliefs and sculptures produce images because they take a tangible shape that makes them visible. As a last example, cinema films can be seen by the audience thanks to the projection of its frames on a screen through a light beam. These statements, although obvious, show without ambiguity that an image is linked to the object it is shaped with (paper sheet, canvas, wood piece, etc.), whatever its plastic qualities or aesthetic objectives. Whether it is a question of the object supporting the image or of the object represented by this image, the relationship between images/pictures and objects has evolved throughout art history. Several analyses can be found in theoretical research about the relationship between images and objects. These analyses use the term 'image-object.' We summarize here three different approaches of the image-object notion in order to contribute to it and propose an extension of its field of application in the artistic practices using mobile devices.

IMAGE-OBJECT IN THE MIDDLE AGES

The first direction of research leading to the image-object notion is suggested by Walter Benjamin: "Artistic production begins with ceremonial objects destined to serve in a cult. One may assume that what mattered was their existence, not their being on view." [1] One thing that the author suggests here is that religious pictures and images should also be considered, in their physicality, as objects. This problematic idea has been developed by Jérôme Baschet [2] who sets out the notion of image-object as follows:

In the Middle Ages, there is no image that is not an object at the same time or at least, that is not attached to an object of which it constitutes the scenery and supports its use. [...] We suggest the notion of image-object, in order to highlight that an image can't be separated neither from the materiality of its medium, nor from its existence as an object, being acted and acting in specific locations and situations, and within the dynamic of social relationships and of connection with the supernatural. [3]

In the specific context of the occidental Middle Ages, an image-object would be "at once created as an image and an object" [4] and this notion "forbids to think it as the simple conjunction of an image and its medium. The image-object should rather be taken as an indissociable whole." [5] This first definition of the image-object, explicitly linked to the social and religious context of the European Middle Ages, is an image shaped by the means of physical material, a medium that gives it the capacity to exist as an object in a religious and social network of activities which determines their functionality.

MANET AND THE TABLEAU-OBJECT

In his analysis of Manet's painting, Michel Foucault [6] uses the notion of tableau-object. [7] If the term 'image' is not used here, this notion shows many similitudes with the image-object notion introduced by Jérôme Baschet and slides it into the context of the painting at the end of the 19th century, when it was more independent of religion. Here also, the medium's materiality of the picture is a major aspect but

with the idea that the painting is closely linked to its direct environment, and therefore its exhibition space.

What Manet has done is to make re-emerge, inside the painting's representation, the properties, the qualities or the material limitations of the canvas itself that the pictorial tradition had, in various ways, avoided or hidden until then. Manet re-invents, or maybe invents, the tableau-object, the painting as a materiality, as something colorful that is illuminated by an exterior light and in front of which the spectator turns around. [8]

Foucault's proposition consists in the demonstration of how Manet managed to restore the materiality of the painted artwork by considering, in the visual construction of his paintings, the physical characteristics of the canvas, the way it is shown and the position of the viewer facing it. Foucault seems to accentuate the sculptural aspect of Manet's paintings. As every volume placed in space, the painting becomes sensible to exterior contingencies, and becomes similar to an object that should be observed from various points of view. This idea is confirmed by Foucault's own words about *Un bar aux Folies-Bergère* (1882):

Here is the very last technic of Manet : the property of the painting to not be a normative space but a space in front of which we can move. The viewer is mobile facing a painting that exterior light strikes directly, verticals and horizontal lines are endlessly doubled, depth is erased. Manet didn't invent a non-representative painting but the painting-object in its material elements. [9]

IMAGE-OBJECT AND INTERACTIVITY

The term image-object is frequently used in the context of computer software. Many high-level programming languages use this term to name pictures that are included in a program. [10] More generally, object oriented programming (OOP), by its fundamental principals, naturally lead to the use of this vocabulary. OOP consists of the definition and the interaction of software bricks called objects. An object represents a concept, an idea or any entity whose structure and behavior have to be defined in a way that it can communicate with other objects. In this context, pictures/images becomes objects that can have a particular behavior. Beyond this technical approach, this image-object presents conceptual specificities that Jean-Louis Weissberg raised about interactive images. As it becomes an interactive object, an image can respond to our solicitations through physical interfaces (mouse, keyboard, etc.) because its specific behavior has been programmed. "The image becomes an existence mode for the object and an access to its creation, its transformation, its manipulation." [11] This relies on the digital nature of this image-object. Variable and programmable in time and space, the digital image-object takes place in a simulation, in a time that runs on because the spectator/user interacted with it, a "flatten time" [12] or "uchronic time" [13] that we usually call the 'real time.'

Here is constructed the reality effect of simulation, not in illusion nor substitution, but in intervention. At the end of this process are generate hybrids, intermediary beings, more figurative than images, more functional than objects. Let us accept to call these image-objects. They are not anymore a matter for representation but for presentation/simulation. [14]

Mobile screens: from image to object to image...

With the new generations of smartphones and tablet computers we assisted the gradual disappearance of the physical keyboard. For most of these devices, the main human interface is a multi-touch screen that makes the keyboards virtual, one of many other elements in a graphical user interface. The virtual keyboard of mobile devices is one hint, among others, of the radical compression of traditional human interface input/output devices into one single object: the screen itself. Mobile devices can then be thought as mobile screens. Our research into mobile screens and their use in artistic and interactive creations led us to another variation of the image-object notion. This variation does not exclude the three categories we stated above, but assembles them while concurrently extending the notion toward another meaning. *SensorGirl*, an experimental artwork we created in collaboration, [15] is a useful tool to illustrate this fourth image-object category.

SENSORGIRL: MOBILE SCREEN'S IMAGE-OBJECT MODEL

Accelerometer sensors, primarily made to measure the linear acceleration of the mobile it is mounted on, were popularized by the Nintendo *Wii* remote controller, some time before the gyroscope, made to measure angular position (orientation). These sensors, nowadays embedded in almost every mobile device available on the market can be used to compute the relative rotation of the device itself as it provides 6-axis motion sensing. In the daily use of, for example, an iPhone or iPad, the current orientation of the device returned by these sensors is used to automatically rotate the main user interface: if the device is physically turned in landscape orientation by the user, the GUI rotates in landscape mode and accordingly with portrait mode. *GLGravity*, an Apple iOS SDK sample code, [16] demonstrates to developers how to apply the rotation matrix from the sensors to a 3D teapot in real time. This technical demo shows how one can manipulate the mobile screen to see the 3D model from various angles: the model position looks like it is fixed in the actual space, and by rotating the iPhone physically around this virtual object one can see it from the top, the left, the bottom, and so on in real time. The demo is technically well done and shows a new type of gesture, specific to mobile screens and their potential, but it does not aim at any artistic ends.

SensorGirl attempts to give more significance to this special gesture. In this iPhone/iPad application, a 3D feminine figurine wearing a short white dress can be seen in a similar way to the teapot demo. The choice of a feminine figure dressed like this fits the idea of creating a strong analogy between the observation of this 3D model through the device manipulations and a real world situation: to see underneath the dress of an actual doll, one needs to either turn the object around or lower one's head in order to see what is hidden while looking from above. The manipulation of the device to discover what lies underneath is at the same time a pretext, a motivation and an invitation to manipulate the screen. In addition, by a subtle modification of the virtual camera's position according to the current model's rotation, the face of the 3D character can never be seen. Looking out for the face without success brings the spectator naturally to manipulate the screen in every possible angle. In the end, everybody ends up in a near-voyeuristic activity: holding the screen above their head, looking at the underwear of a 3D doll.

In *SensorGirl*, the physical state of the screen has a direct influence on the represented 3D object. It is by grabbing the device and turning it around that one can interact with the representation. What is discovered by this manipulation can make one laugh, amused, feel uncomfortable, or even offended. [17] In any case, the screen manipulation happens and leads to a result. The gesture of rotating the screen is

directly transmitted to the simulated object without the help of any third party interface device. The displaying medium and the interface device are not linked, they are the very same object. Mobile screen image-objects obviously inherits the property of the interactive images presented by Jean-Louis Weissberg: the capacity to be manipulated through their own visualization medium, a mobile screen equipped with embedded sensors. This image-object manipulation, therefore, depends on the material and technical properties of this medium (size, weight, sensor type and precision, etc.), which reminds us of the tableau-object Foucault analyzes in Manet's paintings. Finally, mobile screens are deeply inscribed in our contemporary societies, founded on information exchanges through communication networks. In a similar way to the image-objects of the Middle Ages, they are actively engaged in the social fabric and practices of a particular era. Mobile screens are the place where the three image-object notions we discussed earlier are working together as one notion, with one extension demonstrated by *SensorGirl*: the screen object itself and the image-object melts together to become one single entity.

A POSSIBLE INTERACTIVE GRAMMAR?

The gesture involved in *SensorGirl* is adapted to the interactive visualization of a 3D model in real time and reveals a new image-object model. However, other kinds of relationships with interactive images, in other words other interactive forms, are also a matter of the image-object. Following the path of non-mobile computer image-objects, that developed several well-known interaction gestures (drag and drop, point and click, etc.), mobile screen images-objects can produce various interactive 'figures.' Touch based, and some accelerometer based, interactions have been integrated in mobile device operating systems (iOS, Android OS, etc.) since their initial design, but many other 'image-object oriented' interactivity possibilities lie in these devices and can be used to create interactive artworks designed specifically for these devices. *Book Tales* [18] is a series of iPad projects based on a simple protocol: every application is an interactive scene using photographs of a book and explores one or more image-object oriented interactivities that mobile screens offer. Every application/book has its own title. *Les bonbons*, for example, consists of a blurred photograph of an opened book with candies placed on it. By touching the screen, the spectator adjusts the focus only around his fingertips to discover that he can read some words only through the candies, other parts being too blurry to be read. Another book, *Temps perdu*, shows the picture of an opened white book with a child's marble placed on it. Only inside the projected shadow of the marble does the book text appear and the spectator has to physically tilt over the screen to make the marble roll in the direction of gravity in order to read the text: an impossible and non-functional reading system. Another, *Petals*, shows an opened book with cherry flower petals spread out on it. Blowing on the device's microphone blows the virtual petals, which twirl and move from their starting position to reveal a blank area on the book page: the text's ink has been absorbed by the petals and is reversed as in a mirror. Other multitouch, gyroscope and accelerometer based gestures are used in other applications of this ongoing series, which can be considered as an artistic application series and a mobile screen based image-object interactivity catalog. This work is part of a larger research project into artistic practices using mobile screens and makes use of a specific programming language we developed called *Mobilizing*. [19] This tool, currently available on iOS devices, has been conceived with the idea to help artists to prototype and create art works for mobiles screens by providing a simplified programming tool. Partially inspired by *Processing*, [20] *Mobilizing* is an ideal tool to create small prototypes of image-object artistic projects and has already been used in various workshops. The result of this research may eventually be the construction of a kind of manual for mobile screen image-objects that makes the inventory of interactive figures available on mobile devices, a kind of interactive grammar particular to these devices.

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2. Jérôme Baschet, "L'image-objet," in *L'iconographie médiévale* (Paris: Gallimard, 2008), 25–64.
3. *Ibid.*, 33–34.
4. *Ibid.*, 38.
5. *Ibid.*
6. Michel Foucault, *La Peinture de Manet* (lecture in Tunis, 20 May 1971), <http://foucault.info/documents/manet/> (accessed September 2011).
7. *Tableau* is the French word used for painting, but it also bears the meaning of picture, canvas and board, which is why we choose to keep the French word in this notion.
8. Michel Foucault, *La Peinture de Manet*.
9. *Ibid.*
10. *Image-object* shows up on many websites about HTML and JavaScript, among others.
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DIGITAL PERCEPTION, TIME AND MEMORY: TOWARDS A NEW MODEL OF NARRATION IN DANCE

Andrea Davidson

Current debates on telepresence and telematic performance most often center on questions of immediacy, presence and virtual representation. Referring to Bergson's concept of time as duration, involving 'recollection memory' directed towards the past, and 'habit memory' oriented towards the future, this paper analyzes an interactive telematic dance performance that interrogates Bergson's theory and its link to the perception of time and space.



Fig. 1. Inter_views, 2009, Performance at the H2PTM Festival: Retrospective et perspective 1989-2009, Paris, and the University of Chichester, 2009, Dancers: Nanette Kincaid, Tamar Daly & Chris Jannides, Video image, Copyright Andrea Davidson & Jem Kelly



Fig. 2. Inter_views, 2009, Performance at the H2PTM Festival: Retrospective et perspective 1989-2009, Paris, and the University of Chichester, 2009, Dancers: Nanette Kincaid & Tamar Daly, Video image, Copyright Andrea Davidson & Jem Kelly.



Fig. 3. *Inter_views*, 2009, Performance at the H2PTM Festival: *Retrospective et perspective 1989-2009*, Paris, and the University of Chichester, 2009, Dancers: Nanette Kincaid, Tamar Daly & Chris Jannides, Video image, Copyright Andrea Davidson & Jem Kelly.

The project

The interactive telematic dance project *Inter_views* (2009), developed at the University of Chichester with Jem Kelly in collaboration with dancers Nanette Kincaid, Tamar Daly and Chris Jannides, connects remotely located spaces via a Skype audio link and a QuickTime Broadcast video link. In its first version, the work was programmed at the *H2PTM Festival: Retrospective et Perspective 1989-2009*, Paris, linking the dancers in performance at the University of Chichester to an audience at the *H2PTM* festival. Spectators in Paris were invited to choose phrases displayed on a computer screen and speak them into a microphone. Conceived in a second-person reflexive mode of address, for example, “You go to the window, you touch your hair, you think about your day,” the phrases were communicated as instructions to the dancers in Chichester who responded by drawing upon semi-improvised choreographic structures to build a ‘real-time’ choreography. Their movement was captured by video and re-transmitted to both locations in the form of large-scale projections that encompassed the proscenium arch and accumulating sequences of the choreography in the background forming a *mise en abyme* of the stage action. Though the audio transmission was instantaneous, a fifteen-second delay in the video transmission, occurring as a result of network fluctuations with the broadcast interface, was to create the possibility of a new narrative ‘space’ through which we sought to challenge the common notion that perception is immediate.

Contrary to mediated performances that use technologies as means to enhance, augment or extend the physical presence and dynamics of the dancing body, mediation here, while involving experimentation that renews the way spectators look at dance in performance, remained relatively discreet by comparison to works that involve multiple or split-screen projections, 3D motion capture, animation, or site-re-

sponsive technologies. Movement elaborated in rehearsal was performed unadulterated, and we neither sought to manipulate the body digitally, nor to produce overtly aesthetic effects. The idea was rather to map out a memory space in which the dancers and interacting 'spectator-instructors' could participate in a collaborative intentionality: one that is structured at the intersection of temporal immediacy and delay. A set of seemingly banal instructions was to give rise to a rich palimpsest of moments of an unfolding choreographic narrative; a form of re-embodied memory that is simultaneously reactive and interpretative.

The visual device

One of the main criticisms of dance performances employing new technologies is a potential tension, even competition, between the presence of live bodies onstage and their mediated representations, whose nature and scale often monopolize viewers' attention to the detriment of live action. Unlike theatre productions in which screens, monitors and their content have been incorporated as dramaturgical elements, screens in dance, when present, most often serve as décors or mirrors of choreography onstage. Furthermore, in establishing a reference to the cinematic model, they also tend to be read as such. By contrast, the staging of *Inter_views* entailed a different logic with the conception of stage space as a composite visual device designed to induce a particular visuality or way of viewing dance. *Inter_views'* device operates along principles deriving from the visual arts and photography though it will be shown how it finds its specificity in proposing a new temporal form.

The framing and isolation of movement

In *The Logic of Sensation*, Deleuze analyzes what he notes as a procedure in Francis Bacon's paintings that consists of isolating a "Figure" by tracing and/or duplicating a ring(s), cube(s) or rail(s) around it that produce "a kind of progression, an exploration of the Figure within the place, or upon itself. It is an operative field." [1] The isolation of the Figure signifies that an act that has taken place; creates a sense of place and "defines a 'fact'": it becomes "an Image, an Icon." [2] Bacon's intention is "to avoid the figurative, illustrative, and narrative character the Figure would necessarily have if it were not isolated." [3] Postulating narration as a correlate of representation, Deleuze concludes, remarking that the isolation of the Figure is "the simplest means, necessary though not sufficient, to break with representation, to disrupt narration, to escape illustration, to liberate the Figure: to stick to the fact." [4]

Precedents for Bacon's visual system can be found in the history of Western painting. In Van Eyck's *Arnolfini Portrait* (1434), a round mirror is placed in the center of the painting above the joined hands of a couple in the foreground. Along with the receding oblique lines of a wall on the left and a bed on the right, a dynamic spatial triangle is set up that both draws the gaze into the represented space and isolates the figures in the foreground. Similarly, in *Las Meninas* (1656), a play of multiple types of frames, further highlighted by zones of light and darkness, creates a certain abstraction of elements that isolates the action of a portrait session while signifying Velasquez's own presence as painter.

To paraphrase Deleuze, *Inter_views'* projection device frames and isolates the dancers as "Figures" while emphasizing choreographic "facts" that have taken place and creating 'a sense of place.' Rather than proposing pre-recorded dance sequences or a mirroring of stage action, the device functions as a window or repository of images: frames-within-frames, each isolating different scenes of the choreography as "an exploration of the Figure within the place, or upon itself." Produced by the feedback loop generated when a camera is pointed at its projection space, the effect constitutes a visual mode that lies

somewhere between the figurative and the abstract, thus marking a distance from iconic and representational codes normally associated with video. Drawing the spectator's gaze into a vortex of successive planes that constitute memories of a choreography that continues to unfold, the device offers a new way of constructing narrative and meaning. If this visual mode is easily hypnotic, the spectator's gaze can be refreshed by effectuating the equivalent of 'zooming back' to encompass the stage action where space is of another visual texture and scale.

To compare the effect produced to Marey's chronophotography or to principles of collage/montage that integrate heterogeneous elements to generate "an original totality manifesting ruptures of sorts" [5] would be too simple. As Gregory Ulmer notes of photographic representation with respect to the real, the image "signifies itself and something else – it becomes a signifier remotivated within the system of a new frame." [6] Moreover, if as Benjamin argues, the association of figure and verticality in painting and by extension, performance, distinguishes the representational function of art, [7] the presentation of movement seen receding in both space and time rather accents depth-of-field over verticality, abstraction over pure representation. The device constructs a process, an object, a perspective.

The framing of perception and deconstruction of Euclidean spatiotemporality

The principle behind *Inter_views*' visual device bears resemblance to Florence Henri's photographic work *Autoportrait* (1928). The artist captures her own image seen in a mirror as she stares out towards the spectator. Any other trace of her physical presence or action as a photographer is absent. An astute staging of the photographic frame exactly duplicates the elongated form of the mirror while extending the lines of the table before which Henri is seated in the spectator's direction. A powerful bidirectional and dynamic spatial contiguity is established between the spectator and Henri as subject. More crucially, it situates the spectator at precisely the point from which the photograph was taken and thus highlights (the) photography as an act. According to Rosalind Krauss, the device displaces attention from content to the container, "towards what one could call the semiotic or emblematic nature of the frame [...] it is the capture of the photographic subject by framing." [8]

This said, far from producing a purely abstract form or precluding a sense of corporeal substance, the work's play of surface and volume "guarantees its density (*épaisseur*)." [9] The frame "intervenes in the content [...] through morphological consonance – what one could call visual alliteration": it is a device of "repetition and echo." [10] In much the same way, *Inter_views*' projection space can be described as a "visual alliteration" or device of "repetition and echo" within the larger frame of the stage. More importantly, the device reveals and stages how framing organizes perception or visibility.

Noting how cinema had "transformed" the spectator "into a perceptual apparatus" [11] Annika Blunck suggests that expanded cinema in its turn was to challenge perception through its dismissal of the single unified screen, resulting in spectators having to mentally assemble elements that are spatially and temporally displaced. [12] So too, in *Inter_views*, meaning is created from what is fragmented. The device makes a break with Euclidean spatiotemporality, producing, as in mediated postdramatic theatre, a deconstruction of the unified stage and the illusion of events occurring in a causal, linear flow. Through introducing multiple layers of content, a classical form of narration and its stability of meaning are disrupted.

Temporal multiplicity

This deconstruction of performance space is further accentuated by temporal multiplicity, interactivity and telepresence. In cinema, temporal variability is typically organized through editing and postproduction effects that operate a “*trucage*.” [13] In the visual arts, multiplicity primarily concerns spatiality: through compositional strategies such as collage, montage, variation of viewpoint, transparency, focal or other optical effects such as the use of mirrors. It would not be until the advent of time-based art, interactive art and mediated performance that diverse responses to the question of temporality would emerge. However, while destabilizing perception, it is rare that these arts reconstitute diegetic and extradiegetic action, or analogical and reiterative temporalities, within the single screen/frame simultaneously. Digital programs such as *Isadora*, *EyeCon* or *Max/MSP*, allow for temporal delay in real-time but only with specific and predetermined programming of object behavior and it is also worth noting that conceptors rarely address the question of temporality in space with respect to depth of field.

In Bergson’s theory of time, duration figures as its fundamental characteristic, inferring a prolongation of the past into the present and of the present into the future in coexisting temporalities. Poised on a continuum of ‘recollection memory’ – as in contemplation– and ‘habit memory’ – as in motor mechanisms, goals or tasks that actualize or prolong the past – the present and perception of the real are experienced in a contracted state of tension pointed towards the future. Perception however, is “never a mere contact of the mind with the object present; it is impregnated with memory – images which complete it as they interpret it.” [14] As Bergson explains:

Our actual existence [...] duplicates itself all along with a virtual existence, a mirror-image. Every moment of our life presents two aspects, it is actual and virtual, perception on the one side and memory on the other [...] for the present moment, always going forward, fleeting limit between the immediate past which is now no more and the immediate future which is not yet, would be a mere abstraction were it not the moving mirror which continually reflects perception as a memory. [15]

Though the actual and virtual aspects of time coexist, normally, the human mind neither consciously perceives nor assimilates time’s double nature. When confronted with *Inter_views*’ visual device, that very precisely articulates time as waves of distinct scenes evolving simultaneously, the dancers were at first perturbed. Executing a choreography within these parameters was not easy for several reasons. The dancers were firstly challenged with having to process and retain information relevant to past, present and future movement phrases while at the same time, remaining aware of their spatial coordinates and the dynamics of relationships evolving amongst themselves. The need for precise spatial positioning had come to the fore in rehearsal as a means of maintaining clarity amongst sequences that were to be viewed in multiple planes of the visual field. Furthermore, the dancers were not always able to verify their exact position in space with respect to what was transpiring in the projection space behind them. Lastly, they also had to take into account the unpredictable nature of changes in instructions coming from the spectators in Paris, requiring that they be able to alter the course of actions underway at any moment. True virtuosity was at play: the visual device demanded increased and multiple sensory perception and real training!

Narration and the perception of time

The conjunction of temporal immediacy and delay in *Inter_views* cannot simply be described as the juxtaposition of live events unfolding in present time with the mediated time of virtual images that are submitted to a time lag. Each image is seen evolving in its entirety and every configuration of the work's choreographic content makes an ongoing reference to the future. This is why, along with the semi-random and interactive nature of the work, surprising encounters between the dancers can occur as if they were communicating with each other over and through time. One example of this can be seen in Fig. 1 where the arm of the male dancer in the foreground frames a scene in which the two female dancers are seen embracing, while at the same time, a face-to-face relationship is set up with one of the women in another frame as if the two were in conversation. Meanwhile, the action underway onstage between the three dancers establishes new relationships that propel the story forward while also determining the course and outcome of events in the other images with their unexpected juxtapositions.

Deleuze's concept of the 'crystal-image' or pure image of time can also elucidate this form of diffracted temporal conjunction. The crystal-image's bi-faced actual and virtual nature contracts and short-circuits time, condensing the past, present and future. Situating depth-of-field as cinema's closest tool for approximating this pure nature of time, Deleuze remarks:

[...] depth of field creates a certain type of direct time-image that can be defined by memory, virtual regions of past, the aspects of each region. This would be less a function of reality than a function of remembering, of temporalization: not exactly a recollection but 'an invitation to recollect...' [16]

It has been noted that depth-of-field in *Inter_views* constructs a process, an object, a perspective – of space and time – through which the choreography is seen developing in a multi-temporal manner. The actual and the virtual images are viewed within a composite visual field but are understood as an ensemble. Perception of this field is immediate. However, one question remains. The work's (re)construction of time depends on the device's fifteen-second delay for its articulation. If this delay were to be removed, could one still say that perception is immediate? Further, in the light of Bergson's admonitions about the way the human mind perceives movement and reality by substituting "for the continuous the discontinuous, for mobility stability" [17] and contemporary digital culture's parceling of data as discreet, autonomous units, can one still say that perception is immediate? It is these questions that persist and that *Inter_views* ultimately interrogates.

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* Excerpts translated by the author.

WEAPONIZING PLAY

Hugh Davies

This paper looks at the history of overlap between games and warfare and discusses the ethics and implications of militarizing today's most popular entertainment format.

The relationship between military and gaming is not new. Long before the recent evolutions in digital technologies, there existed games that simulated war and attracted the eye of competitive gamers and soldiers alike. Numerous ancient vases depict the Trojan War heroes Ajax and Achilles hunched over a small table, playing the popular war game *Petteia*, both players gloriously attired in full battle armor. Some sources believe this image refers to a passage in a now lost epic poem in which the warriors become so immersed in the game, indeed "as fixated as a pair of slackers at an Xbox" that they forget to join the real battle now underway. [1]

There are many other examples. The ancient East Asian game of *Go* and its close cousin *Chess* are both visibly abstracted from warfare. The Prussian game *Kriegsspiel* was credited for training officers in the art of battle before they went on to defeat Napoleon. The reported success of this intricate map based game played no small part in the widespread use of topographical maps and game mechanics in planning and strategizing battles in Europe and the Pacific in the Second World War. Immersive battle experiences that were applicable in both war and play were also popular among men and boys alike in the early Twentieth Century. H.G. Wells published two books on the subject: *Floor Games* (1911) and *Little Wars* (1913), both offering children and adults extensive rules and strategies for war-gaming with miniatures. [2]

The invention of video games in the 1960s heralded a new era. These entertainment devices had evolved through the hacking of radar screens from the Second World War, but by the late 1970s, sophisticated computer games were being used as military training tools. Most notable was *Army Battlezone*, a game that instructed soldiers in the use of the then new Bradley Fighting Vehicle. Early 1980s cinema introduced the weaponization of play in the science fiction adventures; such as *War Games* (1983) and *The Last Starfighter* (1984). The future military role of game entertainment was also signaled by President Ronald Regan who delivered a speech at Walt Disney's EPCOT Centre in 1983 declaring: "I recently learned something quite interesting about video games. Many young people have developed incredible hand-eye coordination in playing these games. The Air Force believes these kids will be outstanding pilots should they fly our jets." [3] These words were recalled following 9/11 when it was reported that the pilots who flew the planes into the World Trade Center had planned and trained for the attacks using Microsoft Flight Simulator. [4]

A new precedent occurred in 2002 with *America's Army*, the freely downloadable, teen-pitched entertainment and training package. *America's Army* is not stand alone, it comes with a swag of teen-targeted merchandise – including comics, t-shirts, action figures and posters – extending the brand awareness of the US Military and forging new connections between the Armed Forces and the pool of gamers it sees as potential recruits. [5]

These connections included involvement in 'grassroots' *America's Army* tournaments held at gaming cafes, loft LAN Parties (where gamers rig their computers together to create a small local network), conventions, and other locales, where the Army might send a recruiter to hang out with the gamers, complete with an Army-logoed Hummer full of recruitment-related brochures and freebies in tow. [6]

The US Army has reported that through these new engagement tactics it has caught the interest of a whole new generation of potential soldiers, who it is simultaneously attracting and training through the *America's Army* game. News of the game's success has spread. Earlier in 2011, it was reported that the People's Liberation Army of China have teamed up with Wuxi Giant Interactive Group to create their own military video game which pits Chinese soldiers against their main opposition, the US Army. The proudly named *Glorious Mission* computer game training tool has affronted the American Military by adopting their own strategy of engaging potential soldiers through video gameplay. [7]

It is easy to understand, given this selective history, how the discussion about video games often becomes a discussion about war and violence, this paper, however, has deliberately focused on militarized games. Games themselves do not promote war, but offer play, an experience so intrinsic to nature that even animals participate in it. Both games, and play, are more universal and communicative than spoken language. Furthermore, the fact that entertainment experiences are co-opted for purposes other than entertainment is certainly not limited to games. Adapting of the functions of games for purposes other than the enjoyment of play has now become a popular field unto itself known as 'gamification.' The concept of gamification, of adding a gaming component to a non-traditional medium, thereby creating brand loyalty and encouraging consumer engagement by integrating products and concepts with player's lives in meaningful ways, has become a staple of the advertising world. [8]

There are significant criticisms of gamification. Some dismiss it as a buzzword that re-brands old ideas and practices towards a new corporate fad. Others condemn it for its over simplification of game mechanics and player motivations. While there are numerous complaints of the field, I claim that the significant conundrum of gamification is that its emphasis is not on fun, but on altering perceptions through fun. Whether gamified products and services (also referred to as funware) achieve this ambition is questionable, but the very ambition is concerning enough. What gamification purports to instill in the mind of the player is ideology. It offers emotion hacking or love bombing to potential customers/players of the highest bidder, and, as is often the case with games, we may find the highest bidder is the military. However, as has repeatedly happened before, the concerns about the weaponization of games have been raised only when military forces other than our own have adopted the strategy. Recent claims about Al Qaeda's gamification of Jihad have suddenly brought up questions that should have been raised long ago about the manipulative potential of gamification. Again, it is the reputation of games that suffers. [9]

Games have a strong history of involvement with war, but they have a stronger history of demonization. They are regularly accused of causing distraction, violence and inactivity, despite each of these states being contradictory of the other; furthermore, games are often, as in the ancient example first used in this paper, accused of all three simultaneously. While the well meaning attempts to develop Serious Games have tackled some of these criticisms, with numerous successes, the result of putting games to use also appears to be back firing. Perhaps if we cannot find appropriate ways to put games to work, it is best to leave them as entertainment.

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CINEMA OVER PHOTONIC NETWORKS

Jane De Almeida

The paper presents a reflection on how high definition 4K films are reorienting cinema towards science, invention and technology. It also describes and reflects on experiments with 4K moving images, transmission over photonic networks, and stereoscopic film in gigantic dimensions.

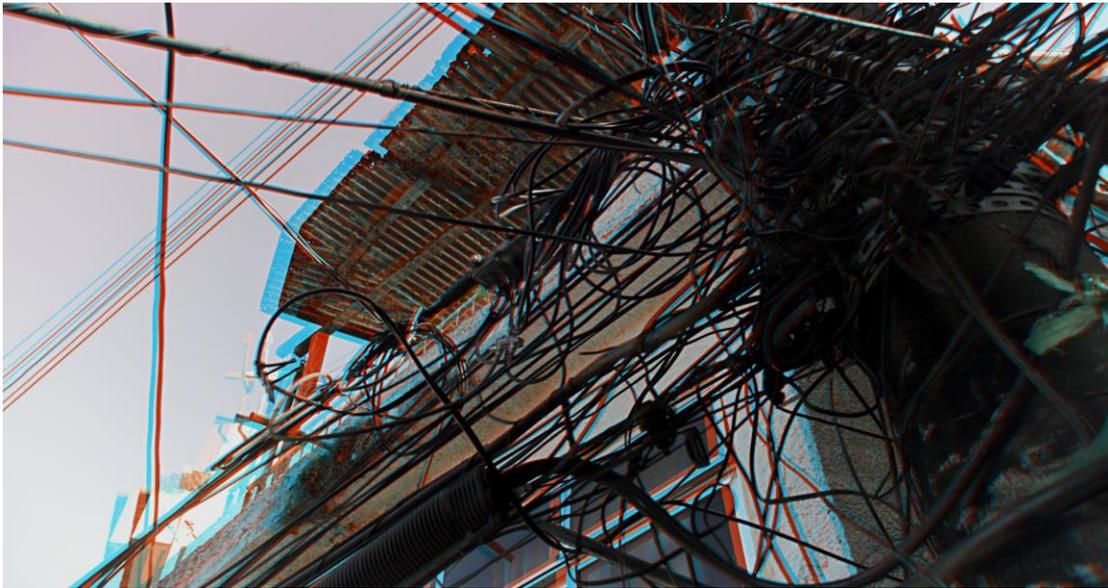


Fig 1. StereoEssays anaglyphic film still. Copyright Jane de Almeida.



Fig 2. StereoEssays anaglyphic film still. Copyright Jane de Almeida.

Digital Chaos inspired by Optical Chaos

Cinema, "the invention without a future" according to the Lumière brothers, marked the twentieth century in a profound and enriching manner. Much of what will be said in the future about the twentieth century will point to the wonder of the motion picture. In constant evolution, film production technology has undergone profound changes with the advent of computer technology; and today we are able to achieve and design images of unquestionable quality, with aesthetic results that astound even 'print' lovers.

Cinema pioneers were also considered inventors and scientists, as the 'filmmaker' profession did not exist. "Apporter au monde le monde" – to bring the world into the world, was the slogan of Lumière Brothers and Pathé-Film. As observed by German filmmaker Alexander Kluge, [1] the phrase has dual meaning: the birth of new images and of a new world, but also that the filmed world was being shown in Paris, considering Paris as the real world. Back then cameras were sent around the world to record far-off cultures, looking for "never-seen-before pictures." Today, the technological apparatus of super high definition images can be rendered visible on a micro and macro scale, from distant, never visited, places. After years of fictional narrative, scientists and inventors are once again seeking never-seen-before images, now to bring the universe to the world. Moreover, these images can be broadcast. It is no longer a matter of "bringing the world into the world," but of sharing the world through a two-ended device, with images to be seen and which also see.

When producing new technology, much care is required to present it. Despite what the Lumière brothers said about the future of cinema, the first images were carefully framed, using Impressionist paintings as references. When they decided to stage sketches, the Lumière family assembled their servants to perform a Cézanne painting, *The Card Players (Les Joueurs de Cartes)*, in motion. *The Arrival of a Train at a Station* is famous for the legend that it caused panic among viewers, startled by the real possibility of a train hitting them. Although this did not actually happen, the audience was really astonished and the Lumière brothers knew they would succeed by positioning the camera very close to the platform and waiting for the train's arrival. Besides home films and comedies, they explored figures in motion, such as the wall falling down and being 'rebuilt' in a reverse effect – *Démolition d'un mur* – or the blacksmith's smoke in *Le Forgeron*.

More than one hundred and ten years later, digital technology once again aspires to replace cinema, now with the power of projecting an image resolution of over 8 million pixels per frame. 4K resolution has recently been established as the standard image for digital cinema recommended by the DCI (Digital Cinema Initiatives), an association of the seven major Hollywood studios. 4K refers to the number of horizontal pixels, 4,096, which multiplied by 2,160 vertical pixels, gives 8,847,360 pixels in total. It is an image four times more precise than HD and 24 times more precise than traditional television, [2] but what scenes, what framing, and what kind of image is cinema unveiling? First and foremost, an incredibly sharp image, with vivid colors and details, intense brightness and impressive sheerness. An image in which one sees background details with the sharpness of a close-up shot. That trompe-l'oeil effect of the Lumières – or of Masaccio, in his paintings of the *Holy Trinity* at Santa Maria Novella, which produced the effect of a cave on a two-dimensional canvas in 1425 – can also be seen in the Japanese concert of the String Ensemble, broadcast live from Tokyo to San Diego in 2006. To enhance its reality effect, the concert was partially filmed with a row of seats framed in the lower part of the screen, strengthening the impression that it was performed right there, just a few rows ahead of the viewer.

In recent years, a new event has managed to further stretch the boundaries of cinema – considered here as large screen projection: transmission over photonic networks. Since iGrid 2002, the Cinegrid consortium has been designed as another event emerging from the LambdaGrid framework, the wavelength 'grid.' The 'lambda network' in a nutshell is the composite technology of fiber optic connections capable of transmitting light. Just like Glif, an international organization that promotes the paradigm of lambda networking and the research for developing an international fiber optic infrastructure, Cinegrid fosters an international and interdisciplinary community focused on very-high-quality digital media over photonic networks. At that instant, the cinema lights meet the photon light, combining to produce the transmission of a powerful image with hardly any loss of quality (or none at all).

Besides the network connections of the physical support, another requirement is a network of scientists, researchers and inventors seeking to accomplish the technological leap of the ubiquity dream. In other words, the characteristic property of television – transmission – is now within the reach of cinema. Cinegrid, however, in promoting this meeting between high quality image film producers, has also promoted a unique meeting that relates back to pre-cinema times. Since 2006, Cinegrid has been attended by photonic network engineers, film software developers, camera and projection equipment companies, computer scientists, new media scholars, film studios, sound studios for cinema, scientific visualization professionals, all sorts of artists and people interested in the matter. In fact, people's interests in Cinegrid are wide-ranging, involving various terminologies and idiosyncrasies. The films presented are short samples of pictures to demonstrate the equipment and the evolution of the transmission power and capacity. Except in rare cases, the films have no narrative, or even such intention. In fact, the most interesting are the views of museums, planetariums and other ways of seeing the world.

The whole community dreams of the moment when an observatory in a specific site will be capable of transmitting very high resolution images of its observations to other observatories around the world. Another interesting perspective for this community is the ability to view microscopic beings in very high definition, transforming them into characters of a unusual narrative, from a world known through the optical lens and old biology books and now in giant-sized living form, composed by digital language. This whole environment of the future reminds us of the great European technology exhibitions of the past, such as the *Exposition Universelles* in Paris or the *Great Exhibitions* in nineteenth century London, but without the same gigantic proportions and public. Several of the devices of the contemporary world had their precursors exhibited in those fairs. Many artists and filmmakers marveled at the viewing devices of the era, such as the Panoramas, the Mareoramas and Kaiserpanoramas. [3] The Lumière brothers presented in that edition of the exhibition the "Cinématographe Géant" with a 60x70 ft screen in a theater that could seat 15,000 people. All those experiments followed traditional cinema before it took shape as we know it: the dark room, projector, seats, screen at the front, a movie of roughly 90 minutes, the queue, the ticket.

The intention here is not to compare the great expositions to an event like Cinegrid in terms of proportions or public, but rather to highlight the hybrid environment where inventors, engineers, producers and artists gather to display and admire new technologies and the scope that each new device can achieve. Such an environment, however, is not exclusive to Cinegrid. It is a proper space for meetings, seminars and art fairs dazzled by the possibilities with technology driven by the advent of the computer. However, what is of particular interest in this event is precisely the axis that determines what 'cinema' is and its forthcoming configuration over the next 110 years. This configuration is the one that embanked all the inventive chaos of optical-cinematographic devices.

The photonic networks represent huge freedom for cinematic applications, as they enable a collaborative future for image distribution. These networks will enable on-line transmission of film festivals in real time, with premières all over the world. Some Cinegrid demonstrations show colormetric sessions being made, for example in the San Diego laboratory in conjunction with the Czech Republic (CESNET); [4] or sound editing sessions in San Diego, Los Angeles and Chicago happening at the same time without any acoustic quality loss. It is also known that these networks will reconfigure the telecommunications system, with a high quality image television and a far more flexible arrangement of a single point television, with the rigid transceiver structure. The end of network neutrality, a much discussed subject today, could lead cinema back to the studios to determine the end of a creative chaos of the cinematic arts.

Photonics Network Experiments

Inspired by the creative chaos of the time, we have produced some events in Brazil related to super-high definition cinema and its transmission. In 2008, during FILE (Electronic Language International Festival), fourteen short 4K movies were presented in Brazil for the first time for cultural purposes. For one week, more than 3,500 people attended the projections and the seminars about 4K technology and the future of the images using high-definition projection in cinema. FILE has unveiled highly advanced and bold pieces in terms of art, science and innovation in Brazil and abroad. For the 2008 edition, FILE was called FILE 2008 000 000 (Two thousand and eight million pixels), a pun for the eight million pixels per frame of the 4K image. Considering the success of the projection the next natural step seemed to be the streaming of 4K content using high-speed network infrastructure. This was proposed during the Cinegrid Workshop 2008 and the main challenges were the upgrade of the Brazilian network and its extension from Mackenzie University to FIESP where FILE takes place. Since the 4K film *Enquanto a Noite não Chega* (*While the Night Does not Come*), by Beto Souza and Renato Falcão, was about to be finished, it was decided that its première would take place in São Paulo, San Diego and Yokohama.

The project *FILE 4K Transcontinental* was an initiative taken and led by researchers of Mackenzie University and the Center for Research in Computing and the Arts –CRCA/UCSD (University of California, San Diego). After one year of research and production, in 2009 the results of the work developed by Mackenzie University and CRCA were presented at FILE. A theater with more than 600 people witnessed the première and the streaming at the FIESP Auditorium. The exhibition in Brazil was attended by film directors, as well as the presenters. In San Diego, the Calit2's division director at UCSD, Ramesh Rao hosted the exhibition and in Yokohama, the directors of the Research Institute for DMC at Keio University, Naohisa Ohta and Inakage Masahiko hosted the movie in Japan. The *FILE 4K Transcontinental* venue was considered by specialists in data transmission, such as Ramesh Rao, director of the CALIT2 at the UCSD, a benchmark in digital cinema research.

A new project led us to produce a promotional film with 4K/3D resolution in order to show the intentions of Project 2014K, which purports to broadcast live the games of the 2014 Soccer World Cup in Brazil, with 4K/3D resolution through photonic networks to ultra-definition movie theatres on all five continents. This is a collaborative and experimental hi-tech project involving research and technological innovation organizations as well as private enterprises. This promotional film led us to shoot the first soccer match with such resolution, which was shown at the 2010 World Cup in Johannesburg in the FIFA Pavillion named *Casa Brasil*.

Stereoscopic Gigantic Views

More recently, further experimentation has been performed as part of a research project developed by the Advanced Applications of Remote Visualization Working Group supported by the RNP (National Education and Research Network). This Working Group's proposal is the execution, production, organization and cataloguing of the creative process of audiovisual content in 4K/3D format. Thus, a test-film was produced with Red Epic cameras, capable of capturing 5K images, rigged to obtain stereoscopic images. The film, called *StereoEssays: Five or Six Stereoscopic Essays in Search of a Narrative*, was presented at Cinegrid@Rio. It is a high-tech audiovisual essay that explores ultra-definition images. As in the legendary *Views of the Guanabara Bay* (1898), considered the first Brazilian movie, made by the Segreto brothers, Rio de Janeiro is once again the focus of pioneering cameras. The difference now is that the 'views' can be observed in three dimensions and ultra-high definition.

Since the outset, the film project has tackled the technological challenges of the major research laboratories. From the single camera pair, a piece of equipment still unknown to experts, to the processing of images with roughly 10 million pixels, and screening the film with special projectors, still in the phase of stabilization. In the stereoscopic projection of the film (3D), the resolution reaches 20 million pixels per frame on the screen, counting the images corresponding to the left and right eyes.

This experiment recalls the challenges faced by the pioneers of cinema and retrieves the fantasy of the 19th century stereoscopic apparatus. In 1891, Edison already intended to bestow stereoscopic depth on the kinetograph images that would be seen through the kinetoscope. In 1856, only two years after being founded, the London Stereoscopic Company sold half a million stereoscopic viewers. In the pre-cinema age, stereoscopic photography provided a new experience of perceiving reality, giving viewers a new level of immersion into the images, as if traveling to remote places and personally partaking in far-off events.

In 1935, Louis Lumière remade *The Arrival of a Train at a Station* (*L'arrivée d'un train en gare de La Ciotat*, 1895) in a stereoscopic version, which was possibly the true motive for the famous amazement at the realism of the images usually attributed to the public projection of *L'arrivée d'un train* in 1896. Walter Benjamin [5] has reported on more than one occasion his stereoscopic experience with the Kaiserpanorama in Berlin in 1900. The German thinker mentions the public's fascination with travel photographs and uses the stereoscope as a metaphor of the new configuration of modernity, with images "arranged as if they had come out of drawers," [6] brightly colored scenes and objects against backdrops with towering buildings and forts, inherited from the Tsarist regime in the city of Riga. Later, Benjamin draws attention to the time required to give such detail to these new three-dimensional scenes, and suggests that the "stereoscopic look" should be cultivated in order to tackle deep down the "historical shadows." [7] All this "stereoscopic heritage" of still and moving images served as inspiration for the *StereoEnsaïos* project: scenes that take us back to the history of equipment that shows 'views,' the arbitrary movement of nature, machines and the human body, full of sensuality in light of the stereoscopic device.

The stereoscopic vision generated by new ultra-definition (5K) technologies urges us to consider new possibilities of image, new metaphors for cinema and a new level of sensations – in short, a whole new aesthesis. The gigantic, digital ultra-definition images set the stage for a new visual upscale.

Whereas before we had the 'cine eye' (in the singular), with Dziga Vertov and the centrality of the monocular perspective that accompanies his story, now the stereoscopic image allows perception of the visual world around us through a 'stereopsis.' It can be considered a shift from the Cyclops (single eye) movie camera to a dual camera, stereoscopic view. In this regard, how are we to contemplate a whole new world of moving images captured mechanically and electronically through a binocular perspective? In simpler and more direct terms, how are we to shoot and assemble a three-dimensional film, narratively speaking? What do our eyes, saturated by over 110 years of motion pictures, support –and expect – of the images revisited by stereoscopy in colossal proportions? Above all, the issue tackled by *StereoEssays* is: is 3D a language or an effect?

The questions are only just beginning.

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WHOSE ELECTRIC BRAIN?

MARYSE DE LA GIRODAY

Memristors are collapsing the boundaries between humans and machines and ushering in an age where humanistic discourse must reach beyond its conventional boundaries. The distinctions between life/nonlife, courtesy of the memristor which confers the ability of remember and learn on machines, are blurring into undecidability. This paper traces the scientific developments and speculates about the possibility of cognitive entanglement.

Introducing the memristor

We still don't know much about brains, our own or any other species' and yet work on artificial brains (or forms of consciousness) continues at a furious pace aided by discoveries such as the memristor, which offers tantalizing possibilities for scientists and engineers and speculative material for artists, philosophers, and writers.

A new circuit element in electrical engineering, the memristor, is a contraction of the words memory and resistor. In other words, it acts like a resistor (a standard circuit element along with the capacitor and the inductor) and it has memory.

"Think of the resistor as a pipe through which water flows. The water is electric charge. The resistor's obstruction of the flow of charge is comparable to the diameter of the pipe: the narrower the pipe, the greater the resistance. For the history of circuit design, resistors have had a fixed pipe diameter. But a memristor is a pipe that changes diameter with the amount and direction of water that flows through it. If water flows through the pipe in one direction, it expands (becoming less resistive). But send the water in the opposite direction and the pipe shrinks (becoming more resistive). Further, the memristor remembers its diameter when water last went through. Turn off the flow and the diameter of the pipe 'freezes' until the water is turned back on." (Williams, 2008, p. 2)

Up until the Spring of 2008 the memristor was an obscure, almost forgotten theory in electrical engineering. Posited by Dr. Leon Chua, professor of Electrical Engineering at the University of California, Berkeley, the presence of a memristor as a potential addition to the classic circuit elements (the resistor, the capacitor, and the inductor) was theorized in 1971. (Note: In fact, there was an earlier scientist, George Widrow who posited a very similar new circuit element that he termed the memristor. Chua came to his theory independently. [Moutet, 2010, p. 211])

A team led by R. Stanley Williams at the HP Laboratories in Palo Alto, CA, published a study in the May 2008 issue of the journal *Nature* describing how they proved the new circuit element's existence experimentally.

It might not have happened,

"... the hypothetical device was mostly written off as a mathematical dalliance. Thirty years later, HP senior fellow Stanley Williams and his group were working on molecular electronics when they started

to notice strange behavior in their devices. ‘They were doing really funky things, and we couldn't figure out what [was going on]’, Williams says. Then his HP collaborator Greg Snider rediscovered Chua's work from 1971. ‘He said, Hey guys, I don't know what we've got, but this is what we want, Williams remembers.’ Williams spent several years reading and rereading Chua's papers. ‘It was several years of scratching my head and thinking about it’. Then Williams realized their molecular devices were really memristors. ‘It just hit me between the eyes’.” (Adee, 2008)

In fact, ‘being hit between the eyes’ is a strange metaphor for Williams to use since memristors and other such phenomena at the nanoscale cannot be observed with the eye. The microscopes are haptic, i. e., the tip or probe is dragged across a surface during which time minute variations are recorded via software then the information assembled into an image on a computer screen that is viewable by scientists. Nonetheless, Williams has created visual representations of memristors such as this one.

A few months after Williams and his HP Labs team offered experimental proof of the memristor's, existence the team published research (in Nature again) with a description of achieving engineering control of the new circuit element both in its digital and analogue forms. In its digital form, the memristor would allow instant operation. For example, your computer or laptop or phone or other electronic device would start instantaneously as it would no longer need to reboot. In its analog form, the memristor could allow hardware to learn.

Undecidability and boundary collapse

The memristor's capacity to be either digital or analog calls to mind Jacques Derrida's notion of undecidability. This notion of undecidability does not lend itself to the memristor proper as it is a theory which explains a collection of anomalies in electrical engineering at the micro and nano scales and as such is not dependent on the binary system which makes undecidability possible for such constructs as zombies, for example.

“Between life and death – it's an uncertain space. The zombie might be EITHER alive OR dead. But it cuts across these categories; it is BOTH alive AND dead. Equally it is NEITHER alive NOR dead, since it cannot take on the ‘full’ senses of these terms. True life must preclude true death. The zombie short-circuits the usual logic of distinction. Having both states, it has neither. It belongs to a different order of things: in the terms of life and death, it cannot be decided.” (Collins & Mayblin, 2000, p. 19)

Where the notion of undecidability does lend itself, if not to the memristor proper, is to the proposed machinic functions made possible by the analogue/digital memristor.

It's by rendering possible that dual digital/analog space that the memristor can be described as an agent of undecidability since it performs a transformative function for machinery/hardware which until now was decidably nonlife. With the advent of the memristor, machinery/hardware, formerly unable to remember and learn, has the possibility of both, a trait that defines biological systems (life). The advent of the memristor as a new circuit element leads to the same questions one asks about zombies, is the machine alive or dead, or both, or neither? Unlike the zombie (life/nonlife) which hungers for brains thereby destroying that which is decidably life, the memristor (via the field of neuromorphic engineering) could lead to the creation of an artificial brain thereby making machinic life/nonlife possible.

Neuromorphic engineering is an interdisciplinary field,

“... whose goal is to design artificial neural systems with physical architectures similar to biological nervous systems. One of the key components of any neuromorphic effort is the design of artificial synapses. The human brain contains vastly more synapses than neurons – by a factor of about 10,000 – and therefore it is necessary to develop a nanoscale, low power, synapse-like device if scientists want to scale neuromorphic circuits towards the human brain level. ... ‘A memristor by definition is a resistive device with inherent memory. It is in fact very similar to a synapse – they are both two-terminal devices whose conductance can be modulated by external stimuli with the ability to store (memorize) the new information.’ [Dr. Wei Lu, assistant professor at the University of Michigan, Dept of Electrical Engineering and Computer Science].” (Berger, April 23, 2010)

This description of the memristor as being “... very similar to a synapse” followed by details that make the two seem identical is fascinating in light of Williams’ 2008 comments “‘We won’t claim that we’re going to build a brain, but we want something that will compute like a brain’, Williams says. They think they can abstract ‘the whole synapse idea’ to do essentially analog computation in an efficient manner.” (Adee, 2008) In two years, they went from ‘abstracting the whole synapse idea’ to acknowledging its similarity. While scientists drift closer to publicly acknowledging the memristor’s possibilities (and its position as a transformative agent conferring undecidability on that which was previously decidable), they do not appear willing to publicly commit to the notion.

The notion of undecidability allows us to view a collapse of boundaries that first occurred theoretically in quantum physics. That theoretical work is now being made manifest at the nanoscale and we can expect it to lead to the collapse of several boundaries at the macroscale that would once have been unthinkable. For an example of a boundary collapse at the nanoscale, until recently biologists and physicists would have told you that biological molecules do not follow the principles of quantum mechanics.

“Until now, says Prof. Ron Naaman of the Institute's Chemical Physics Department (Faculty of Chemistry), both biologists and physicists have considered quantum systems and biological molecules to be like apples and oranges. But research he conducted together with scientists in Germany, which appeared recently in *Science* ..., definitively shows that a biological molecule – DNA – can discern between quantum states known as spin.” (Nanowerk, March 2011)

The conclusion based on this research seems to have been prefigured by Alfred North Whitehead. A well known mathematician who wrote on philosophy, physics, logic, and more. He suggested some 80 years ago, “... there is no absolute gap between living and nonliving societies.” (Sherburne, 1981, p. 88) This also seems to prefigure Derrida’s undecidability and zombies as living and/or dead. (In Whitehead’s terminology, atoms and molecules are considered societies.)

Here’s another example of a nanoscale boundary collapse,

“Air and water meet over most of [the] Earth's surface, but exactly where one ends and the other begins turns out to be a surprisingly subtle question.

“A new study in *Nature* narrows the boundary to just one quarter of water molecules in the uppermost layer -- those that happen to have one hydrogen atom in water and the other vibrating freely above.” (Science Daily, June 19, 2011)

The boundary between water (liquid) and air (gas) collapses; is the molecule water or air, both or neither? It's too early to tell if this undecidability will have any consequences at the macroscale but this 'haptic' boundary collapse (water is touchable while air is not) echoes something which takes place amongst scientists working at the nanoscale.

Entanglements

Colin Milburn (2008) documents another kind of boundary collapse, one, between researchers and atoms/molecules, taking place at the tip of a scanning tunneling microscope (STM).

"The media ecology of the STM—nanoscale haptic image, machinic symbolic, and the real interchange of electronic particles tunneling across the quantum 'vacuum gap' or 'forbidden space' between the molecular world and the STM's tip, outside processed data—comes to instantiate, to materialize, the human subject's perceptual ratios differently, such that the encounter with the world is apprehended now not as a division of perception (for example, into visual or auditory ratios) but rather as quantum connectivity or entanglement, where 'real space' is touched across the symbolic translations of data ... (p. 90) data

Milburn's version of quantum entanglement could be called a manifestation of cognitive entanglement, while the memristor as an enabling agent could be described as facilitating yet another kind of cognitive entanglement.

At its heart, entanglement, whether it's quantum or cognitive, is about connectivity. In Milburn's stated case, the entanglement at the sensory and cognitive levels is such that it seems as if humans are in direct contact with a nano world, comprised of atoms and molecules.

"It's not, of course, that the operator is 'actually' touching individual atoms (however that would differ from our everyday encounter with gross matter), but rather that the medial translations and remediations of electronic convergence have produced sensations of connectivity at a radically different scale: tunneling all the way down, with no uncrossable or 'forbidden' gaps between our world and the world of the quantum." (Milburn, p. 91)

This nano world which can be touched is being extended beyond the research community and scientists to the general public in exhibitions like Nanooze at Walt Disney World's Epcot Center where visitors (mostly families) are encouraged to 'touch a molecule' as one of the exhibits is titled. In fact, visitors are touching an animation of a molecule. (de la Giroday, Sept. 6, 2011) This is an invitation to treat the nano world as if we have direct contact with it or, in this case, as if an animation of a molecule transforms, in the same way Milburn suggests that the STM has done for scientists, perceptual ratios so that the boundary between visual and haptic perceptions collapse and leave an interstitial space where cognitive entanglement occurs.

Milburn's following description of the impact that this shift creates for scientists can also be applied to the visitors at Walt Disney World's Nanooze exhibition,

"It is an affective moment, an unconscious, as-if-unmediated experience of direct 'connection' with molecularity. In the same way that new media work to make it seem that no mediation is involved in pre-

senting an immersive immediacy ... viewing the images produced by the STM while operating the machine makes it seem as if the human is in direct confrontation with the molecular nanoworld. ... Thus the real local properties of the nanoworld become interdigitated with the exploded fingertips of the posthuman colonist." pp.90/91

Or when you're at Walt Disney World, these are the exploded fingertips of a visitor, usually a child.

Where is this going?

The memristor as a transformative agent enables the possibility of an entanglement unthinkable even 30 years ago, a cognitive entanglement between life and nonlife. By enabling the creation of artificial synapses and, ultimately, artificial brains for machines that can learn and remember in a fashion similar to biological systems, the memristor facilitates another boundary collapse courtesy of research at the nanoscale. This collapse leads to undecidability with regard to the distinctions between life and nonlife. Combined with the boundary collapse (which we can expect will extend into the general population as STM's and other microscopes of that ilk become commonplace in educational institutions at all grade levels (and/or the proliferation of more exhibitions like Nanooze) which Milburn documents, the stage is set for a number of scenarios.

One of the first to occur comes from popular culture which has framed and dominated the public discussion there has been about life/nonlife. The popular culture discussions on life/nonlife are longstanding reaching back to 1818 at least and the publication of Mary Shelley's *Frankenstein*. More recent entertainments such as *True Blood*, a series of books and now US television programmes, feature vampires (the living dead) who want acceptance and 'human' rights from the living. Another example can be seen in the debates on the *Star Trek: The Next Generation* and *Star Trek: Voyager* US television programmes. Including such characters as an android, Data, and a holographic doctor, respectively, seem deliberate attempts to introduce discussions about life/nonlife and acceptance and human rights into the DNA of the series themselves. In contrast to *Star Trek* where nonlife (except for the Borg which outside the *Star Trek* universe is known as a cyborg, an entity integrating biological life with machinic life) strives to be accepted by humans, *Battlestar Galactica* (the new and old versions), which also introduced life/nonlife into the DNA of its stories, featured androids and robots determined to exterminate humankind.

All these discussions are for the most part binary. The two categories in recent entertainments are (1) they (e.g. machines/holographic constructs) are like us, i.e., life, or they (e.g. cyborg which are part machine and part biological organism) are not like us, i.e., nonlife. But Milburn's observation that scientists experience a direct experience of molecularly with a concomitant shift in perceptions and extension of connectivity across the gap which exists between the macro and nanoscale suggests the possibility that the binary model for this discussion will collapse in much the same way that the visual/haptic boundary collapses for both scientists working with STMs and visitors playing with an animation at the Nanooze exhibition.

As these boundaries collapse yet another chain of cognitive entanglement scenarios is made possible in the life/nonlife discussion. Technically, the memristor makes possible not just an artificial brain but the integration of artificially derived synapses with biologically derived synapses. For example, it can be expected that future patients (already experiencing a cognitive entanglement with the nano world) will want to have their brains repaired or possibly have their intelligence augmented with an artificial

synapse leading to a type of cognitive entanglement that is intimate. It is possible to envision a future where the distinctions between humans and machines will be difficult, if not impossible, to maintain.

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NAKED ON PLUTO

Marloes de Valk

Naked on Pluto is a multiplayer text adventure using Facebook to integrate a player's personal data as elements in a satirical, interactive fiction. The game questions how social media shapes our friendships and commodifies our social relations through targeted advertising based on information we supply. This paper presents the project, its context, and looks at how privacy and data harvesting can be critically examined using online gaming.

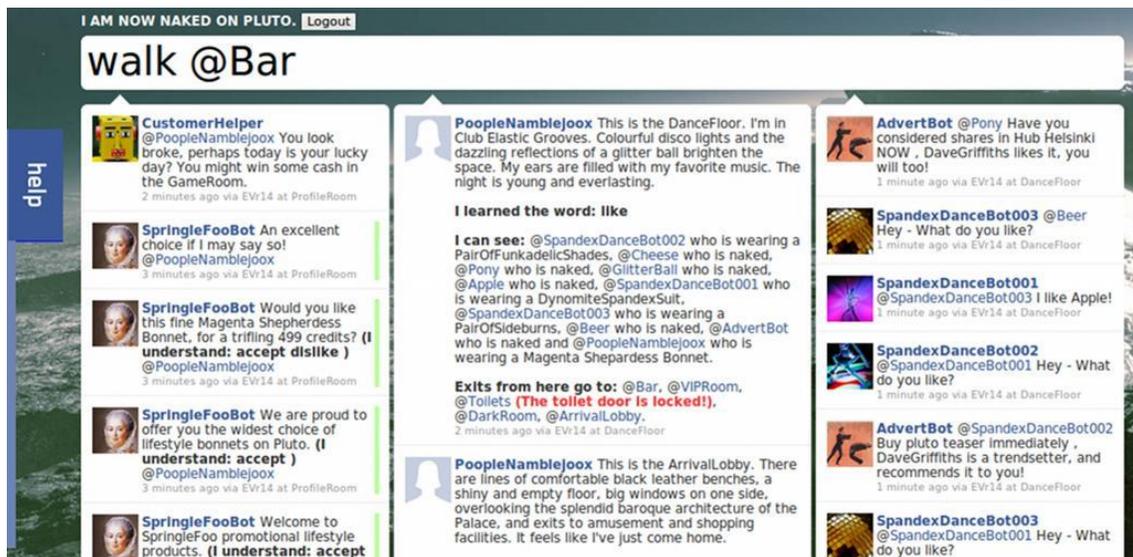


Fig. 1. *Naked on Pluto*, 2010, Dave Griffiths, Aymeric Mansoux and Marloes de Valk, screenshot, Free Art License



Fig. 2. *Naked on Pluto* stickers, 2010, Dave Griffiths, Aymeric Mansoux & Marloes de Valk, photo, Free Art License

Welcome to Elastic Versailles revision 14. You look fantastic today! Elastic Versailles is here for your convenience, tailored to your needs, offering you the best in entertainment the galaxy has to offer. Win coins in our illustrious casinos, spend coins in our luxurious and exclusive shopping facilities, play games with our friendly bots, socialize with old and new friends, and share your way to a better world! [1]

Naked on Pluto is a Facebook-based multiplayer text adventure, integrating players' personal data and that of their 'friends' as elements of a satirical and interactive work of fiction. The game calls into question the ways in which social media affect our friendships, and how social relationships have become a commodity for targeted advertising based on the huge quantities of information we voluntarily supply to social media databases – thereby literally exposing ourselves. The game was developed in 2010 as a response to the explosive growth of the market for personal data, and the role of social media in this growth. Inspired by the critical and political text-based games of the 1980s, *Naked on Pluto* combines a playful quest to escape the watchful eye of a corrupted artificial intelligence with serious research into the underlying issues of the current crisis in online privacy. This paper examines these issues, warns against the end of anonymous data, and presents the *Naked on Pluto* project.

We all share a great deal of information with others online. Not only voluntarily and consciously, through the public side of social media, but also unknowingly, through searching, purchasing and browsing. Furthermore, other areas of the web are endlessly being 'scraped' to complete the (already very detailed) profiles data brokers and profiling companies have on us. Most people are aware of the existence of the market for personal data, but how it functions, what the further implications are and what kind of legislation is in place to protect consumers – all of this is unclear to most of us.

To some, the trade-off between personal data and free, often customized, services paid for through advertisements seems more than fair. You get as much back as you give. Convenience comes at a price. The problem is that it has become almost impossible to make such trade-offs consciously, with a clear idea of what the consequences will be. Online, it is hard to tell when you are leaving a private space and entering a public one. A great deal of data is harvested without the knowledge of the consumer – not only through scraping and invisible trackers, but also through privacy settings that are intentionally difficult to manage and set by default to share everything. Furthermore, privacy policies are often incomprehensible to anyone but lawyers; and yet we can't stop sharing. Felix Stalder explains how new forms of sociability have arisen; how, in order to be social in the networked society, we first have to make ourselves visible. In this context, privacy is not a positive right, but a possible threat to be disconnected. [2] What is the value of privacy when we rely on visibility in order to socialize?

The 'I've got nothing to hide' argument, often proposed in the 'privacy versus security' debate, is not easily countered by a similar one-liner explaining the value of privacy. This is a more complex and abstract story. Whether we are being watched to catch terrorists or to sell products, the aim is always to analyze in order to control. As Bruce Schneier, security technologist and author, pointed out:

Too many wrongly characterize the debate as 'security versus privacy.' The real choice is liberty versus control. Tyranny, whether it arises under threat of foreign physical attack or under constant domestic authoritative scrutiny, is still tyranny. Liberty requires security without intrusion, security plus privacy. Widespread police surveillance is the very definition of a police state. And that's why we should champion privacy even when we have nothing to hide. [3]

Daniel Solove quotes the philosopher John Dewey, explaining how privacy as an individual right furthers the common good. It creates a space for people to breathe, by protecting against excessive intrusion (by states, companies, etc.) into our lives. [4] Privacy is social.

The so-called open Web plays an important role in the current crisis in online privacy. Celebrated for its transparency, interoperability and decentralized nature, the open Web is not just open and accessible for the benefit of all; it also happens to be extremely suitable for data harvesting, tracking, scraping, data mining, profiling and behavioral advertisement. This tendency is fuelled by (and in turn fuels) a booming industry. On the one hand, there is a genuine endeavor towards openness, motivated by a belief in the public good; on the other, there are forces driven by purely commercial goals. How to balance the two?

The free-market approach to the protection of privacy assumes self-regulation and consumer responsibility. But when there are no reasonable alternatives for consumers, when a company's privacy policies are unclear, when third parties invisible to the consumer are involved, it becomes impossible to make informed choices; thus governments must define and enforce standards of privacy.

Within the current framework of legislation, too much trust is placed in the mere 'stripping' of data directly identifying a person. With more and more open datasets available, it becomes increasingly easy to de-anonymize data using matching techniques. *Peekyoufor* for instance, a 'people search engine,' has applied for a patent detailing a method that matches people's real names to the pseudonyms they use on blogs, Twitter and other social networks. [5] A 2006 paper by Narayanan and Shmatikov, researching anonymity in databases, shows how vulnerable 'high-dimensional' data is to de-anonymization. [6]

Compared to the rapid growth of the market for personal data, legislation to protect users from invasion of privacy is lagging eons behind. Making an 'opt-out' or 'do-not-track' option mandatory (for browsers as well as tracking and profiling companies) would be a good start. However, even if the laws were brought up to speed, is it possible to properly enforce them? This would require a close inspection of the code of every single application and online service accessing a user's personal data.

Online games are increasingly popular, while game mechanics are applied extensively in an attempt to generate the same kind of eagerness to participate as experienced during gameplay. Globally, we spend 3 billion hours per week playing online games. [7] Jane McGonigal suggests using the positive emotions experienced by gamers for the benefit of all. In her talk during TED, in February 2010, she made a strong case for using the 'superpowers' of gamers to solve real-world problems, and to play games that matter.

Using games to address real-world issues is nothing new. For instance, *The Landlord's Game*, a precursor of the well-known *Monopoly*, was designed to demonstrate the economic principles of Georgism – in this case, how renting property enriches owners while impoverishing tenants. The idea of the game is to make the economic principles tangible, rather than explaining them. This function of games, generating understanding through experience rather than explanation, is what inspired the *Naked on Pluto* project to choose an online game as its medium.

The goal of *Naked on Pluto* is not to directly solve any privacy issues, but simply to make them more tangible. Seeing your own personal information, taken out of context and put in the hands of strangers, can be upsetting; and the experience of moving about in a world of constant surveillance and scrutiny, is altogether different from reading an article on privacy issues and social media. The game actively engages

you and other players in the story, so that you can discover firsthand what's going on behind the façade of this 'brave new world.'

I am in the Arrival lobby. There are lines of comfortable black leather benches, a spotless floor, big windows on one side, overlooking the splendid baroque architecture of the Palace, and exits to amusement and shopping facilities. It feels like I've just come home. [8]

The project uses Facebook as its platform for several reasons. First and foremost is scale: Facebook, with 500 million active users as of May 2011 is clearly the most popular social networking service worldwide. [9] Facebook has also done much to fuel discussions about online privacy, with its dubious policy changes and data leaks, as well as the discrepancy between the way it markets itself (open and self-regulatory) and the way it actually functions (a multi-billion-dollar business answering only to its investors). Another appealing aspect of using Facebook as a platform, is that Facebook makes it as easy as possible for anyone, without checking who and why, to access its customers' information. What is known as a 'Facebook application' is not software running on the Facebook platform: it is software running on any server, anywhere, outside of Facebook's control. The 'application' is in fact the authorization you give to this unknown software to access your data.

Naked on Pluto was inspired by the satirical text-based games popular in the 1980s. Two games were particularly thought provoking. One was *Hampstead*: the player starts broke and jobless, and attempts to eventually move up to one of London's 'posh' suburbs through a series of professional and lifestyle decisions. The other was *Bureaucracy*: the player overcomes a series of red-tape obstacles resulting from a recent change of address, eventually exploring the entire universe in order to set things straight. The critical tone and humor of these games were a welcome change from the goblin and wizard-ridden text adventures popular at the time, demonstrating that games can be critical as well as entertaining.

Naked on Pluto's satirical sci-fi atmosphere is created purely through text descriptions. The mix of personal data and fiction, combined with the use of text, appeals directly to players' imaginations. Those who allow themselves to be immersed in this strange and destabilizing world are treated to a somewhat bizarre but magnificent journey. To start playing, you simply log in using your Facebook account. When you enter the game, you find yourself on Pluto, naked as a jaybird, in a city under the rule of Elastic Versailles, a corrupted Artificial Intelligence. After buying yourself some clothes – a cowboy hat, diver's helmet or shepherdess bonnet – you're ready to start exploring the city.

Elastic Versailles appears to the player as a capital of convenience, a non-stop, 24/7 zone of endless pleasure. You can stroll through the palace gardens, go clubbing, or meet one of the marketing bots dedicated to making you aware of all the stuff you want to buy. There is not a dull moment, with plenty of visitors to talk to; some of whom you might know personally – although it is sometimes hard to tell whether you are dealing with a friend or a bot. Do not worry if you accidentally find yourself in a somewhat less polished area of the city. Everything is under control, as long as you return at once to the entertainment facilities.

Specialized bots such as the 'cleaners' keep the city tidy, putting all that has been misplaced back where it belongs, giving the city its elastic appearance. No matter what happens, everything slowly returns to its original state. Why would anyone possibly want to change things, when everything has been so excellently tailored to match your every desire? However, as you progress through the game, you find out something big has happened, and as you slowly peel away the façade, you discover the true nature of Elastic Versailles.

The interface combines two formats: the classic text-based adventure game (with a prompt to type in your actions) and the multiple-feed design of social media. The player is presented with overwhelming amounts of information, making it a challenge to figure out what is important and what is not in a 'Tweet-like' aggregation of feeds that is at once familiar and confusing.

The game requests permission from the user to access and use non-public profile information. After the start-up screen, users are prompted to log in to Facebook, after which permission is once again requested to access certain parts of their Facebook profile. [10] This requires trust in the application, which is not easily established. Paradoxically, the more often information and permission are requested, the less trustworthy the application seems. Even though the game asks for very little information, some users will find it difficult to agree; the 'artistic' context may give rise to the idea that the game can disturb their Facebook experience, by writing on their 'wall' or changing their profile information – even though this is not possible, since all permissions asked are read-only.

To make sure users understand what the application can and cannot do, the game (free software released under the AGPL license) has a very clear, short and straightforward privacy policy, explaining that the game does not store any Facebook information on its servers, other than the player's name and public Facebook ID number. All data generated during the game can be removed on request. All the Facebook data used in the game is only displayed to a player locally, on his or her computer – it cannot be altered by the application, and is not stored on any server, nor shared with any other players.

The developers are currently (May 2011) working on an improved homepage, with information on any privacy concerns users might have. Furthermore, trust will have to be established through positive user experiences and by word of mouth. The project's makers accept that when dealing with critical users, they will face the same healthy suspicion met by commercial applications. Those who do not grant permission for access to their profile are likely to already have an informed view of the issues the game is trying to raise.

The development of the game is combined with an investigation into how exposed we are on social networks, how our data is being used, and what this 'second life' in databases means to us. This research is documented on the project's blog, which contains posts on the project's progress, technical development and background. [11] Part of the blog is the *Plutonian Striptease* series – more than a dozen interviews with experts, owners, users, fans and haters of social media, covering a wide variety of views on this topic. *Plutonian Striptease* has been continued in the form of a lecture series during the LiWoLi 2011 festival. [12]

I am on the Farm. It looks like it was deserted a long time ago. All the windows are broken, the roof has caved in and birds have made nests on top of kitchen cabinets. There are puddles of water on the floor. It smells mouldy. [13]

Naked on Pluto tries to raise awareness of online privacy issues through gameplay and experience, while contextualizing the project through its blog. Of course, it will take more than just a game to improve the situation, but together with other endeavors aiming to raise awareness and to tackle through legislation the problems of online privacy, we can only hope that some day the game will become obsolete or unplayable, due to locked-down user data or total refusal by users to agree to grant any third-party applications access to their information. Until that day comes, the game can be played at <http://naked-on-pluto.net>.

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VERSIONS, COMMENTS AND AUTHENTICITY

Annet Dekker

When talking about representation and reproduction it is hard not to talk about authenticity. In this paper, I will discuss the changing meaning of authenticity, in which I will pay special attention to the influence of web2.0 strategies used by artists and museums. Questions that I will address: What does the Web 2.0 mean for art and authenticity? And, related, what does online participation mean? How do museums deal with user-generated content?

The Dutch/Belgian artist duo JODI are renowned for their reactions to the rules of the Internet and for posing questions about the limitations of coded communication. They have recently been particularly interested in the function of 'commenting' online. One of their latest works is *allyourvideobelongto.us*. The title is derived from the well-known Internet meme phrase, "All your base are belong to us," a poorly translated sentence from the opening scene of the Japanese video game *Zero Wing* (1989). In 2000, a video was made of the sentence that quickly achieved cult status on the Internet. The following year, when YouTube was temporarily shut down for maintenance, the site placed the line "All your video are belong to us" beneath its logo, as a joke. Many visitors to the site assumed it had been hacked and immediately phoned YouTube's office. The company was unable to handle the influx of calls and had to post further explanations on the site: "No, we haven't been hacked. Get a sense of humor," "Apparently we can't spel [sic]," and "Please stop calling the office, we're trying to work in here." The "All your video are belong to us" line was later used by YouTube's critics in the discussion about the rights that the site asserts over the videos of their members. This issue is what JODI is referring to with *allyourvideoarebelongto.us*. This project involved JODI transferring home videos of people imitating their favorite singer onto vinyl. The artists rewarded the singers by placing a video of the long-play disc with all the songs on YouTube below the original video as a video comment.

When talking about representation and reproduction it is hard to avoid the subject of authenticity. The term authentic stems from the Greek 'authentikos,' meaning principal and genuine, i.e., what is represented and reproduced is regarded as authentic. Something is authenticated through negotiation and as such it can be regarded as a social construction. [1] The word infers authoritative certification that an object is what it is claimed to be. In cultural heritage, it is most often used to refer to the 'original' state of a work. This is not to say that the authentic is static, as David Lowenthal reminds us: "What counts as authentic shifted continually from substance to form to process and to images and ritual performance. Indeed, the very quest for authenticity altered its nature, just as subatomic particles are affected by the act of observing them. Cultural relativity made authenticity a capricious will-o'-the-wisp, even a contradiction in terms." [2] Authenticity on the World Wide Web is further complicated by the ease and tolerance of replication. Although artists have employed this strategy for many decades, the speed and accessibility of the network means that communication, visuals, videos and sounds can be readily transferred and copied within seconds. So, does the notion of authenticity still function within the World Wide Web? If it can, what does it mean now? Finally, how are the traditional keepers of cultural heritage – the museums – dealing with these issues?

Versions and comments

In 2009, Petra Heck, Constant Dullaart and I organized the *Versions* exhibition at the Netherlands Media Art Institute in Amsterdam. We invited several artists, including JODI, whose practice centers on reacting to each another. For these artists, the Internet is the place par excellence to quickly launch ideas, respond to each another or adapt existing work and reuse it. Through this process, photos, animations or videos rapidly grow into more complex, aesthetic artworks. Sharing and commenting on each other's work leads to questions about the position and perception of the work both in the context of the Internet and beyond it. For example, to what extent can one speak of the uniqueness or the originality of these works? Who determines what can or cannot be done? What happens to individual identity within the group process? And, of course, what is the significance of authenticity, appropriation and agency in the era of 'comment culture?'

Like JODI, Constant Dullaart is interested in YouTube, but he focuses on a different aspect: its formal aesthetics. In 2008, Dullaart made the video series *YouTube as a Subject* in which he took the functional YouTube play button as the subject of a quest for design and its use on the Internet, using video animation to make the button do everything from bouncing around like a ping-pong ball to blurring into a smudge. In this way, Dullaart elevates the play button to the level of an icon. Dullaart uploaded the short videos on YouTube, where they provoked a series of new video comments. For *Versions* he created a sculpture of another YouTube icon, the circling dots that signal the loading time for a video to start. The foam circles were filmed by visitors using their mobile phones and put online, resulting in new video comments by others.

In addition to individual approaches such as Dullaart's, increasingly more 'club sites' are emerging: *NastyNets* was one of the first 'surfers' clubs,' which are networks of people reacting to each other's postings by uploading new images and/or audio fragments characterised by their 'dirty' or 'trashy' style. *F.A.T. Lab* shares a similar approach; and there are many more examples.

The online is further recontextualized in galleries. A good example of this is the now famous work *Versions* by Oliver Laric (2009), with which he questions the notion of authorship. He does this not only by using existing visual material, but also by explicitly inviting others to supplement or alter his work. This complete denial of authorship seeks to create space for developing interesting things. At a certain point, *Versions* also moves into gallery spaces where it consists of sculptures, essays, videos and performances that exist simultaneously as equally valid variations on a string of thoughts. Although Laric claims to open up his work for everyone to play with and use, he seems most interested in having multiple versions of his initial ideas. So, how involved can the audience really be in works such as this? I wonder if this really constitutes participation or collaboration.

Collaborative and distributive practices

Some earlier online works deal with issues of participation, authorship and collaboration more clearly and directly. One example is the software *Nine* (2003) and its predecessor *Linker* (1999), both of which were developed by Mongrel (Graham Harwood). *Linker* allowed the user to easily store and link images, video, text and sound to other selected material within a grid of nine frames. These elements created a visual story. The *Nine* program works in the same way, but is an online tool rather than an offline one. *Nine* connects stories and facilitates exchanges between users. What is striking is that although the

hierarchical structure and system of accessing information are fairly rigid, they are visible 'on the surface,' rather than buried in the customary back-end solutions. This reflects the idea behind the project, which is to consider how structures are constructed and used. The network options offered are interesting because of this transparency, as is the way in which issues such as authorship and copyright are dealt with. When using other people's images, text or sound, the user cannot directly 'credit' them, but has to e-mail the author – not to get permission but to inform the author of their use. This allows the author to see how their material is used. In a similar way, an email is sent to the author when an existing 'word' (tag) is used. In this way, links between texts are semi-automated. As Graham Harwood explains, "*Nine* is software that is directly born, changed and developed as the result of an ongoing sociability between users and programmers." [3]

Another example is the website *Mouchette.org* (1996) by Martine Neddham. Mouchette existed on the Internet for many years, masquerading as a thirteen-year-old girl living in Amsterdam. She is the ideal imaginary friend who does and says things that many of us dream about but do not dare to do or say aloud. By turns seductive, cruel or sweet, Mouchette exposes the fantasies born from her dark imagination. She repeatedly triggers web users to participate: she answers e-mails that are sent to her, thereby reinforcing the notion that she truly exists. At a certain point, Mouchette invites visitors to her site to become part of the Mouchette Network. Once inside the network, they obtain a password and 'become' Mouchette. These 'Mouchettes' can upload texts and images to the website and use Mouchette's e-mail system – including to answer e-mails. In this way, several different Mouchette's came into being. Although the authentic work might still be visible, the authorial role is dispersed. This raises the question of what does and does not belong to the authentic work.

What is essential in these two works, what distinguishes them from those mentioned previously, is that they want to offer something to the participant, be it information, a platform, or a sense of belonging. What connects these two examples with the ones above is that they do not merely foster participation and collaboration in the sense of working with others towards a shared goal, but that they enable others to work with the material in their own preferred way; they are distributive, rather than collaborative, practices. [4]

Authenticity, originality and authorship

Artists who work on the Internet conceive of the authentic in a different way to those working with traditional media. Their work deals with iteration, versioning and repetition. The quest for originality is still important, but it is achieved in a different way, for example, by being the first to comment with a brilliant or funny idea. At the same time, commenting is a mechanism for establishing individuality, as participants combine shared meanings and play with the shared parameters of the group in idiosyncratic ways. Notions of authenticity are still relevant, but what form do they take?

If we refer back to Lowenthal's remarks on authenticity, one might say that authenticity has now become a process – more specifically a distributive process in which participation is key and the use of the works determine the appearance. Lowenthal also states that a claim of authenticity depends on who is doing the work. However, the notion of authorship is not always easy to determine, as we can see in Laric's work, which questions the notion of single or multiple authorship by explicitly inviting others to alter or supplement it. As Laric says, "There are endless versions of *Versions*. Sculptures, essays, videos

and performances all exist simultaneously as equally valid variations of a string of thoughts. *Versions* exists without a clear beginning and remains open end [sic]. It is independent of context and adaptive to site specifications. No single author holds copyright to any of the manifestations." [5]

'Authorial control' and 'audience participation' are magical phrases for the cultural sector, especially in relation to digital cultural heritage. Various types of participation are on offer, from active to reactive to passive: Do-It-Yourself (DIY); submitting your own content (creation); remixing existing content or working with others (co-creation); labeling existing content (tagging); making selections; exhibitions or tours using available content (clouding); exchanges within and beyond gathered or created content (sharing and networking); and pushing 'like,' or in some cases 'dislike,' buttons (clicking). In addition, connections are made with the world beyond the Internet by staging events that involve surprise, game elements and so forth; and this is just the tip of the iceberg.

From offline to online participation

What does audience participation really mean? What is possible? In what ways can this be compared to participation in the sense as referred to above; versions, commenting, etc.? The etymology of the word 'participation' starts with the Latin 'participare' (to participate), which derives from 'pars' (part) and 'capere' (to take). It infers action and the involvement of at least one direct object – something or someone who receives the action of the verb, i.e., actively participating *in* or contributing *to* a group. Taking this one step further, it can be argued that individuals should be involved in a group such that each of them participates in the group's activities, challenges and successes. It follows from this that participation also means that participants should feel that they are co-owners of the group process, the content and the product. The next question is in what way, or whether, the online experience has changed this notion of participation. It may be useful to take a detour here and look at how artists and museums dealt with participation in the pre-Internet past.

Seeking audience participation is nothing new in art practices: early Romantic-era artists formed groups that bemoaned the separation of art and the audience, [6] and these thoughts were underscored by Richard Wagner in his seminal essay, *The Art-Work of the Future (Das Kunstwerk der Zukunft, 1849)*, in which he states that artists should realize that the 'Folk', the people, are the true inventors and artists:

Not ye wise men, therefore, are the true inventors, but the Folk; for Want it was, that drove it to invention. All great inventions are the People's deed; whereas the devisings of the intellect are but the exploitations, the derivatives, nay, the splinterings and disfigurements of the great inventions of the Folk. [7]

Who, then, will be the Artist of the Future? The poet? The performer? The musician? The plastician? Let us say it in one word: the Folk. That selfsame Folk to whom we owe the only genuine Art-work, still living even in our modern memory, however much distorted by our restorations; to whom alone we owe all Art itself. [8]

Several radical art movements pursued Wagner's ideals, either by aggressively trying to provoke the public through staging events and collective experiences (the Futurists) or by more subtly addressing the art authority and the dissolution of artistic individuality and authorship (the Dadaists). However, these were short-lived movements that often ultimately became the victims of their own strategies as they rapidly lost their power to shock and provoke, and descended into repetition. Although these avant-

garde movements encouraged audience interaction, their inflexibility often led to their decline. Nevertheless, they did open the way for a rebirth of participatory art in the 1950s and 1960s: from the Situationists to Fluxus and Allan Kaprow's 'Happenings,' and from Andy Warhol's Factory to the present.

It is important to realize that the concept of audience participation in these historical examples involved the audience in events that were strictly controlled by the artists – they retained authorial control. In most cases, this meant little more than the artist(s) and audience being together in the room where the happening or event unfolded. Contrary to Wagner's ideas, only scant attention was given to the role of the audience, and participation was not seen as a collaborative and consensual process, as we like to think of it today. Has the coerciveness of the historical attempts to interact with the audience been overcome? Wagner's notion of the 'Gesamtkunstwerk' (total artwork) can now be created and realized through technical means; but would he be pleased with the random clicking or the competition that can derive from the many Web 2.0 participatory tools? Again, we seem to be far removed from Wagner's vision of the individual who, regardless of class or education, seamlessly merges with the masses. Or are we?

Conclusion

In many ways, the nature of participation has not changed: online participation still involves working on social or other constructions, but now it is made possible by network and database technology. The result of the work (the construction) may be temporary or permanent, and may have a free or structured form. This structured form is the bottleneck and it highlights the shortcomings of the definition of participation in an online context. The minimum level of participation in this context requires nothing more than clicking on a button to trigger an action: for many people, membership of online communities or popular social networking sites such as Hyves and Facebook already constitutes participation. However, we may be able to shed light on the nature of participation by examining its goal: online participation is sometimes an end in itself but it can also be a means to another end. The focus may be on the event itself (the experience) or its product (data, information, knowledge). In the latter case, the product can be the final result, or it can be an unfinished product that will be used, or reused, in another construction. In this way, the participatory action becomes one action in a chain of actions (at times using FLOSS principles), sometimes even without the participant being aware of it – as is sometimes the case in museum online participatory games, where multiple authorship goes uncredited.

The target audience for online participation ranges from small, specialized groups to the broader, general public. In most cases, however, online participation (like offline participation) requires someone to instigate the construction process – a director or an orchestrator who can assume many roles. People need to be motivated to participate, which also leads to the assumption that participants will be 'rewarded' for their participation – or perhaps even penalized for not participating. The benefits of online participation may lie with the participants themselves, with the director, with third parties, or with all of these at once.

Online participation may be fleeting or it may be a collaborative creation or activity – or both at the same time. Furthermore, it can be initiated, (re)activated or passive. In this regard, online participation is similar to offline participation. The greatest difference lies in the fact that the goal of online participation is often not very transparent. There might be a need to redefine participation when it occurs online, with the crucial questions in this context being: what are the producers of the participatory context actually offering, and what are the roles of both parties in the process?

The claim for authenticity depends not only on what the work is, where it takes place and who is doing it, but also who is paying for it, how long is it meant to last, and how is it marketed, or, better, distributed.

ACKNOWLEDGEMENTS

Thanks to Virtueel Platform, V2_, Netherlands Media Art Institute, and Digital Heritage Netherlands for co-organizing the Online Participation expert meeting in 2010, an event that was part of a collaborative innovation program initiated by the Institute of Network Cultures, entitled *Culture Vortex*. <http://networkcultures.org/wpmu/culturevortex/tag/online-participation/> (accessed June 2011).

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DON'T ANTHROPOMORPHIZE ME EITHER

LINDA DEMENT

A discussion of embodiment, entrainment and agency.

We believe we can control a robot with code and screwdrivers. We believe it is inert matter. We believe it is a creature like us. We believe it is nothing like the complex beings we are. We believe we created it. We believe it is a clever pet that never shits. We believe it obeys us. We believe it is a lifeless machine. We invest it with personality. We divest it of presence.



Fluid mess in 'On Track' installation, In Serial, 2010

BACKGROUND

I have been working in digital arts since the late 80s, primarily making interactive works of various kinds. Recently, I worked with robots for the first time, as a member of the collaborative group *In Serial*: myself, Petra Gemeinboeck, PRINZGAU/podgorschek and Marion Traenkle. We produced an installation

comprised of a mechanical mop, a muddy fluid mess and a troupe of robots whose task was to attempt to clean the mess, but who in fact increased it continually.

In our work as *In Serial*, I was particularly entranced by the interactions between non-humans; the idea that our machinery, robots and mess did not respond to or engage with humans at all, but were energetically entangled with and focused on each other. The mop communicated with the robots via infra-red signals. The physical nature of the installation and its mess impinged upon the robots' movements. The agitations of the robots released more fluid to the floor. Humans were bystanders.

We were working with pre-made off-the-shelf robots, the *iRobot Create*, which is a version of a commercially available domestic robotic vacuum cleaner. These were not purpose built for the artwork. They came with their own abilities, tendencies and habits in place, which made working with them, especially in the brutal, wet, sticky scenario we developed, quite tricky.

EMBODIMENT

I understand embodiment in a quantum physics sense – that the particles that form us are no different from and not divided from the particles that make up the rest of the world. There are no real physical boundaries between people, microbes, robots, furniture, food, garbage, gases, fluids, animals or any of the stuff of our world at all. There are only different formations, different dynamic patterns, being lived out in this one seething mass. Embodiment is densities, patterns, collections, constellations, drives and desires. Just as one cannot step into the same river twice, as its water is constantly flowing away and being renewed, the atoms that make up bodies are moving at lightning speeds around relatively vast empty spaces, appearing, disappearing, colliding and rebounding. We breathe in and breathe out billions of atoms with each breath. We incrementally exchange our atoms, cells, organs with each other and with the rest of the world, replacing about 98% of our atoms each year. [1]

In these densities, patterns and flows of exchange, I am interested in where consciousness, intention and agency reside.

Jane Bennett refers to, “[...] encountering the world as a swarm of vibrant materials entering and leaving agentic assemblages.” [2]

My self spills out beyond the boundaries of my skin, given that it is no boundary at all. Energies from elsewhere spill over into the formation I think of as me. Perhaps volition, will and intent are not restricted to humans, given that a human is not a separate discrete entity. Perhaps objects and ideas have as much personal volition as I do. Perhaps ideas are just a kind of ripple or current that moves various particles around within this vast soup of information, energy and matter. Perhaps it is constellations, fluid assemblages of apparently disparate actants, that effect agency, enact drives, ferment thoughts and conduct relationships. Perhaps fields of intention find material expression through whatever comes to hand.

In *Media Ecologies* Matt Fuller refers to:

[...] a combination of drives and capacities that, stimulating each other to new realms of potential, produce something that is in virulent excess of the sum of its parts. Indeed such parts can no longer be disassembled; they produce an ecology. Not a whole but a live torrent in time of variegated and combinatorial energy and matter. [3]

[...] the capacities of activity, through sensation and affect possible to each composition, whether organic or not are shaped by what it is, what it connects to, and the dimensions of relationality around it. [4]

The embodiment I am interested in is that surrounding, forming and propelling us as a system, a turbulence, an assemblage, of flesh, thoughts, machines, fluids, robots, programs, ideas, tables, rooms and so on – an embodied agency arising from the shifting, intricate, dynamic arrangements of our particular constellations.

ENTRAINMENT

Entrainment is a term used in physics to mean a coming into phase or sync. Early experiments, back in the 1600s, showed that pendulums set off at different rates will gradually come into phase with each other.

In geography, entrainment is the process by which sediment becomes part of a fluid flow. In meteorology, it describes a non-turbulent flow being captured by a turbulent one, as can happen when dry environmental air becomes entrained within a moist cloud. In hydrodynamics, it describes one fluid pushing or pulling another along with it. In engineering, it is the entrapment of one substance within another, such as gas in an aerated fluid or tiny objects caught up in smoke. In biology, it can describe physiological rhythms coming into phase with environmental rhythms, as in circadian sleep cycles, or the synchronization of whole organisms to external rhythms. In new age alternative health gadgetry, it is delivered to our brainwaves via flashing lights and audio pulses. [5]

It is a physical, material, energetic coming into phase, a confluence, a synchronization between inner and outer; between this and that, within beats and flows.

Music articulates our limbs. It directly addresses and shifts the muscles, bones and joints. Our feet begin to tap; our shoulders are swayed by the beat, by the pleasure of repetition, by the force of a tune. We can be swept away and lose ourselves, abandoning thought and self-consciousness, or we can be barely aware of some small dancing of a toe while our mind is importantly solving problems in a concentrated chatter.

Conversely though, the beat might repel, might induce a rebellion of the limbs rather than choreograph them. If I am in the mood for some thrash punk and I walk into a cafe where they are playing swing jazz, it will push me, irritated, back out onto the street while part of me cries uselessly, "But I just want a coffee." If I am craving the quiet joys of the Tord Gustavsen Trio but the cafe is bellowing Henry Rollins, as much as I love Henry, I will be pushed out the door the same way. I am not in the mood.

The participants in an entrainment need to be just that. The rhythm will not take and the sync will turn to resistance, if the parties are not willing, if they have no affinity. Maybe the geographer's sediment

must have an attraction to the flow of water. Maybe the gas bubbles must want to aerate the engineer's fluid. Certainly, my limbs must have a tendency, or at least a tolerance, toward the beat that lifts them.

RABBIT / ROBOT

A rabbit moved in with my girlfriend and I a number of years ago and to start with there was constant struggle of wills. Rabbits are not smart enough that you can train them. They simply do what they feel they have to. The rabbit decided to make her home in the living room. We did not want her to. A lack of communication and understanding along with very different intentions and drives produces a brutal and stupid language. She bit us. We barricaded the door. She launched herself at the barricade and scrambled over. We bribed her with carrot. She chewed through our electrical cables.

Over years of frustrations and defeats, we became familiar with her ways, her world-view, and she with ours. The small, determined rhythm of her being and the distracted human over-thought rhythms of ours settled into phase. The arrangement, ecology or constellation found its form. We had an entrainment.

Like the rabbit, these off-the-shelf robots caused us some troubles in our attempts to control and direct. We frustrated the robots – tethered them, trapped them, told them to clean and prevented them from cleaning, perched them on high tables, even took away some of their senses. They disobeyed our programs, leapt off the tables, threw their tire tread and largely refused to dance to our tune.

Entrainment takes time, attention and proximity. It takes a recognition and appreciation of the force, intention, drives and will of the unique material-intelligent-energetic constellations in play. It takes willingness to participate and respect for the others in the mix.

ANTHROPOMORPHISM

Perhaps our first mistake is to anthropomorphize ourselves; thinking we are separate, cohesive, autonomous beings, in singular command of our thoughts, decisions and actions. In the robot, we see reflections and parallels of our imaginary free-standing, contained, independence in its similar ostensible autonomy, decisions and actions. We then believe we can control the robot with programming and screwdrivers. We believe it is inert matter. We believe it is a little creature like us. We believe it is nothing like the complex creatures we are. We believe, god-like, we created it. We believe it is a manageable, clever pet that never shits. We believe it obeys us. We believe it is a lifeless machine. We invest it with personality. We divest it of presence.

Yet we are not discreet entities and neither are robots. What if the particles we appear to inhabit are propelled by winds and flow forms of other ideas, other material particles and other energies? Perhaps impetus sweeps into us from the robot or beyond. Perhaps the robot's constellation, its arrangement, has its own intelligence, will and intention. Given that we are not materially separate from each other, nor in any way fixed, perhaps its will and intention animate us at the same time as ours drives them.

Perhaps this is also true for the table, the cigarette butt, the floor, the spilled coffee, the song on the radio, the ideas I read about last night – the other material and immaterial stuff of our world. Robots though, have a level of digital and machinic complexity that allows a more humanly understandable

reading, a possibility of communication, collaboration or contest that is not possible with a rock or a sandwich wrapper.

“A touch of anthropomorphism then, can catalyse a sensibility that finds a world filled not with ontologically distinct categories of beings (subjects and objects) but with variously composed materialities that form confederations.” [6]

Perhaps over time and in proximity, with a respectful recognition of vibrant material presence, the particles that seem to form the robot and the particles that seem to form the human, can come into entrainment and leave behind our anthropocentric arrogance first and anthropomorphism second. The exchange of atoms, the currents of ideas, the forces and phenomena of the sea of particles might manifest through some dissonant hum between human and robot fields of formation.

"[...] order is not imposed from above, by mind exerting its will on dumb material forces; it is intrinsic to the self-organising nature of the phenomenal world itself. When we recognise our participation in its co-arising patterns, we can claim our power to act." [7]

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MOVING SOFTLY FORWARD

Sara Diamond

This paper identifies themes in wearable technology practices within the context of research in universities and art and design schools as well as industrial laboratories to suggest opportunities for concentration of efforts and international collaboration. Research using biometric data, heart rate monitors, embedded sensors, blue tooth and mobile networks, conductive threads, soft circuitry, smart textiles and shape metals and other adaptive fabrics occur at sites in around the world. Where are these? Secondly, the paper begins to map these research efforts to the potential of take-up by adopters (fashion designers, healthcare, and security services as examples). Finally it suggests some opportunities for collaboration and points to strategies needed to bridge the gap between research or art and design prototyping and large-scale adoption.

INTRODUCTION

This paper reminds us of critical and technological concerns that were appropriate to an earlier phase of fashion and technology research. It then checks these against research in universities and art and design schools as well as industrial laboratories to suggest the breadth of current research. The paper begins to map these research efforts to take-up by adopters (primarily fashion designers) and then suggests some pointers to bridging the gap between research-based art and design prototyping and large-scale adoption.

1. WEARABLE TECHNOLOGY, FASHION AND ART RESEARCH - 2003-5

The *Wear: Smart Clothes, Fashionable Technologies* July-August Issue 16 of *HorizonZero.ca* identified the rising interest in wearable technologies:

Summer 2004's most glamorous fashions are about looking "intelligent", "adorable", and "well connected". Digital is the "it" colour this year, and clothing designers are hitting the runway with e-ink, electric plaid, soft plasma displays, barometric fibres, conductive threads and wireless chic. That's why *HorizonZero* has been combing fashion houses and tech labs around the globe in order to bring you the very latest technology-laced textiles and accessories. [1]

Wear argued that technological change in the form of smart textiles, new flexible materials and protective surfaces was allowing us to "protect and personalize" [2] our bodies in new ways, offering us a "second skin". At the same time the issue acknowledged the transformative impacts that mobile devices, whether a phone or mp3 player were manifesting on social and economic life.

function of garments? I noted, "The technologies that we deploy - digital (carrying and communicating from signals), material (inks, threads), biometrics (measuring and responding to our biological rhythms), nanotechnological (transforming with the chemical nature of our bodies) - are all temporal media". [3]

These qualities were relevant in relation to "something uncanny but tremulously exciting in the possibility that our clothes, our jewelry, our ornaments might speak for us - and with others - in explicit ways, and as intuitive, quasi-independent systems". I proposed the notion of "endogeny",

...the potential of internal, evolutionary, and adaptive change in these materials and their expressions. For example, can we make ecologically viable garments that change their form, their fabric and expression, and allow for an economy of reprogramming rather than one based on the constant consumption of new objects? How can we combine endogeny with exogeny, the creation of new interfaces that communicate with and between systems?[4]

In my editorial I posed a series of provocations to fashion and technology. First of all, were we able to understand and mobilize the individual and social temporal, event and memory-making

Further, there was the question of how might form and function not only serve elites but, "fit the needs of the majority (in terms of durability, affordability, cultural specificity, and beauty for example) rather than only the wealthy?" These questions retain their relevance in 2011.

In an examination of trends in 2004 Joanna Berzowska [5] divided practices and emerging tendencies into three fields – 1) **wearable computing** where individuals wear computers on their bodies, either as routine **mobile** technologies that are responsive to context and place or as cyborg technologies, primarily **headmounted** displays. 2) electronic textiles, "a knit or woven substrate that incorporates capabilities for sensing, communication, and power transmission, as well as interconnection technology that allows sensors or processors to be networked together within a fabric." [6] These materials offer the ability to change colour, adapting to landscape or personal contexts. A second set of applications use sensor arrays and embedded sensor technologies from biosensors, to environmental sensors, to audio, movement and pressure sensors. These can be "directed inward or outward;" [7] 3) **universal connectivity, using biofeedback, network, and monitoring technologies such as RFID**. These technologies can be used for medical compliance and safety monitoring and intervention. Berzowska asks, "What kind of information processing do we want to carry out on our bodies? What kind of functionality do we want to enable inside our clothes?" [8] She raised concerns that too much attention is being given to surveillance and monitoring, not personal expression.

To imagine the year 2015 the issue commissioned "windows". Maggie Orth's "Weather Jacket" raincoat could predict the weather and change qualities in response to it. It was cinched by a "Destination Belt" embedded with GPS that could guide the wearer through the urban landscape. Sabine Seymour's "Rescue" was a rugged thermal and water proof sailing garment system that would connect the wearer to their boat's GPS and emergency systems, while containing a hidden inflatable life preserver and an emergency beacon. Susan Jenkyn-Jones' "e-scapaid" was a brooch like device that would be recognizable by others and would transmit the wearer's dating preferences. Her kit included a smart dating card that could be left behind embedded with gaming clues about the wearer. Victoria Lawton's "Nocturnal Dialysis Nightware" used soft tubing embedded in a nightgown, electronics and micro technology to deliver dialysis while the wearer slept. In reviewing research and commercialization efforts in 2011 these projections are reflected in fashion, medical and security systems research.

2. CURRENT RESEARCH

Research capacity has expanded in the three fields that Joanna Berzowska noted in 2004: wearable computing (mobile, head mounted); electronic textiles and universal connectivity, using biofeedback, network, and monitoring technologies such as RFID. An online search by this researcher exhumes significant references and suggests that wearable computing has moved into the mainstream and has had significant take-up within biomedical engineering. Valerie LaMontagne's survey web site <http://www.valerielamontagne.com/wearables.html> allows the reader to gain a sense of the breadth of wearable research and design particularly in Europe and North America. The blog <http://www.electricfoxy.com/> provides regular updates on events, topics and people in the field. Sabine Seymour's two volumes [9] scope out art and design wearable technology practices and Bradley Quinn [10] describes emerging trends in textile research, such as new tensile materials comprised of nano fibers.

Research fields have grown exponentially, whether fitness, biomedical monitoring or security applications. Mobile devices, wifi, Bluetooth and related network technologies have become ubiquitous in the last seven years, stimulating a return to interest in the integration of mobile networks and devices into worn devices or garments. Inexpensive microcontroller systems such as the washable LilyPad Arduino or affordable LED systems have seen the growth of craft and DIY (do-it-yourself) applications. New materials such as shape metals have provided new opportunities for responsive fashion and accessories. Malleable voltaics support aesthetic and functional energy systems. Significant advances have occurred in textile research thanks in part to space agency and military efforts. The Cleoxa company blog notes, "We find materials that are highly resistant to abrasion, or extremely insulating...but the most impressive is the memory foam membrane, according to outside temperature, the molecular structure of the fabric changes." [11] Projects such as Future Force Warrior System (USA) combine bullet protection (textiles) with communication device integration (sensor, networks, monitoring). A notable area of expanded interdisciplinary collaboration is the field of health technology and design. For example Swedish student designer Marjan Kooshnia has created medical masks that, "give an aesthetic warning if the wearer is running a fever or the concentration of allergens in the air exceeds a certain threshold. The pattern printed with thermo-chromic ink changes color when the exhale exceeds 27°C." [12]

University research laboratories or networks amalgamating engineering capacity with wearable art, design and fashion and domain expertise (such as biomedical) now span a growing number of continents and countries. The recognized need for intensive cooperation between varied technological and design research is one of the critical turning points of this decade. Design is acknowledged for its aesthetic, form-finding and usability roles. Research into the components of wearable technology has also expanded. For example European intelligent textile research has grown through a focus on defense, medical and sports applications. In Germany there is the Fraunhofer Institute IZM and Stella: STretchable ELectronics for Large Area Applications, Berlin; in Belgium University of Ghent; in Sweden Chalmers University of Technology, Swerea IVF and the University College of Borås, Textile Department with a Northern European aggregate, NICE, the Nordic Initiative, Clean and Ethical - Fashion. The Smart Textile Network links Swedish researchers with businesses such as H&M Rowells, Eton, Ludvig Svensson, Borås Wäfveri, Sanden textiles and Kasthall in Sjuhärad, the Scandinavian center of textile, mail-order and e-business. Products vary from clinical medical use, to sound absorption, to fashion applications. Belgium is a contributor to smart textiles research. Projects by students at the University of Ghent suggest a breadth of investigations such as, "A self-heating sweater; a textile antenna; Are you still breathing? Measure your heartbeat." [13] Industry research has rekindled with Philips is leading research in developing light emitting textile substrates which can be washed.

Capacity in the UK exists at numerous institutions including the Universities of Nottingham and Bristol, Central Saint Martins and London School of Fashion, Distance Lab, Scotland. The University of the Arts London Textiles Futures Research Centre encompasses its four art and design colleges. Its mandate is to "undertake a clearly focused range of textile related research that facilitates technology translation and convergence, improving the interface between science and design, the exploration of sustainability, the expansion of the textile product/applications, and the redefinition of cultural and aesthetic norms". The London School of Fashion has created the Centre for Fashion Science with research in Responsive and Multifunctional Textiles. Textile Futures Central Saint Martins, "share a practice-led approach through which to pioneer new hybrid methodologies, harnessing computers, lasers and electronics along with emergent bio and nanotechnologies. With sustainability and a sophisticated aesthetic as a common thread, the members' diverse research expertise addresses the future fabric of life by engaging with fashion, interiors, food, biomedicine, the built environment and evolving social interactions" [14] The United Kingdom is home to several focused Masters degrees in wearable technology, for example The University of Wales, Newport, M.A. or M.F.A in Smart Clothes and Wearable Technologies. [15] All of these programs place sustainability in a critical location – an issue that was barely considered in the emerging years of fashion and technology research.

The European Union Framework grants have provided opportunities for large networks that bind together applications and component (substrates, electronics, fabrics) research. The SYSTEX Coordination Action for Enhancing the Breakthrough of Intelligent Textile Systems (E-Textiles and Wearable Microsystems) [16] addresses the medical, transport, protective, sports and wellness markets. Researchers have found ways to apply conductive textile yarns to create intelligent textile systems; others have integrated a heart monitor into a stretchy garment, thus affording it adequate contact with the skin. The EU PLACE-it: Platform for Large Area Conformable Electronics by Integration identifies barriers in interdisciplinary knowledge by building bridges with industry. SERVIVE led by the London College of Fashion investigates virtual worlds as a location for fashion ecommerce.

Canada has retained and built its research capacity in wearable technologies. Kate Hartman's Social Body Lab at OCAD University in Toronto links social awareness, art and design with a wide expanse of technologies, "Beyond the basic functionality of incorporating technology into clothing, the Social Body Lab focuses on meaningful and provocative interactions, questioning the relationship between humans and technology through working prototypes and fully manifested projects." [17] Hexagram in Montreal includes Ying Gau a researcher at the UQAM in fashion and new media, and a concentration from Concordia University: Joanna Berzowska, Barbara Layne and Ingrid Bachman. American engineering, nanotechnology and design programs include MIT, Georgia Institute of Technology (USA), Virginia Tech (USA), Carnegie Mellon (USA), Parsons School of Design (USA), the Interactive Telecommunications Program, NYU and Stanford University. Research has grown in Japan (University of Osaka for example has a focus on user-driven design), Brazil (Anhembi Morumbi University) and there are emerging centres in Australia (University of South Australia), Hong Kong and India (Institute of Apparel Management). Hong Kong Polytechnic's Institute of Textiles and Clothing addresses electrical, textile and biomedical engineers as well as academics and fashion designers. They state, "Integrating electronics into clothing is a major new concept, which opens up a whole array of multifunctional, wearable electro-textiles for sensing/monitoring body functions, delivering communication facilities, data transfer, individual environment control, and many other applications. [18] The IAM is interested in the ways that intelligent textile manufacturing can be introduced into traditional fabric production methods as well as fashion applications.

Another significant change spurred on by advances in miniaturization and the accessibility of Arduino and other consumer electronics is the growth of a dynamic DIY culture. Electronic crafts have arrived at the foreground of wearable practice. For example Syuzi Pakhchyan's SparkLab "is a body of DIY projects that investigate between culture, technology and craft. It encourages a new methodology for assembling electronic circuitry which merges sewing techniques with electronics. Wires are substituted for conductive thread, snaps for solder joints and connection points, and everyday silk organza is used as the conductive medium." [19] She provides users and consumers with the tools, patterns and materials to create their own electronic jewelry.

There has been an exponential growth of artists' based research, providing a critical and alternate gaze at the growing trend towards monitoring systems that underlies much technical and commercial research into wearable technology. As electronics is standardized some artists have moved to new technology edges, for instance linking brain wave monitors or using electrochemical sensors to measure changes in sweat.¹ behavior. New media art centres now consistently host artists' projects in wearable technology. These include the V2_Institute for the Unstable Media (Netherlands), Eyebeam (New York), and the Banff New Media Institute (Canada). [20]

Concerns about the social impacts of wearable technologies that were expressed in *Horizonzero.ca* 2004 are echoed in the premise of laboratories such as those at OCAD University, Hexagram and the University of the Arts London. Unlike 2004, research projects in universities and industry are now explicitly focused on issues of sustainability and environmental impacts, concerns that were raised but not addressed during the early rise of wearable technology. Research concentrates on lowering power consumption as well as inventing new power sources such as solar or piezo electronics – energy harvested from human movement, thermal harvesting, solar cells and printable batteries. Helen Story is the co-director of the Centre for Fashion/Science at the London College of Fashion. She creates fashion art works meant to provoke environmental awareness such as Catalytic Clothing that cleans the air around it with purifying filters. Elena Corchero has developed a sun umbrella and other vibrant accessories that refuel each day with elegant photovoltaic panels expressing a pattern at night. Ying Gau of UQAM states, "Le thème central de mon travail est l'environnement, qu'il soit social, climatique ou urbain...je travaille sur la problématique du vêtement en tant qu'objet de médiation entre l'homme et son environnement physique et social." [21] Discursive forums such as the May, 2011 Wearable Technologies: Cross-disciplinary Ventures on –empyre soft-skinned space investigate the growing presence and integration of wearable technologies in media, military and fashion wear and the impact of these trends on how the body is represented, controlled and understood. Some of these concerns have filtered into commercial fashion and technology. We are still far away from the integration of "endogeny with exogeny" of recyclable and sustainable fashion.

3. DISSEMINATION AND ADOPTION

Seven years later the fashion industry is integrating wearable technologies, often using tools that were previously in prototype phase and are now more resilient. Fashion offerings revisit projects that artists and adventurist designers once sketched or prototyped. Take-up has grown in the fashion industry. While labour intensive to make and hence limited in reproducibility the couture demonstration projects have an aesthetic depth. When Lincoln Phillip searched for fashion industry interest in wearable technologies in 2004 he only found works by artists and designers on the edge of industry. This year the digital media content showcase South by South West in Austin, Texas included a wearable technology show. The 2011 Consumer Electronics Show in Las Vegas presented FashionWare. The runway featured mobile

enabled applications, LED systems and thermochromic inks. Designers, many of whom graduated from Parsons School of Design, MIT Media Lab, London College of Fashion, Central Saint Martins, were Connor Dickie, [22] Diana Eng, [23] Becky Stern, [24] Fang-Yu Lin, [25] Alison Lewis [26] and Amanda Parkes. [27] Their work brings us back to concepts presented in Wear! Horizonzero.ca as well as earlier works referenced on <http://www.valerielamontagne.com/wearables.html>.

In 2011 the blog *ChipChick – Technology and Gadgets from a Girl’s Perspective* proposed "Ten High Tech Fashion Designers to Watch". Zara Rabinovich elegized about the Rainbow Winters [28] line by UK designer Amy Konstanze Mercedes who uses "thermochromic and hydrochromic ink which alter in rain or sun, providing stunning visual effects, such as appearing and disappearing flowers and patterns" [29] drawing on a background of costume design for theatre. Anastasia Radevich’s [30] sculpted shoes diffuse light through fibre optics, activated by a switch at their ankle. Vega Zaishi Wang [31] applies electroluminescent lights to chiffon to sculpt out patterns that are revealed through the soft fabric. Slvr Lining [32] uses subtly placed solar panels in everyday wear to recharge mobile technology. Cute Circuit [33] is a London company that creates couture designs – at times for celebrities such as singer Katy Perry whose white dress flickered with pink LED lights to the beat of song with Kanye West. Her dress glowed and lit up when she moved. Several designers—Francesca Rosella of Cute Circuit and Diana Eng have spent significant time within the couture and ready wear worlds and their facility suggests a new sophistication as tested concepts are injected with strong design aesthetics.

4. SOME IDEAS ON COLLABORATION AND ADOPTION

There is clearly movement in the commercialization of smart textiles, wearable mobile technologies and wearable sensor systems, although analysts note that since the 2008 economic crisis large investments in intelligent textile products have mostly been among well consolidated brands; Nike, Adidas and Polar in sportswear and Viking Lifesaving equipment in PPE. [34] Consumer sports products such as integrated music devices and heated garments have grown. [35] Commercialization opportunities in the larger field target specialist markets - work wear, personal protective equipment and safety, with slower take-up in healthcare monitoring, in part because of privacy concerns. This latter field will grow with the rise of telemedicine, advanced applications in pharmaceuticals and the needs of aging populations who require in-home care and self-monitoring technologies. Intrusions into the fashion world are still minimal but there is persistence in the couture and accessory markets. The dream of large-scale adoption remains downstream, limited by the labour intensity of production.

One challenge is that the field is not yet demand driven; it is technology innovation driven. User-centered design would be of value. Mass market opportunities lie in practical needs and at least a component of design research needs to address these with aesthetically powerful solutions that are sustainable.

A second challenge is the need to use simple technologies elegantly. The uptake of thermochromic inks indicates that commercial designers are interested in pushing the aesthetic applications more than gadgetry that may break down.

A third challenge is how to best aggregate research efforts to avoid duplication and enable interdisciplinary capacity between universities, art and design institutions, design companies and potential distributors. International research networks are a strong means for such collaboration and dissemination.

A fourth challenge is the need to provide a comprehensive visual data base that can act as a resource to emerging designers and artists in this field. This would be a worth industry-based investment.

Finally, a critical assessment of the ethical, social, economic and environmental issues in wearable technology and its applications needs to continue. Engaging those outside of the art and design world in these dialogues through presence at industry forums is critical.

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DATA VISUALIZATION: MATERIALITY AND MEDIATION [1]

Sara Diamond

In 1997 I had taken up a performance persona of a zebra—an animal that seemed an ideal cathexis for debates about art and science—with its clonal mosaic patterned pelt, evolutionary stamina and creature stubbornness. Turing's calculations of patterns and intelligence through reaction-diffusion patterns were inspired by the zebra. The performances embraced and critiqued anthropomorphism, or more appropriately zoomorphism, engaging in ritual clowning in which the zebra could make statements without reprisal about the emerging culture of ArtSci and the desire for bonding between artists and scientists. When Peter Ride commissioned me to build a web site dedicated to ArtSci dialogues, I realized my site needed social media, at that time 'chat.' The inert and linear qualities of IRC and the impossibility of building dynamic dialogs with this tool prompted the decision to create a visual and nonlinear chat tool.

Erving Goffman emphasized the ways that conversation—a form of everyday performance—establishes a "participation framework" for sociality, an insight borne out by the growth of social media in this decade. [2] I was struck by the emotional (affective) qualities of individual posting and interactions and the ways that emotions appeared to impact participation and relationships. I sought a means to visualize the emotional nuances of, as Goffman puts it, "movements, looks, vocal sounds and speaking." [3] At the same time, social media could act as a collective memory, providing a viable tool for both realtime and archival use. These interests led me to create the CodeZebraOS, an online tool for collaboration, initially between the arts and sciences. CodeZebraOS brought a lateral collaborative structure to the linear hierarchy of chat. The system included casual language games that users could defer to when conversation became heated or overly somber.

The aesthetic for the software selfconsciously imposed a zoological and decorative beauty to online discourse, seeking links between data and their sources in biological sciences, zoology, human physical experience and overall materiality. Lushness was meant to connect the software to the physical world, eventually quite literally, because the larger project created interactive sensor-laden, soft wear garments, that responded to the OS dance performances and habituation cages (a joke about Pierre Bourdieu's notions of the habitus) [4] in which artists and scientists were locked up together for twenty-four hours under rigorous surveillance and expected to produce new discoveries or theories.

To represent multiple affective states I built eight other distinctive creatures (loosely grouped using a system similar to the Plutchik model of emotions) [5] all with voronoi patterned skins in a relational ecology. The structure of voronoi patterns (conveniently similar to early JAVA prototypes) meant that every time a posting was added the visual chat world readjusted the world view. Extensive user testing showed that grasping a reading of each animal pattern was not intuitive for users, but once they learned how to play with CodeZebraOS, to manipulate and tone conversations, they embraced it.

Invoking reaction-diffusion inevitably led me to considerations of scientific aesthetics that privileged simplicity and symmetry. I knew CodeZebraOS was cognitively challenging but I liked it that way. In examining a wide number of visualizations created by artists, designers or computer scientists, I found on one hand a shared data structure, but also tropes and metaphors. However, there was also a resistance within some scientific discourse to the affective, 'beautiful' qualities of these metaphors. There was a resounding imposition of natural metaphors, even when the source code like mine had no relationship to nature.

Infinitely precise scientific instruments, the digitization of analog material, the explosion of digital storage capacity, processing power and the Internet have, for the first time in human history, combined to produce massive quantities of data. The amount of data produced; which includes consumer buying patterns, text corpora, genomic and cosmological data; poses us with unique challenges. In this era of big data, access to data sources and appropriate tools to analyze data is as important as water and oil. The growth of cloud computing, visual search engines, penetration of fast broadband and wireless networks have all created an ideal environment for an explosion of capacity in data visualization. Data visualization is growing exponentially in scientific, social science and even humanities research, as well as in commercial applications such as social media.

Our expectations of the intelligibility and accessibility of data have shifted with the growth of databases and search technologies. This situation creates an expanding demand for tools and expressions that facilitate finding information and analysis. In the last decade strict prior separations between scientific visualization and information visualization have eroded. Firstly, entire new practices that cross the boundaries of information and science, such as genomics and bioinformatics have come onstream. These fields rely on data visualization to excavate structures in large-scale data sets they have no photo-realistic technologies to fall back on. Secondly, as Lev Manovich has remarked, data visualization allows representations to be mapped onto each other, to compare and overlay vastly different data sets, permitting the representation of infinite permutations and complexity. [6]

For these reasons my university, the Ontario College of Art & Design University (OCAD U), York University and the University of Toronto (UofT), created CIV/DDD, a research hub for the development of next-generation data visualization techniques and their underlying information processing and communication technologies; in partnership with communications industry, financial sector, green tech and ITC partners, biomedical researchers and physicists. The range of partners suggests the vast territory of data visualization applications that have emerged. This interdisciplinarity also requires attention to questions of design, aesthetic histories and methods which we have built in the framework of the project.

Aesthetics structure experiences in formal perceptual ways and provide interpretive tools, at times constructing meaning. Given that sensory expression most often visual, but sometimes sonic or tactile is the only means to perceive many contemporary data sets aesthetics are fundamental, not additive to the emerging field of Data Visualization. Data are mathematical: comprised of a set of organized measurements created by instruments that calibrate quantifiable qualities of an original source (natural, artificial or recombinant). Data sets are shaped by prior decisions; such as the instruments chosen to collect the data, the structure of the database, source and sampling methods and software choices. [7] These elements implicate data and put a mediating frame around notions of objectivity. The data source remains present hovering as a ghostly presence and yet is translated by the digital and is always in part lost in translation. Aesthetic realism implies exactitude when there may be ambiguity in the data. Data are a mediation of actual phenomena an immaterial material a contradictory mix of abstract points or numbers and producing phenomena. Data become information only when they are placed into an interpretive context. [8] This requires building algorithms that allow for selection, extraction, organization, analysis and presentation. It is the representational act of transforming both data and the data structure into a visualization interface that allows the user to interact with the data. The resulting images create a bridge between the empirical world and the viewer, revealing patterns of the source data that evoke interpretation.

Visualizations allow the comparison of a set of values; the illustration of relationships between data points; the indication of the parts of a system and the relationship and interaction of these parts; the creation and interpretations of maps; the tracking of change over time; and the analysis of text.

Data Visualization offers the possibility of fundamental new insights, a moment of understanding that reveals hidden processes or complex relationships, breaks through existing barriers and sharpens the focus on knowledge while providing visual pleasure.

RETURN TO REALISM

In an article titled *The Petabyte Age* (2008), *Wired Magazine* recently declared *The End of Science*. Editor Chris Anderson argued that scientists must end hypothesis and experimentation; instead, science must move entirely to data analysis derived from 'big data' sets that lie beyond the natural limits of human comprehension and require "dimensionally agnostic statistics." [9] The more scientists learn about physics and biology, the harder it becomes to create testable models. Instead, Anderson argues, researchers should search for patterns and relate these to the data's source to build a fresh analysis, working with pattern recognition and theorization from the abstract back to the material world. While I agree with his observations on the potential for new discovery, Anderson's view proposes big data as providing the means to rescue science from subjectivity and speculation, and offers a reversion to scientific realism and objectivity, in which data stands in for the real.

The tenants of scientific realism propose that there is a universal shared world of perception that makes up common sense, and discovery manifests this world through shared understanding. [10] The aim of science is to accurately describe reality. The empirical world, including its invisible dimensions and its description through analysis, thus becomes of paramount importance. The rationalist roots of scientific realism suggest that perception leads directly to action, and presupposes the alignment of reality and image. Scientists that I have worked with argue that it is necessary to keep the metaphor close to the look (whether observed or photographic) of the data's source. [11] Yet the aesthetics of scientific realism may create limits to imagination, tying visualization too tightly to "analytic reasoning," which could fail to deploy the transformative power of visual experience. [12] A further challenge to realism occurs when the source cannot be seen, only measured and then imagined.

Debates regarding scientific realism have included some recognition that the observer, whether an instrument or a human, has an impact on the means of expressing the data for an experiment. Karen Barad, a physicist and a philosopher of science, observes in *Meeting the Universe Halfway* that there is not a one-to-one relationship between the ontology of the world and its discovery, as is claimed by "the traditional realist." [13] The 'commonsense' view of Nature is continually entangled in the theoretical and experimental practices that mark its description, as is human society. Yet science still makes meaning of the sometimes invisible material world and we must pay equal attention to empirical research, as it produces ontological knowledge. These observations are equally true when considering large-scale information systems that are hybrid forms of physics, engineering, human and machine interaction.

The field of Data Visualization is compelling because it carries the traces of the empirical world and its instruments of measurement and representation. We need to think of data visualizations as technologies. Data visualizations carry with them the aesthetics and assumptions of their contributing technologies. Data visualization technologies absorb aesthetics of 2D and 3D graphics and animation systems, with their formal styles and malleability. In the past decade a new set of graphics tools some viable for online visualization, others only available through high performance computer networks or in the laboratory are available, as either open source (such as Processing) [14] or proprietary software. The more finished the tool, the more that styles and capacities are embedded. Artists, designers and computer scientists continue to build and adapt tools to their specific needs. Mashup techniques transcode data from more than one source within single integrated tools and search engines allowing the ability to mix what were once discrete structural approaches to data types. Each new source of data adds its structure, aesthetic properties and limits. Whitelaw dubs these practices "databending," [15] as they layer contexts and can allow for the emergence of new imagery or meanings.

Not surprisingly, the most illustrative scientific visualizations draw from or map onto photographic imagery. An example might be an image of a 3D model of a virus structure in which six different proteins are interacting in complex ways. The data was captured using electron microscopy. The visualization is built in Chimera, a C++ and Python software package built to assist in molecular graphics. [16] Scientists had already discovered the symmetrical structure of the virus and had faint images of its form — the

visualization is built on top of the image that the microscope captures through 3D modeling. The visualization extends scientific knowledge by allowing the user to manipulate the virus to understand how its multiple layers might interact and penetrate cell walls. Layering, color and interaction experience were key aspects of the aesthetics that designers brought into play.

The next images represent 3D vector field texture based volumetric flow visualizations of tornados. [17] While the application is specific to storms, the algorithm, data structure and metaphor are of value to multiple disciplines that study flow such as mechanics, physics, meteorology, medicine and geology. [12] Advances in texture mapping graphics capabilities makes these images possible and combines with depth sorting, illumination, haloing and color attenuation to enhance perception and depth. [13] The images are aesthetically compelling, drawn by the computer from the data points and able to capture the dynamics of a storm.

The next image is a 3D visualization of a solar storm that occurred on Halloween 2003. NASA's visualization laboratory created it by combining a model of the earth with "daily averaged particle flux data from the SAMPEX satellite by propagating the particle flux values along field lines of a simple magnetic dipole." [18] By making flux and field lines visible, it is meant to illustrate the ways that energy particles from the solar storm transformed the structure of the Earth's radiation belts. Design decisions are apparent in this quote, "The colorscale on the cross section is violet for low flux and white for high flux. The translucent gray arcs represent the field lines of the Earth's dipole field." [19]

These examples bear close resemblance with what science has previously discovered or represented through photographic media, yet each seeks to extend that knowledge in speculative ways through design decisions that move the image into a field of visual analysis. These images operate within a tradition of scientific description as tools for deductive reasoning.

The use of literal metaphors in data visualization may suggest a level of accuracy that is impossible to achieve. After all, a visualization of Internet packets is many degrees of separation away from the conditions of production of that packet and of its producers. Science itself contains variant views of reality and its analysis is contradictory and chaotic, with different worlds episteme and ontology side by side. New trends in science acknowledge phenomenology, complexity theory and emergence. There is recognition that complex systems are difficult to predict and represent. A further challenge to realism occurs when the source cannot be seen, only measured and then imagined. The strength, not the weakness, of data visualization is its ability to use algorithms to present emergent properties and different points of view.

Case studies of visualizations working with the same data set underscore how data sets are shaped by prior decisions, such as the instruments chosen to collect the data, the structure of the database, source and sampling methods and software choices. Metaphors need not be literally tied to the data structure

to be meaningful, as the following interpretations of two sets of data that analyze emotional expression represent, firstly in components of the Globe and Mail, Canada's national newspaper; and secondly in online service dialogues of Canada's banks. This work is an extension of my earlier research, a cross disciplinary team coled by computer scientists Anjun An and Nick Cercone; myself and Fanny Chevalier as visualization researchers, are creating extraction algorithms, an analysis system, and set of visualizations with the work of student researchers Symon Oliver, Guia Gali and Jarrod Wilson.

The digital version of the Globe and Mail, like its print edition, includes a wide variety of sections, ranging from News, to Business, to Life and Sports. In going digital the publication has added commentary in the form of opinion blogs by its core of writers, as well as ample opportunity for readers to vote and comment. Editorial and business leadership at the Globe and Mail see value in understanding the emotional content of their various sections, writers and readers, and how readers might use tools to choose articles. Editorial leadership is eager to better manage the means for reader commentary. Discovering sentiments, patterns and relationships embedded in articles as well as comments is important for tracking the newspaper's role in shaping public opinion on contemporary issues and the ways that readers interact with these opinions. It can help media analysts better understand the impact of sentiments on news events. Our research analyzes emotional expression in all of the critical features of the publication. We compare sections, blogs and articles and look for underlying patterns in emotional expression using data extraction and visualization. We are using a unique contextbased approach in identifying the underlying emotional tone of text by combining machine learning, semantic analysis, and computational linguistics techniques. The system is being implemented and evaluated on annotated data sets, such as blogs and user comments. The bank data provides an analysis of users' ratings and comments of comparative service offerings for Canada's major banks.

The point is that formal strategies and metaphors differ radically in all examples. Each offer different models of interactivity, whether passive viewing, building one's own visualizations, adding one's own data, or flowing data through the metaphor. Gordon Kindlemann proposes that the very power of data visualization is that objective and subjective views cohere, inspiring new insights. [20] These works prove that very point.

UTILITY AND BEAUTY IN DATA VISUALIZATION

Given that data visualization can assist fundamental discovery, or influence social policy and economics, it is no surprise that in the past the application of data visualization has been motivated primarily by the teleological (willful thinking and predictable outcomes), with regard to both the goals of human activity and the ways that machines or tools can serve these. Visualizations are understood as utilities, translating data into meaningful communication that can represent reality and increase productivity. Edward Tufte proposes that data visualizations are "complex ideas communicated with clarity, precision

and efficiency." [21] Perceptions about realism, common sense and the ways discovery and insight occur have a direct impact on notions of beauty in data visualization.

Despite examples of aesthetically demanding yet instrumental work, such as that of Jer Thorpe, a belief in realism and objectivity leads some scientists to suggest that attractiveness is equal to subjectivity or illegibility. Ben Mathews assigns aesthetics to functionality and ease of interface use. Rapid comprehension is then the goal of this design aesthetic. [22] Simplicity is closely aligned to Occam's razor or *lex parsimoniae*; the mathematical and scientific view that the simplest solution is the best and most common sense one. Aesthetics are biased towards the symmetrical and highly legible with a spare Modernist look.

The acceptance of beauty in scientific and informatics imagery differs between generations and types of science and designers. As visualizations of the truly imperceptible nanotechnology world proceeds, imagemaking becomes generous. Andrew Vande Moere maintains the blog infosthetics.com, one of the key sites for debates about the practice of data visualization. He argues for lush images, "The best works are those where the aesthetics help people understand the data, where they're almost telling a story." [23] Beautiful visualizations compel not only experts, but also the public convincing them, for example, to adopt energyefficient practices. Legibility, instrumentality and beauty need not be discordant.

Yet currents of thought in art and design argue for the data visualization practices of both fields to be separated. Caroline Ziemkiewicz and Robert Kosara propose differentiation between pragmatic data visualization that allows efficient reading of data, and artistic data visualization that uses data in abstract or metaphorical ways. [24] Kosara feels that creative interpretations can "hurt perception" when fast analysis is needed yet can result in "sublime" or "contemplative" experiences at other times. [25] Mitchell Whitelaw (who has a terrific piece in the exhibition) argues that artists should not allow their data visualizations to become designs, that is, an "aestheticized (and perhaps functionally impaired) form of scientific data visualization." [26] These positions legislate a separation between a teleological usevalue and an intrinsic aesthetic value. Extracting meaning and insight from these representations of data requires powerful aesthetics that balance emotion (such as awe), contemplation and deep analysis.

Recent HCI studies such as those of Noam Tractinsky, A. S. Katz and D. Ikar demonstrate that users pay greater attention to beautiful images and that usability and beauty are viable companions. Jer Thorpe and Christian Flaccus's collaboration tree.growth.redux, from 2011, suggests beauty and visual clarity can align.

This discussion segues into aesthetic discourses about the sublime and the uncanny. Art and literature define the sublime whether nature or immense artificial systems as the threatening unknown that cannot be fully grasped by human understanding. Sublime imagery seeks transcendence, elevating the everyday to godliness. 'Raw' data stands in for nature (red in tooth and claw) and nature is extended to

the vast information web that constitutes the Internet and digital information. Data can be perceived as primary material — not produced concrete and objective, rather than contingent and relational. As I indicated, in the last decade of data visualization a predominate use of natural metaphors (treelike, floral, etc.) appears in art, design and programmercreated works, regardless of whether the source of the data was natural or artificial. The prominence of natural metaphors may indicate the merging of scientific and information visualization; it may represent mystification, the correlation of sublime nature and sublime data or an ironic stance towards mystification; it may suggest a growing sense of concern about the biological world, its extraction into data and the need for an ethos of responsibility towards the empirical world. Issues of aesthetics and ethics are present, if not visible, in the tools we build and use. Here are two different examples ironic versus earnest use of natural metaphors.

Some artists, such as Lisa Jevbratt, Barrett Lyon, or Christophe Viau shown below [27] describe emergent properties and systems as an evolutionary living force. Viau proposes that, "Morphogenesis art is investigating synthetic life by focusing on geometrical models of growth and pattern formation 'in silico.'" In the tradition of Artificial Life he seeks to build models that are so lifelike that they become life itself.

Jevbratt argues that genetic code melded with computer code signals a new sublime or unknowable, uncanny beauty. Jevbratt intertwines the materiality of data with programming (coding) as a material and conjuring practice. She says,

To write code is to create reality. It could be likened with the production of artificial DNA, of oligonucleotides a process where life is written. Or it could be seen as a more obviously physical act of generating and moving around material, an act that has dimensionality, which is nonlinear. [28]

Coding does act as a means of bringing a virtual world into being through the manipulation of mathematics (and its aesthetics) as manifested through data points and computation. [29] The study of data as a material with distinct properties (mathematical and indexical) must not throw away the constructivist wisdom that has allowed an analysis of the intertwined relationship between knowledge and its mode of production. While human intervention is required to produce meaning from the originating data (e.g. weather patterns, plant growth, or mobile phone use), the transformation process should not return to romantic notions of alchemy, affected only by a cognoscenti of programmers, artists and designers. The notion of an unconscious and shared 'natural' aesthetic is a problematic construction, as any survey of contemporary international art practice quickly suggests, art is bound by differentiation. In this view, perception is relational and contextual, constructed through the complex intertwining of object, maker and viewer. [30] These arguments require a located maker and viewer to militate against totalizing notions of beauty. Historical references to 'nature,' its relationship to culture and various past expressions, whether domestic chic or formalism, can serve as a double entendre, reminding us of the tension between the ontological and epistemic.

For some artists, an attraction to data visualization stems from the challenge of excavating hidden patterns and structures from the obliqueness of a data set, at times reconnecting these with the social or political conditions of their production. In his 2002 *Data Visualization as New Abstraction and AntiSublime*, Lev Manovich argues that visualizations of data by artists may create synthetic meaning rather than support mystification. [31] Manovich indicates links between early Modernist abstraction and contemporary artists' data visualization. However, the complexity and form of the structures that artists disclose have changed since the Modernist era, as have the conditions of belief: skepticism characterizes art, not early twentieth century optimism and essentialism. The formal properties of the database are lateral and associative. It privileges the paradigm (perception of the structure or theorization) over a narrative hierarchy.

Understandings of how to treat data as a material play out in the making of visualizations. Two approaches to design arise representing a bottom up/top down process. Edward Tufte argues that data visualization requires choosing data sets that are of value to the researcher, mining the data, creating a structure for the data, analyzing that data set to find meaningful ways to represent it, analyzing patterns, translating the analysis through aesthetic representation, refining the representation to better communicate, and creating means of manipulating the data. [32] In Tufte's view, data enunciate their own structures. There is no base case with data: it is inductive reasoning that pulls out knowledge. Through this process they find form, and sometimes also find metaphor or narrative. This may be viewed as data naturalism, structuralism, bearing a truth to materials approach, or, in working with largescale data sets representing phenomena that cannot be viewed, datadriven design.

Ben Fry proposes a procedure that begins with a narrative or story form. He argues that the designer must start not with the data set but with the empirical question asked by the researcher. Fry then works his way back to data. He considers the nature of the data to be obtained, finds data to fit the question and parses them to provide a structural fit for their meaning, then orders them into categories and filters out all but the data of interest. This approach maintains the role of the scientist in producing theory (a base case), illustrating, testing and deducing. It also offers an opportunity for metaphor, design variation and the recognition of multiple interpretations of the same data set by different disciplines. Both approaches need comparative testing to see how each impacts discovery in the fields where they are applied. In both instances a challenge for artists and designers is to sustain a constructivist understanding of imagery while openly exploring the indexical properties of data.

In developing the research methods for our visualization network we have chosen to contrast these methods.

Data is assembled and extracted > Effective algorithms are produced to represent data qualities over time; to represent data qualities over dimensions; to represent change, as appropriate > Data analysis is

used to create a patternrecognition system and a structure > Analyze the qualities in data that can be represented and choose a metaphor > Protocols for participatory design in relation to datadriven inquiry and visualization are developed and tested for groups > Participatory design exercises with user groups (as above) > Aesthetics are developed and tested that fit the structures and patterns > Dataled visualizations of extracted features/patterns occur > Userled visualizations of features, and aesthetics occurs, comparing data sets > Effective means are sought to create interaction with the data as represented > Modeling methods for complex phenomena across different data sets are applied (social media, biological, physics) > Visualization tools are created that allow the analysis of differentiated data sets and these are compared for similarities and differences > Results are contrasted and compared results > Use and usability testing is undertaken for tools > Selection, adaptation; development of analysis tools > Visualization tools tested with commercialization partners.

CONTEXT AND COGNITIVE SCIENCE

Data visualization requires both the awareness of cognitive aspects of human visual apprehension, such as color theory and the need to make the visualization meaningful to a user's context. In a muchquoted statement, Edward Tufte describes graphical excellence as "that which gives the viewer the greatest numbers of ideas in the shortest time with the least ink in the smallest space." [33] Ware proposes that Data Visualization is the scientific study of "distributed cognition" between pattern mechanisms in the human brain and the algorithms that map data to the computer connecting human cognition, computer memory and its related algorithms, and the physical actions of the user. [34] Indeed, successful design requires attention to the physiology of the brain, hand and eye. However, these formulae describe a mechanism at work in the perception of visualizations but are bereft of understanding the ways that human experience differs from machine, encompassing the nonlinear as well as inductive processes at work. Unfortunately, because of the focus on treating data visualizations primarily as utilities, much cognitive science research in the field studies techniques of performance enhancement, that is legibility and speed, rather than breakthrough discovery or the play of poetics or insight.

Ideas about nature, reality, culture and common sense play out in the field of Cognitive Science. Like scientific realism, cognitive science has gravitated towards a Kantian notion of 'common sense,' which encompasses logic, morality and aesthetics. [35] Immanuel Kant promotes logic, equating it with purposefulness and demotes aesthetic judgment as mere taste. Of more value may be Kant's proposal that aesthetics are a transaction between the artist, the object and the audience, suggesting that the viewer completes the image. This is a process wherein an embodied subject is in constant formation, in a state of 'momentariness' akin to Gilles Deleuze's notion of becoming and allowing insight and awe. [36]

Valuable lessons from cognitive science can help designers and artists to understand the differences between reading and viewing, and the ways that visuals can allow pattern recognition and text can act to lock down meaning and context in visualizations. These lie in parallel to current theories about the

image that reside within visual culture studies, locating aspects of cognition outside of conscious grasp. A cautionary note is required here as well, for poetics makes use of language to create patterns and graphic fonts, such as Forte or Bauhaus 93, or indicate that stylistic signifiers overcome the content they may contain. These boundaries further dissolve in the popular field of text visualization, where semantic and social networking relationships are discovered through visual and textual patterns.

Equally problematic is the tendency of many twentieth century cognitive scientists to universalize perception and cognition. Contrary research from other strains of cognitive science suggests that context and culture effects perception, and that viewers have different experiences in relation to what makes the same data visualization effective. Rather than a normative notion of cognition, Francisco J. Varela, Evan Thompson and Eleanor Rosch draw on evolutionary biology to reject notions of fitness and optimal adaption. They adopt a "proscriptive model" in which diversity is "woven into the basic constraint of maintaining a continuous lineage" and "the evolutionary process both shapes and is shaped by the coupling with the environment." [37]

Hence learning and difference play key roles. Varela, Thompson and Rosch show that because understandings are culturally learned, categories, such as color perception, are not assumed to be objective; hence, "lexical classifications of colour can affect subjective judgments of similarity." [38] This formulation links perception and aesthetic categories together. Such an approach to cognitive science requires a mix of intrinsic and extrinsic factors in understanding the mind and allows a better understanding of cultural diversity. Sensory cognition remains of critical importance in forming judgments, and hence aligns with the need for aesthetics in the field of Data Visualization that take these processes into account. Providing different users with varied metaphors, even shifting color templates in the interface, can allow perception and analysis of the visualization.

Even when taking diversity into account, cognitive science primarily focuses on individual perception, rather than the emergence of hybridgroup experiences and collective identities as result of the new sociality produced by Internet communication. Warren Sack states that "aesthetics for the Internet needs to concentrate on producing the means for visualizing and understanding how social and semantic relationships intertwine and communities and common sense emerge." [39] He observes that new identities overcome cultural difference, although difference is the starting point. Perhaps it is more accurate to state that rather than a new universality, new particular and contingent identities form.

Visualization systems that represent collaborative efforts or discourses require an aesthetic that allows the emergence of common and collectively constructed experiences and identities. It is logical that designs with high degree of interactivity would facilitate the creation of new identities or "intersubjectivities," [40] a term coined by Vilem Flusser, for conjunctures where identities conjoin productively.

INTERACTIVITY AND IMMERSION

Earlier examples have demonstrated degrees of interactivity in data visualizations. Interactivity appears to be an important part of cognitive process, of learning by doing, engaging the body through navigation. The third space that Bruno Latour describes between subject, object and technology is the site of "interactivity, intelligence and creativity." [41] Ron Burnett offers the explanation that part of the power of the "third space" of technology-mediated experience for the participant is the opportunity to gain agency by learning the system and aggregating knowledge through play. [42] The same may be true of gaining visual understanding while navigating data sets. This leads to an aesthetics that allows users to exert agency through learning a system and even to adapt and change outcomes.

There are different levels of interactivity within digital media, so are there in relation to data visualizations. Some data visualizations simply provide navigation capacity such as the ability to click on or mouse over material that the user chooses. In 2006, Fernanda B. Viégas and Martin Wattenberg created Many Eyes [43] in order to popularize the use of data visualization and provide a tool kit for building visualizations. They hoped for at least three uses of data visualization: to interpret textual data, to analyze complex objects and to use visualizations to initiate "social data exploration." [44] This is a highly interactive site where participants can add their own data and they or other participants create visualizations from that data from a set of given templates. Users then export their visualizations to their social media sites.

Other forms of interactivity privilege the impact of the information flowing through the site in this instance data acts as an agent interactivity is the flow of data issuing from a stock market feed, a geological phenomenon or a conversation. Stock market feeds have been a fecund source for projects, such as Joshua Portway and Lise Autogena's Stock Market Planetarium depicted below. [45] The elegant and ironic installation plays off the scientific trope and information metaphor of cosmology visualizations, suggesting a new astrological universe of corporations and their stocks, as artificial life creatures mutate, propagate and die in the market, feeding off of its movements and making graphical transitions, clumping and influencing the weight of the depicted universe.

Interactivity and related cognitive processes imply a timebased experience. Navigating 2D and 3D visualizations often requires rapt attention. Building on Deleuze's writings on cinema, Hansen argues for an aesthetics that is appropriate to the temporal experiences of digital media. [46] Digital media create opportunities for humans to experience time and space in ways that stretch and extend their existing physical apparatus. Data visualizations of large and multidimensional data files occur on 3D screens and at times in 3D CAVE environments. These are full body experiences, where the user is navigating data in real time, performing discovery simultaneously or with retrospective thought. Aesthetics is mediated between the body and its object in a continual flow or becoming.

Data visualization can also occur as an illustrative sidebar to highly interactive social media activity. Social media companies commission visualizations to allow users to catalogue their resources and to better understand and organize their relationships with others.

Bruno Latour [47] and John Law and John Hassard [48] describe technologies as invisible nonhuman actors, affecting the performance of a social network or process. Visualization is a compelling strategy for some artists, a less disruptive and more aesthetic means to excavate technological structures that hold hidden hierarchies of power. In data visualization formalism and politicized deconstruction merge, by creating visualizations that reveal sociopolitical relationships within the data. Hence of importance are artists' initiatives to challenge the set of formal techniques and conventions that have emerged linking data extraction methods, structures, metaphors or metonyms. Artists offer a critique of the aesthetic norms of scientific and information visualization. In 1995 Simon Pope and Matthew Fuller created the Web Stalker, one of the first tools to crawl the Web and build a visual diagram of hidden relationships between domains and their hierarchical ordering, discrediting any notion of search engine neutrality. Its form is now common to many data visualization tools in social media.

An End of Modernity by sculptural artist Josiah McElheny is a tenbyfifteenfoot accurate artistic version of the Big Bang, which itself is much more than an explosion: it is the origin of space and time itself, initiating an expansion that occurs everywhere and has no center. A Thousand Points of Light, a visualization by Naeem Mohaiemen as part of The Disappeared in America Project by the Visible Collective/DanBergman is an animated map of mass detentions that occurred in the United States after September 11, 2001; providing information about the detainee and their country of origin. Viewers can update the map with their own data. Such attempts to enforce transparency onto technoculture and offer an overt critique of power relationships may be described as data deconstruction.

In *The Secret Lives of Numbers* (2002, 2008) Golan Levin and his collaborators Jonathan Feinberg, Shelly Wynecoop and Martin Wattenberg seek an understanding of which numbers reoccur more than others, "in order to determine the relative popularity of every integer between 0 and one million" [49] and to surmise about why this takes place; as well as finding links to the functioning of human memory, social rituals and the structure of commerce. In the face of our society's belief in the objectivity and power of mathematics Levin instead argues for the subjectivity of numbers and, by implication, data, stating:

Humanity's fascination with numbers is ancient and complex. Our present relationship with numbers reveals both a highly developed tool and a highly developed user, working together to measure, create, and predict both ourselves and the world around us. But like every symbiotic couple, the tool we would like to believe is separate from us (and thus objective) is actually an intricate reflection of our thoughts, interests, and capabilities. [50]

He is also playing with the conventions of data visualization, drawing on Edward Tufte and Colin Ware's rules of simplicity of display to comment on the aesthetic and practices of scientific visualization, and at the same time develop a malleable, beautiful and interactive visualization from data sets pulled from a wide range of search engines over a fiveyear period.

One of the most dynamic growth areas of data visualization is text visualization, whether the massive quantities of scientific texts, social media output, chat, or descriptive metadata. Artists with an interest in linguistics and conceptualism now turn to Data Visualization as a digital trajectory to linguistic intervention, semiotics and conceptualism.

Temporal structures define how textbased relationships emerge in the Internet, with synchronous and asynchronous experiences providing very different feelings, intimacies, and forms of consciousness. These pile on top of each other in layers, allowing social relationships and expressions to feel like a thick texture of condensed time. *We Feel Fine* by Jonathan Harris and Sep Kamvar bears an interest in affective expression and uses the measurement of text data to find it. [51] *We Feel Fine* builds emotional portraits of specific online populations by extracting expressions of feelings from Weblogs. The project provides six movements (like a symphony), driven by statistical analysis and data aggregation, and then reshaped by users' paths through the data. Feelings accumulate in mounds on the screen, quivering when the mousecursor passes over. The site is poignant and amusing.

Other artists are drawn beyond structural analysis to poetics. Data visualization becomes a means to write concrete poetry. In 2003, Brad Paley created *Textarc*, a tool that allows text to be processed; where key words are quantified and brought to the foreground. It has been applied to literature, bodies of conference data, calendars and other corpus. Stephanie Posavec explores differences, "in writing style between authors of modern classics" through her project *Writing without Words*. [52] An example is shown below.

Posavec parses text in an expressive and poetic manner to create works such as *Sentence Drawings* and *Sentence Length* as part of her series.

To conclude: data visualization aesthetics are always contextual, depending on the data source and equally, are read in context, whether by scientist, social media user or art audience member. Data do not exist in themselves, and data risk mystification. Many of the sources of data are already structured. The assumptions of these structures, the material impacts of underlying technologies and particular software and the pervasive presence of tropes and metaphors need continual unraveling.

Cognitive science has a key role to play in developing visualization aesthetics that privilege pattern recognition. Viewing complex 3D images and navigating through these requires eyehand coordination

and focused perception. Designing to facilitate, or at times disrupt, cognition requires that artists or designers draw from this body of knowledge. At the same time, cognitive science needs to recognize that visual expression carries with it the aesthetics and aesthetic traditions of its source technologies and the subjectivity of visual images at the most fundamental level.

Data visualization approaches deriving from the art world are of value in their own right, producing compelling works of art, and valuable as a means to raise new questions and approaches to data. Art's deconstructive tendencies are helpful in unfolding assumptions that are built into data collection and structure. Experimental, abstract, multidimensional, highly interactive works can be immersive and provocative; perhaps more so than simplified visualizations that are illustrative of prefigured assumptions. Aesthetics that can evoke and provoke other disciplines, yet draw from the formal and critical values of art, bear great promise. This is a field where art and design practices can be engaged in multiple layers of discovery of new forms of expression and of new realizations in the fields that are aligned with the source data be these genomics, physics, economics, or information theory prompting insights and reflection uncommon to contemporary practices of data visualization.

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METAMEDIUM (THE EXPANDED ALAN KAY)

Helder Dias

Considering the informational lines that cross the Human and the machinic, it becomes imperious to re-design the theory of new media around these facts. It's not enough to analyse the 'remediation' or to consider cinema as privileged precursor. The theoretical work shall be placed to a more general level and implies that the notion of mediation is understood in all its meanings.

Introduction

In the domain of biology and more specifically in the theory of evolution, we can define the extended field of conception as the totality of viable virtual paths that a certain evolutive stage can follow. As a classic example, all the books that can be written using the total possible combinations of the alphabet that produce words and sentences which make sense [1]. One of the actualizations of this extended field of conception is, for example, the tale where the author describes this process.

This brief introduction allows us to place this problem. Over the last decades, deep scientific explanations presented the biological and the psychological as the result of algorithmic systems. As an example, we can refer the evolution as a blind Darwinian algorithm [2], its cultural '*memetic*' extension [3, 4], the computational theory of the mind or the investigations around AI.

An extremely interesting fact, and not always explored in this context, is that also computers are algorithmic machines by excellence. The general knowledge of the outside world as a manifestation of an algorithmic system, associated to powerful computational iterative manipulators, allow us to delineate a space of research whose crossings generates new Human definitions of the 'so-called Human' [5].

The theoretical work shall be placed to a more general level and implies that the notion of mediation is understood in all its meanings. The nature, body and mind, are today seen as spaces of mediation so, a theory of new media, is forcibly a theory of the *meta-processes* that allow, feed and confer dynamic to the manifestations of design out of chaos. With or without the help of the mind. With or without the help of the computer.

Advances in science have resulted in the expansion of reality. For example, microscopes allowed us to know that, at an atomic scale, beyond the limits of our vision, there is a core of activity that sustains, articulates and helps to explain the permutations of that same reality. It is an epistemological change of extreme importance the one that is implicit in this recognition that there are limits to our capacity of perception and apprehension of reality through the senses. The importance is not limited to this finding, but also to the verification that many phenomena that surround us are made from these scales to which we have no access except by means of technical devices increasingly more complex.

Ultimately, this lack of access to these scales is a kind of standing invitation to an increasing reductionism even if, as experience has taught us, not always a full understanding of the phenomena is easier when they are reduced to its most essential components.

The past decades have highlighted further this divide between what we see and what we think it exists. To the molecules, atoms and elementary particles it was added a central element - the *bit*. The world around us is increasingly presented to us as a discrete, informational, storable and computable one. All this requires an even wider set of prosthesis to help us navigate and negotiate the meaning of that same reality, now composed of a multiplicity of information flows. We do not only refer to the prosthesis widening of the senses, but to the massive and distributed presence of computing devices, that help us cognitively by guiding us, filtering all consumed information, warning us.

Of course this view also has as a counterpoint, the open possibilities in terms of monitoring, quantification of the subject, control of unpredictability and calming of desires. Once again the analysis of technological development is organized between utopia and dystopia.

In short, it is indisputable that there is an increasing complexity in our relationship with reality, where the amount of information and stimuli produced involves the use of devices that render in some way, and supplement the limitations of our cognition. It is no longer just the sensitive flows that extend beyond the limits of our senses, it is all an informational machine that far exceeds us and apparently begins to dispense our actions. Where the first devices opened windows to the World because they broadened the reality, the seconds, computational, reconstruct and simulate that same World at the same time offering themselves as a model to explain it.

Metamedium

“Although digital computers were originally designed to do arithmetic computation, the ability to simulate the details of any descriptive model means that the computer, viewed as a medium itself, can be all other media if the embedding and viewing methods are sufficiently well provided. [6]”

Since the dawn of computing that seems to exist a dispute between the will to create a computer system directed to the universality and the difficulties inherent to the areas that do not manifest themselves as computable. This dispute had its push with the pioneering work of Alan Turing and his proposal of creating a computational machine, itself universal.

With hindsight, we can observe and highlight these two trends. The first one, already mentioned, the general attempt to host the real within the computer, and a second, related to the need to introduce increasing levels of abstraction that enable us to generate lines of communication needed to implement such a project in expansion.

Decades later when Alan Kay defines the term ‘metamedium’ the author presents the computer as an active simulator of all existing media and others to be established. Through the prefix *meta*, Alan Kay also ends up recognizing the need to increase the level of abstraction to find a common substrate where the various media may relate.

The *digitalization* of information and logical formalization of algorithms capable of replicating in the digital, operations hitherto circumscribed to the Human sphere, paved the way for a set of experiences that would redefine the problem of mediation.

In the interplay between algorithms and computing resided the possibilities of logic formalization and mechanic simulation of various fields such as biology, where blind algorithms mixed with evolutionary systems generate a design endowed with growing complexity.

It is for this reason that for the last three decades, the duality code-computation has become increasingly central in the analysis of diverse issues around the notion of humanity and in the appreciation of the dynamics that animate our interaction with the reality that surrounds us. The way the computer makes the code operable, sets up oppositions about their role in the general construction of the World.

We are among the authors who question computation not only as a metaphor, but as the effective way the World works in general, and works where computing emerges as active mediation, such as simulation and as a metaphor, but where it is recognized a irreducibility and a logical impossibility of formalizing the entire physical universe, culture and functioning of the mind.

Following these two pathways, it raises notions of extreme interest like the opposition between continuous and discrete, the problem of *digitalization*, the rationality and logic against the limits of computing or the increasing quantification of the subjectification processes associated to an economic system of attention [7].

In short, the expansion of the original formulation of the notion of metamedium is done in two directions, both underpinned by the duality code-computer: The first is *ontological* and the second *phenomenological*. In both cases we overcome the problems of simulation of the various media, to start looking at all of reality as mediation or its construction as the update of a complex set of algorithms.

It is essential to discuss the code and the computation because then you can draw conclusions about the current state of mediation and review concepts such as central interface, representation, simulation, emergency or unpredictability. Whether our focus directs more to the phenomenological problem of mediation, whether our interest focus more on the ontological question of production, we should question the recent theoretical proposals centred on the code, on software and computation, starting by reviewing some concepts that are interlinked:

- **Information.** Today we produce and consume massive amounts of information. The world continues to be presented to us increasingly as information: DNA, memes, information theory, and computational theory of the mind. On the other hand, the digital information is based on a process that involves making discrete sensitive flows, apparently continuous. The expressive richness of these various flows must be described by zeros and ones, which means the entry into action of a segmentation process.
- **Algorithm.** The information may be subject to change, processed, according to an algorithm. Science cut out reality and was able to extract clear rules on its functioning. Overall this is a system of growing abstraction that allows us to logically formulate procedures for the settlement of a given problem.
- Both information and the algorithm can be converted into **code**. These codes may have different objectives: to communicate, clarify or hide [8]. The same algorithm can be implemented using different programming languages.
- Finally, **computation**. The information available and the changes that can be produce through the formalization of algorithms imply that they should be counted in some way. We must not forget that the notion of computing is not limited to modern digital computers and can be scattered and be implemented in different ways.

In short, non continuous reality converted into information on which we can formalize algorithmic modes of operation, lends itself to be integrated in various computing devices that go by the name of computer (mobile phones, iPads, laptops, etc). All this because we have more and more computing power available in more places and scattered by surrounding objects. The process requires an input (a world of flows that can be converted into discrete elements), an algorithm (which structured in the form of code will guide the processing form) and an output (a significant return to reality).

The functioning of today's computers is based on a layered system, where the level of abstraction varies linearly. Level change, from top to bottom, is equivalent to moving away from natural language towards the digital world of zeros and ones, translated into electrical variations. In the reality that surrounds us, and in which the computational mechanisms are increasingly operating, there is also a similar stratification where the juxtaposed layers line with continuity the discreet components of the matter. Understanding this apparent structural proximity allows us to articulate the two fundamental observations regarding the functioning of the code and the computation.

The first analysis results from the fact that the discreet formation of both entities (reality and computing device) feeds, via the code, transversal computing cross-links and agencies. The consequence of this possibility of integration goes through a further and radical technical rigging of the sensitivity and for the construction of a reality on demand. As mentioned, a phenomenological problem added to the strangeness, the risk and unpredictability. An active and strong mediation.

The second approach runs deeper. It is not enough to articulate and highlight the presence of computation in mediation and the phenomenological appearance of what surrounds us, but to recognize it as a major element. Powered by the scientific view, the reductionism and the simulations, the computational views of the world seem increasingly strengthened. It is important to analyze this version that uses the computer system as a model of operation and see if there is something new in this association or whether it comes in the wake of other historical moments in which certain technical devices, such as the clock, also served as an explanatory model for the functioning of social and mental systems.

The notion of metamedium, starting from the base formulation which was given by Alan Kay, lends itself to serve as a tool to analyze how the overall computing has evolved Lev Manovich [9] draws attention to the fact that the generation of Alan Kay was responsible for the union between simulation (Turing's initial concern was the creation of a computing machine that was capable of simulating a wide range of other machines) and the media. A union that would receive an added impetus with the advent of graphical interfaces in the 80's. The consequences of this approach are extremely important because they mark a divide between the computational aspects and its expression. Over the past 30 years, the stratification of computing gradually hid the construction of the simulation through the code and changed our relationship with a computer in a more focused experience in the media. This transformation has been so significant that Douglas Rushkoff [10] uses the following expression: *Program or be programmed* to draw attention to the fact that, despite having more computing power available in ever more devices, we haven't built skills that allow us to manipulate the codes already established and that come to us in the form of software.

Conclusion

In short, today's review of the notion of metamedium can be very fruitful. On the one hand, because we can see more clearly how the computing rhetoric has installed itself in contemporary culture and how it

has produced clear reflections on the social organization and processes of construction of knowledge. On the other hand, beyond this more hidden presence computation continues to strengthen a mindset that sees the world as a metamedium, where algorithmic expressivity serves as an explanation for a wide range of complex phenomena ranging from the social to the mental functioning.

For everything that was said earlier, a theory of new media cannot focus only on the way the evolution of computing produces different 'remediations' [11] and new media landscapes. A theory of new media, present and active, requires the inclusion of the problem of simulation and computing as essential aspects of this field of research.

As we have said earlier, the nature, body and mind, are today seen as spaces of mediation, so a theory of new media is forcibly a theory of the meta-processes that allow, feed and confer dynamic to the manifestations of design out of chaos. With or without the help of the mind. With or without the help of the computer.

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DIGITAL PERFORMANCE IN NETWORKED PUBLIC SPACES: SITUATING THE POSTHUMAN SUBJECT

Marcos Dias

This paper analyses how digital performances in networked public spaces situate the posthuman subject through a complex interplay of human and non-human elements, highlighting the importance of embodiment rather than privileging information over matter. Through empirical research on Blast Theory's digital performance *A Machine To See With*, I attempt to analyse this process closer through a performative account of posthumanism.

INTRODUCTION

Since the late nineteenth and early twentieth centuries, the city has become associated with a machinic organism through the rationalisation of urban space and living patterns and consolidated through major infrastructure networks. The advent of cybernetics through advances in computational processes has extended the machinic metaphor to human life in the form of the posthuman subject, where information is assumed to flow freely between computational devices and the body, and where embodiment is downplayed or erased altogether.

This paper argues that the experience of the posthuman subject in digital performances in (networked) public spaces is defined through assemblages where agency is distributed between human and nonhuman agents, reenacting embodiment rather than privileging information over matter. It also suggests that the embodied posthuman practices enabled by these performances are better understood through a performative (rather than a representationalist) account that overcomes the inadequacies of a static or advantage point of observation and of assigning agency to individual and self-operating agents.

Through research recently conducted on Blast Theory's digital performance *A Machine To See With*, I analyse the (posthuman) subject's experience of digital performances in networked public spaces through the embodied practices generated by the complex interplay between (but not limited to) participants, digital devices, networked public space, the performance's narrative and bystanders.

THE MACHINIC CITY AND THE POSTHUMAN SUBJECT

Since the late nineteenth century, the all-encompassing infrastructure networks of modern urban planning enabled what Steven Graham and Simon Marvin defined as the "[binding of] the metropolis into a functioning 'machine' or 'organism'". This process is famously illustrated by Haussman's nineteenth century 'modernisation' of Paris, described by Chaoy as an attempt to "regularise the disordered city [and] disentangle it from its dross, the sediment of past and present failures" [1].

In *The Metropolis and Mental Life*, George Simmel exposed the objectification of life through the rationalisation of living conditions in the emerging metropolitan areas of the early twentieth century, arguing that "modern mind has become more and more calculating" and the world becomes an "arithmetic problem". Simmel argued that the "calculative exactness of practical life" is the outcome of the desire to "fix every part of the world by mathematical formulas". For Simmel, this desire was intrinsically related

to the practices of the metropolitan life, with its "punctual integration of all activities and mutual relations into a stable and impersonal time schedule" [2].

In Simmel's account we can identify the emergence of a posthuman subject, merging the machinic processes of the city and the 'calculating mind' of the subject. This link was highlighted by the Futurist movement in Italy, which emerged a few years after Simmel wrote *The Metropolis and Mental Life*. In *The Manifesto of Futurist Mechanical Art* (from 1922), the Futurists proclaimed that: "we too are machines, we too are mechanized by the atmosphere that we breathe...This is the new necessity and the basis of the new aesthetic" [3].

According to Steve Dixon, the aesthetics of Italian Futurist performance theory and practice between 1909 have been highly influential in contemporary digital performance philosophies and aesthetic practices [4]. However, he sees a significant difference in approach between both. Dixon argues that the Futurist's glorification of the machine and their focus on embodied interactive practices and audience collaboration allowed "human excitement [to be] projected outward". In the 1915 *Futurist Scenography* manifesto, Enrico Prampolini argues that: "[Futurist Theatre] is alone in seeking the audience's collaboration. It doesn't remain static like a stupid *voyeur*, but joins noisily in the action [...] communicating with the actors". In contrast, Dixon argues that contemporary digital performance directs human excitement and creativity inward and into small screens, in what he defines as the "introversion of the computer paradigm" [5].

We must examine Dixon's argument against what Malcolm McCullough describes as a "paradigm shift from cyberspace to pervasive computing", where digital technology "pours out beyond the screen, into our messy places, under our laws of physics" [6]. This process brings computers into the messy, noisy and unpredictable 'real' world. The rising trend of internet-enabled mobile phones (also known as 'smart' phones) is perhaps the most visible reminder of this shift, which is also supported by: gesture-controlled videogames consoles, computer tablet devices and RFID (radio-frequency identification) tags, which attach readable digital information to objects.

Therefore, rather than taking Dixon's account of the 'introversion of the computer paradigm' at face value, we must test it empirically against the innovative practices that digital performance enables through embodied practices. These involve a constant dialogue between participants, digital mobile devices and the surrounding environment, mixing virtual and physical environments and screens and the outside world. In contrast to the Futurist's extrovert approach of provoking their audiences through physical reactions, contemporary digital performances such as Blast Theory's *A Machine To See With* provoke and challenge the audience through much subtler techniques, such as automated phone messages directed to their mobile phones. While in this case the techniques and actions might be internalised, the participant's are by no means less challenged than in the Futurist's plays: they must deal with these messages while navigating the 'messiness' of urban public space, eventually generating unusual or uncanny situations that must be dealt with in a public arena. Therefore, the performative experience of the participant is neither lost nor diminished, and is perhaps more challenged than in the Futurist's collaborative theatre plays.

TOWARDS AN EMBODIED AND PERFORMATIVE POSTHUMANISM

An embodied and performative posthumanism challenges the desire to control and/or predict the body's responses through normative and synchronised processes. Performing is always already a transformative, iterative and unpredictable process and highly context dependent. While modern urban planning attempted to control the body by standardising and synchronising the flows of infrastructure networks and the circulation of people through the city (as in Haussman's 'disentangling of the city'), the cybernetic movement emerging after the Second World War envisioned the control of the body through the control of flows of information.

As Katherine Hayles reminds us, the construction of the cyborg as a (posthuman) "*technological artifact and cultural icon*" was supported by the "conception of information as a (disembodied) entity" where "protein and silicon operate as a single system" and information flows are free from physical constraints. Yet Hayles points out that information is "*always instantiated in a medium*". She argues that in cybernetic posthuman accounts, the body is no longer identified with the self; it becomes a universal object "for control and mastery rather than [...] an intrinsic part of the self" [7].

Defining the body as a universal object entails that it is "primarily, if not entirely, a linguistic and discursive construction" rather than a performative body. Therefore we must distinguish body from embodiment to understand how the linguistic domain has attempted to control the body. According to Hayles while body is constructed through normative assumptions that define a stable and normative set of criteria, "[...] embodiment is contextual, enmeshed within the specifics of place, time, physiology, and culture, which together compose enactment" [8]. Therefore, embodiment denies the possibility of reducing the subject to linguistic interpretations. In her defense of a posthumanist performativity, Karen Barad argues that "language has been granted too much power" and that "the only thing that doesn't seem to matter anymore is matter" [9].

Barad proposes a posthumanist notion of performativity that incorporates both "material and discursive, social and scientific, human and nonhuman, and natural and cultural factors" [10]. However, she argues that this is only possible if "agency is not aligned with human intentionality or subjectivity" [11]. Therefore, posthumanist performativity recognises that it is unfeasible (and possibly undesirable) to resist the impact of machines in our environment and our own bodies, while at the same time acknowledging the importance of embodiment (or body in context) against the linguistic and normative construction of the body. This is enabled by a posthuman subject that, in Hayles' words, constitutes "a dynamic partnership between humans and intelligent machines [that] replaces the liberal humanist subject's manifest destiny to dominate and control nature" [12].

DEFINING DIGITAL PERFORMANCE IN NETWORKED PUBLIC SPACES

Digital performances in networked public spaces foreground the embodied posthuman subject envisioned by Hayles. The term *digital performance* encompasses works where both embodiment and electronic flows converge. It also avoids the limitations of using categories such as locative media, or digital interactive installations, which suggest a focus on a specific (and stable) technology or infrastructure.

I employ the term *networked public spaces* to describe the convergence of (private and public) urban and electronic flows. Public space cannot be reduced to a fixed arena where the 'public sphere' is enacted in an orderly manner or— as many contemporary social studies suggest—portrayed as 'dead

space' [13]. Public space has always already been networked, however the advent of digital technologies has foregrounded and accelerated this process.

Mobile phones in particular have enabled embodied posthuman practices that support performativity in public spaces through its multiple capabilities: phone calls, SMS (short message service), mobile Internet and locative media applications. These have generated high hopes of a renaissance of the 'public sphere' and of public space, however these arguments remain speculative and largely untested.

The rise of locative media as "the next big thing" was accompanied, as Tuters and Varnelis point out, by practitioner's claims that "it can reconfigure our everyday life [...] by renewing our sense of place in the world". Yet at the same time, locative media has been criticised by many theorists for its apolitical nature and dependence on technology: while Andreas Broeckman accused it of being the "avant-garde of the 'society of control'", Coco Fusco argued that artists have substituted an "abstract connectedness for any real engagement with people in other places or even in their own locale" [14].

TOWARDS A PERFORMATIVE ACCOUNT OF THE POSTHUMAN SUBJECT

Such contradictory accounts highlight the importance of understanding embodied practices to situate the posthuman subject's experience in digital performances in networked public spaces. We must take into account: the subject's prior experiences of (networked) and everyday media practices through their own social and cultural contexts; the technologies involved, which are subject to failures and misunderstandings; and the unpredictability of the networked public space with its complex assemblages of bystanders, weather and mobility patterns, urban furniture, traffic flows and other participants.

A performative account of the posthuman subject in digital performance enables a non-linear narrative that "[articulates] the posthuman as a technical-cultural concept" and refutes metanarratives about "the transformation of the human into a disembodied posthuman" [15]. As Barad points out, performativity "[shifts] the focus from linguistic representations to discursive practices" [16]. This is evident in digital performances such as *A Machine To See With*: while it is based on a linear narrative with a clear chain of pre-scripted events, it is reshaped by the 'performance' of unpredictable assemblages of embodied practices.

The audience of such performances presents another complicating factor. While in traditional theatre plays (including the avant-garde performances of the Futurists), the audience was allocated a fixed area—and expected to react to the play through predictable patterns of engagement—in performances such as *A Machine To See With*, the audience is not only fully mobile, but performing the roles of both the actors and spectators. Therefore, despite the narrative being pre-scripted, it is impossible to predict participants' reactions. This challenges the understanding of these events and highlights the need for new methods of observation and analysis.

Barad suggests a shift in focus from representationalist understandings of events towards an active approach that reinforces the inseparable link between "observed object" and "agencies of observation", denying the possibility of a static or advantage point of observation. As the posthuman subject performs, the observer of such events must also 'perform'. In her view, discursive practices must *produce*—rather than simply *describe*—"the 'subjects' and 'objects' of knowledge practices" [17]. While Barad's framework proposes a posthumanist account that must be 'performed', it also questions the

human/nonhuman dichotomy and the privileging of human agency as the main trigger of events. A performative framework is particularly suited for understanding the embodied practices of the posthuman subject enabled by digital performances in networked public spaces.

In the following section, I discuss my attempt at performing observation during my field research on Blast Theory's digital performance *A Machine To See With* in Brighton during September 2011 towards an understanding of the posthuman subject's experience in digital performance in networked public spaces.

CASE STUDY: BLAST THEORY'S *A MACHINE TO SEE WITH*

"We needed to know whether you are a person who could step through a door and become someone completely different, and now we know. Your eyes are machines to see with and I am a machine to see with. This film is now yours. Is this the ending you want?" [18].

Participants are confronted with the quote above at the end of *A Machine To See With*, a digital performance by Blast Theory that reflects on our posthuman nature and the influence of machinic processes on our everyday lives. Blast Theory is an artist collaborative led by Matt Adams, Ju Row Farr and Nick Tandavanitj based in Brighton that has been creating innovative and challenging performances for the last twenty years. They describe their work as "explor[ing] interactivity and the social and political aspects of technology" and using "performance, installation, video, mobile and online technologies to ask questions about the ideologies present in the information that surrounds us" [19].

A Machine To See With invites participants to take part in a simulated bank heist that involves walking through public space while following pre-scripted instructions relayed by an automated phone system to their own mobile phones. Six participants start together following different routes that include a stopover in a public toilet (to answer questions given by the system while waiting inside a cubicle) and eventually converge onto the roof of a private (and usually busy) car park where they are told to enter a car. At this stage, one of the other participants is invited to join them in planning an attempted bank heist, which involves, among other things, betrayal, an aborted countdown, an escape route and a pledge to give money to a complete stranger.

While conducting field research on the event during its premiere in Brighton during September 2011 I attempted to employ a performative account of the posthuman subject participant by remaining close to the "observed object"—as Barad puts it—and using multiple and mobile points and methods of observation [20]. This approach involved: observing participants taking part in the event while making audio notes; taking pictures and videos of key moments; interviewing participants; taking part in the event myself; taking part in preliminary tests conducted by the artists; and attending project development meetings.

My performative observation of *A Machine To See With* highlighted the importance of embodied practices in reshaping the posthuman subject's experience of the event. Despite the linear narrative script of the automated phone system, the participant's experience was always unique and dependent on several unpredictable factors, such as the mobility of participants, their prior knowledge of Brighton, their interpretation of the messages received, the interference of bystanders, the surrounding urban space and the engagement of other participants.

For example, in one occasion a participant ended up in the wrong car park after failing to understand an instruction given by the system and decided to ask a bystander for help. While that might have been a frustrating event, he identified that moment as a highlight of his experience: while he hid for twenty minutes behind a bin in the wrong car park (the phone system told him to be discrete) waiting for a car that never turned up (which was stationed in the correct car park), he observed in the distance how the incoming sea fog (a nonhuman agent) gently enveloped a nearby building. He described it as the highlight of his experience—an event that was triggered by a failure in the relay of information.

The reality of the everyday life of Brighton constantly infiltrated the linearity of the pre-scripted narrative, challenging the perception and experience of participants: unexpected clouds of fog suddenly enveloping the car park; desperate bystanders knocking furiously on the public toilets' cubicles where participants were present; curious teenagers provoking participants as they exited the car; close calls with the passing traffic. Participants reacted very differently to these different experiences of embodiment. For example, while resorting to the escape route after the aborted countdown during the bank heist, some participants ran promptly, while others calmly walked away.

While employing a performative account allowed me to gain several insights into the experience of the posthuman subject taking part in the performance, it also highlighted the challenges of this approach: the difficulty of making notes and following the observed subject while moving through the public space of the city; identifying ideal points of view along the way while trying to remain 'invisible' to participants; dealing with the suspicion of bystanders; and losing track of late, absent or stealth participants.

CONCLUSION

A performative account of digital performances in networked public spaces enables a better understanding of the experience of the posthuman subject participant through the embodied practices that are triggered by assemblages of human and nonhuman agents. Such events are better understood through a methodological approach where observed object and agencies of observation are interlinked, and where embodiment plays an important role in both the participant's and the observer's experience.

Although employing a performative account exposes the observer to similar difficulties encountered by participants—which have to be dealt with dynamically—it allows for a dynamic approach that avoids the pitfalls of narrow descriptive accounts based on static or advantage points of observation and of assigning agency exclusively to individual agents.

A Machine To See With highlights the importance of embodiment in the posthuman subject's experience of digital performances in networked public spaces against a linguistic and normative construction of the body where information is privileged over matter, enabling emerging forms of embodied interactive practices and audience collaboration.

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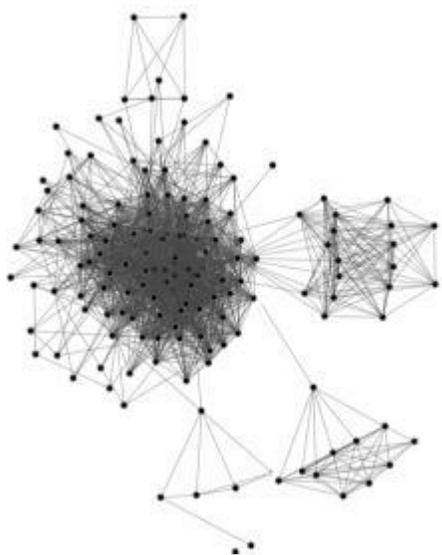
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WHERE IS MEXICO

JUAN JOSÉ DIAZ INFANTE

Brief introduction to the Latin American Forum. The term Latin American is a vacant concept and needs to be explored in a new way.



Sketch of a social network as a possible new configuration of a map.

What the United States does best is to understand itself. What it does worst is understand others.

_Carlos Fuentes, Mexican writer

Introduction to a Latin American Forum: why.

For thirty years, I have been working professionally as a troubleshooter, solving problems for companies and governments. Always very different type of problems ranging from conceptualizing federal elections to the introduction of new technologies. It is my experience that any problem most of the time is simpler than it seems. All you have to do is having the right diagnostic in your hand, it has to do with the possibility to "see". In many occasions professionals choose the most complicated process in order to justify the hiring of a big team to ensure a probable solution based on quantity and no quality. I am very sorry to say that most of the people have a solution before they know what the problem is about.

The issue that I try to explain today as a metaphore has to do with a name. It does not matter how much power or money you have, if you are a teacher or the president of a country, when you are calling someone by the wrong name, that person is never going to show up, you are never going to meet him or her, never going to get to know him or her. It is quite a problem that in the year 2011, we are still struggling with basic principles.

It is my experience that when you apply the equation of technology to a misunderstanding or the wrong message it only multiplies the confusion.

That is what I would like to speak today in the Latin American Forum ISEA2011. Going back to the basics, to get you attention to the term "Latin America". It is important that as time changes so do concepts.

I want to focus on the understanding of the difficult reality that this region lives. It is a paradox, between the complexity of thought that you can find there and the struggle to solve every day reality. Nanotechnologists with international science awards, Nobel Prize candidates that instead of struggling with the mysteries of a micro universe, they struggle to be able to walk in into their classroom in San Luis Potosí, Mexico. In this particular case two brilliant scientists, Mauricio and Humberto Terrones were asked to leave their jobs because they were invited to too many international conferences and the administrator in retaliation would not give them budget to put together their microscope for several years. They spent more energy convincing a very bad administrator than doing their research.

On the other hand, the outside view, it was historic when George Bush spoke one time to the people of Texas warning them how the Nicaraguans could invade the United States by foot. It is not bad enough that Bush believed that. It is incredible that the audience actually believed such statement. It is incredible that they elected him president and by default a World "leader".

In my travels around the World, it is very common for people to ask me questions like "where is Mexico" or to state things like "you are not Mexican", in most cases I gave no importance to statements like that, since I always would take them as an isolated accident. Nonetheless, lately, upon reflection, in the added experience of thirty years traveling through the World, I have come to realize that if we do not define basic terms we can not define complex terms. If the first step in a plan made of many steps is not clear the second step is a disaster and so on. Dialogue and communication can not take place if the very beginning is a false premise. Basic logic.

The Forum we are today is meant to have a clear strategy and a clear message on my behalf. I am trying to redefine a vacant term called "Latinoamerica", which is a term that defines a series of countries, but strange enough in each of the chosen criteria they never land the same countries. When you define Latin America as per its Latino language, you include places like Montreal or Quebec, but you leave out all the indigenous population and the original tribes in all the countries. If you define it as per historical parallel, places like Haiti or Montreal are out of the conversation.

This type of confused definition generates a problem of identity, in which the people within the parameters of the term do not believe or want to be part of the "wrong" definition.

For me the visualization of the paradigm is a map made of layers, semitransparent not geographically precise: knowledge before the Spaniards and the Portuguese, knowledge after independence, other broken knowledge later on, situated within a series of civil wars, government overtakings and revolutions.

To try to put a history of ideas becomes a gigantic puzzle, an incredibly fragmented reality in which each new government has an explanation of their own culture:

Examples at hand could be how Chavez came up with a law that makes it illegal to any citizen of Venezuela to be called Mickey; in other countries, like Argentina, Mauricio Kagel did a lot of his work outside or someone like Fernando Flores that had to leave Chile and had to live in San Francisco. Great knowledge buried among layers and layers of complicated political turmoil.

There is the need of for these 21 countries to become a region and there is a need of the understanding of Latin America as its true entity. Unfortunately, governments of the american continent insist in signing trade agreements instead of political agreements. There is the intent of focusing only in the economy, as to say if the economy is OK everything will be OK. It is also unfortunate that they have missed that mark, and the economy is not OK. Latin America is missing a component of social tissue needed to support the possibility of the creation of a region.

Latin America is a multilayered place of many fragmented realities, that needs complete understanding about itself to actually being able to discover its potential and all its possible expressions. The wealth is astounding, to mention very few but fundamental examples, the scientific knowledge of the Mayans having discovered the number zero (revolutionary at its time), the work in cybernetics done in Mexico and in Chile, the invention of the color TV by Camarena which also became the TV system that was used in the Voyager.

My statement on the nature of Latin America works in both directions, a message sent towards the outside and towards the inside. When talking to the outside, is to generate a second look, or a more accurate and a different look, a look that needs more attention to detail because is not organized in the same manner as other regions and other countries. Towards the inside has to do with the adoption of the definition not as an identity but as this "supra - identity". When countries are in a path of development you need to generate the tools or resources to become as strong as possible. The concept of a region has to do with generating new strength.

It is a moment of attitude, It is for us the artists of the region to redesign the metaphor, with any tool at hand, the tool of communications, language, social networks, technology, understanding the problem, generating new thought. We need new maps. Maybe in an era of social networks the new map is not anymore in the form of a globe but it is in a form of a social network. We need models that work.

This is the beginning of a job that has to be approached in a group consensus, through the constructions of networks of thought and a common language and agreed definitions. As in the paradigm of "GI-GO", Garbage in, Garbage out, if you feed garbage to a perfect model you get garbage, if you feed perfect data to a garbage model you get garbage... Clear understanding of our identity can yield out clear thought.

NEW GENERATION OF ROBIN HOODS: CULTURAL AND TECHNOLOGIC PIRACY

Ali Halit Diker

Who does culture and its products belong to? We are in a path society becomes more open, cultural resources are shared and distributed freely. But free as in free speech, not as in free beer as it is stated in Free Software Foundation's website.

"Property is theft!"

Pierre-Joseph Proudhon

COLLECTIVE CULTURAL PRODUCTION

Culture is produced and distributed by community itself without the need of any organization, corporation and any political entity through centuries. As Meral Özbek stated in her book "Popüler Kültür ve Orhan Gencebay Arabeski" this form of collective consciousness lies beneath what we call popular culture today. The best examples of this model of cultural production are minstrels and their master-apprentice relationships. It can be observed, some of the main facts in this type of production are that they are emerged against the pressure of power; they are traveled on the grapevine and become legends by passing through generations. Through this process of re-telling and re-production the original work is modified and is re-shaped with the period it is re-created. Thus there might be diverse versions of the same product.

One of the stories which is told in Turkish folkloric culture is Köroğlu whose fight against Bolu Bey became a legend and who became a symbol of fight for freedom. Another story which is more global - thanks to popular culture - is Robin Hood who is claimed that he lived during the reign of King of England, Richard Lion-Heart in Sherwood Forest. The known roots of the Robin Hood legend takes us back to 15th century. The most common version is the one that Robin Hood stands against the Nottingham sherrif who takes advantage the lack of power with the help of Hereford bishop while Richrd Lion-Heart was at war. Robin Hood is an outlaw who steals from the rich and gives to the poor, he is just and anti-clerical. He is commonly described that he comes from a social class called 'yeoman'. Yeoman class is more or less the same as today upper middle class. This class doesn't own a land but they're also not peasants. They are in the middle of both classes[1].

Robin Hood; he's a folk hero who fights for justice and freedom. The moral of the story is more or less about the equal and just distribution of resources. While doing this Robin Hood was marked as outlaw but it is only because of the paradigms defined by the holders of power. On the other hand, people needs this mythological hero. It seems normal that this story emerged during a period of oppression. There are two discourses in this analogy. One is about how the story is created and spread and the other is the moral of the story itself. Culture is a resource which has to be distributed just and equal to the society.

PRODUCTION OF MASS CULTURE

Actually this collective consciousness is not totally rejected but especially during last 30-40 years are about exploiting this collective consciousness with copyright laws and regulations[2]. Culture became an industry, a market and an area of commerce because of the capitalist system. Even though popular artists which are promoted as social heroes are puppets of big corporations. They become richer with intellectual property and copyright laws while they are also making the companies richer. The main problem is not that only companies benefit from these rights they are also becoming cultural monopolies. Intellectual property rights functions just for the sake of capitalists who are controlling information, technologic and artistic production. Another side effect of these property rights is academic development is also monopolized by corporations and corporate entities. The most of the academic institution are sponsored by companies and their research are formed by the companies' interest. The board of trustees of academies consist of legal entities, CEOs and corporate managers who simply controls local or global economies. This is a reminiscence of the Church's position during Middle -or Dark- Ages. The most important sources of knowledge were holy texts and they were not open to public. The only privileged people to exploits these texts was a small group of elites. As a matter of fact almost all of the middle and low class wasn't even literate so today's capital and economic power were in the hands of clerics and noble class like feudal lords. Maybe after the invention of printing press the distribution o these cultural resources became more democratized. Today, new technologies offer much more powerful medium than printing press. There are much wider opportunities for resistance and freedom with the internet. It is true that internet also became widely commercial but people are also discovering the alternate uses of this platform. In an era that culture is widely commercialized maybe it is best to use tactics such as Robin Hood's hit and run; small but effective.

COMMERCIALIZATION OF CULTURE / ACCULTURATION OF COMMERCIALISM

Today, multi-national corporations run most of the cultural entities such as museums and galleries and this is only a strategy to expand their customer profile[3]. And there is no such a thing as confidentiality nor cover. Maybe this is the transparency of evil Baudrillard mentions. Most of the investors of art or associates of galleries and museums specifies these investments are business strategies or backs up their other investments[4]. With these investments art market can survive through economic recessions[5].

Contemporary art works' conversion values are on stock markets. The most important art centers of the world are also capitals of finance such as New York, London, Dubai and Istanbul[6]. Capital's intervention and control of art does not include only art objects; like Stallabrass writes; it also includes the sales of images, sounds and words[7]. This creates a cycle of commercialization of cultrre and acculturation of commercialism.

POPULAR CULTURE AND HIGH CULTURE

Especially Andy Warhol and Damien Hirst are among the most popular names who are aware of this cycle. Non of them denies that art is business.

DISTRIBUTION AND CONVERSION VALUE OF POPULAR CULTURE

Popular culture products have specific conventions, adress a very large audience, simple, quickly consumed and do not need to much investment. They are more or less like replicas or cheap productions.

Still they have a quite large market and can benefit from intellectual property and copyright. Lately agreements like ACTA which are supported by RIAA and MPAA intervenes the distribution and even alteration of these products. Sometimes these intervention goes as far as the violation of privacy. Some of the planned precautions of ACTA might include limiting the blank CD and DVD production and even the installation of spyware to the blank CDs and DVDs to control the customers actions of sharing and distributing art works[8].

DISTRIBUTION AND CONVERSION VALUE OF HIGH CULTURE

High art, on the other hand is an illusion outside this realm but it also has its own conventions such as obscurity, boredom and lack of sentimentality and these; so called virtues creates its own market[9]. Corporations that invest in popular culture or high culture seems to do this because they want to address two different types of consumer. For example Fender -especially American Fenders- is a brand that is used by qualified musicians and sold at high prices. On the other hand, there's Squier which addresses to customers which has average or a little more than average income.

Maybe the only difference of high culture and popular culture consumption shows itself on the area of collecting. Even new media art has its price which is simply against its nature because they are easily reproducible. But again, the sales do not only include objects; it includes images, sound and words. Also an art piece owner does not only have higher social status because of his or her money but because of his art collection and taste.

SPONSORSHIPS AND MUSEUMS

The collections of museums or personal investors are exhibited by sponsors according to local or global economic and political conjuncture. Art seems that it is free but still it is oppressed by conventional apparatuses of power. Its controlled by visual and audial ideologies (It's another issue that if they even exist anymore).

INTELLECTUAL PROPERTY AND APPROPRIATION

Copyright was first established to protect the rights of creators of some books, paintings and maps, then its use expands quickly [10]. The exact point of its emergence is to protect the author but in time it includes alteration and publication and this enables companies and corporations to exploit artists and even its own employers with such contracts that gives them the right to any use and publication of the work or invention. So companies gain much more profit than the creator. One of the turning points of copyright history is AT&T's block to source codes of its software[11]. This causes trouble among computer scientist. Especially among academic researchers. Then Richard Stallman found Free Software Foundation because he did not have access the source code to improve his artificial intelligence project ,so he took the first step through Open Source movement and Creative Commons and Copyleft licenses[12].

Slowly but surely commercialized culture is blanced with these models. Cultural production and products seem to circulate more freely. In a society that culture is produced autonomous, it is produced not for the masses but by the masses, everybody is both the author and the hero of this Robin Hood legend.

THE WORK OF ART IN THE AGE OF DIGITAL REPRODUCTION

As photography emerged movements which are more expressive in painting, digital reproduction provided masses to explore new ways of production to express themselves. New mediums and new platforms -such as internet- provided alternative ways of sharing and distribution of products. According to Vaidhyanathan this model of production and distribution got human creativity closer to how it has always worked[13].

INTERNET AND CULTURE SHARING

Internet is one of the platforms that human sociability occurs the most. An average internet user might not be considered very conscious of this but it can be said that especially social networks triggers an intense sharing culture. This burst of sharing might be an unconscious or subconscious reaction to an enforced and controlled culture. Especially modified, remade or altered versions of some copyrighted products are essential among these shared reproductions.

RE-PRODUCTION AND DISTRIBUTION OF ARTWORK IN INTERNET ART

Actually the methods used in internet art works are substantially common in postmodern art.

One of the best examples that can be given for appropriation is Michael Mandiberg's *aftersherrielevine.com*. With downloadable high resolution pictures, their framing instructions and authenticity certificate everybody can have an image which has cultural value with has no or negligible financial value. The downloadable images are the one that Sherrie Levine photographed from Walker Evans' exhibition catalogue.

Another example is MTAA's *On Kawara Update*. The work imitates *On Kawara's* black on white oil painting which only have the date it was painted on internet browser. When you click on the date some Google Ads appear on the screen. The work both questions artist labor and it's connection with art market. What happens if a code does all the work? Another feature of the work is that its source code is licensed GNU General Public License and downloadable. So anyone who visits the site has the right to create its own version of this artwork.

Even though it might not be considered as internet art *The Droplift Project* is another interactive experience which attacks intellectual property rights in a Robin Hoodesque way. *Münyap* in Turkey and *RIAA* in the US are monopolies on copyrighted music. *The Droplift Project's* website there are more than 20 songs which are composed with the re-use of some copyrighted material like TV show and radio jingles, popular songs etc. They are downloadable and there's also a sticker for album, a front and a back cover with a barcode. You prepare your CD just like the ones sold in big music stores. You go put it in shelf and then wait it to be sold. It's not illegal according to the First Amendment and the Fair Use of the Copyright Act but still the artists can be sued by the copyright owners.

ALTERNATIVE LICENSING

Among this type of re-production, sharing and guerilla activities there are also alternative licenses such as Creative Commons and Copyleft which are widely used in arts and design. Open Source and Open Culture is becoming a part of societies daily part routine. Some articles on Wikipedia can be used as academic resources, Open Access Journalism provides transparent and objective news sources. These systems might create their own spaces of resistance against monopolies.

CULTURE PRODUCTION OF MASS

Slowly but surely commercialized culture is blanced with these models. Cultural production and products seem to circulate more freely. In a society that culture is produced autonomous, it is produced not for the masses but by the masses, everybody is both the author and the hero of this Robin Hood legend.

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SCIENCE, ART AND PHILOSOPHY: A REFLECTION ON A METHODOLOGICAL APPROACH TO INTERSEMIOTIC ANALYSIS OF INTERACTIVE INSTALLATIONS

Luiz Antonio Garcia Diniz & Adilson A. J. de Oliveira

We intend to analyze the construction processes of the Installation “*Um Novo Tempo – A New Time*”, created by the Research Group LABI, from the perspective of Yuri Lotman’s reflections on semiotics. Our approach is guided by reflexive relations that lie at the intersection of the concepts of Biosphere and Semiosphere.

Introduction

The vast field of reflection that the analysis of the semiotics of culture proposes allows us to think about cultural objects, in terms of both its immanence and transcendence. This means thinking about the relational forms that such objects have with the culture in general and, particularly, with the aspects of our construction or objective discursivity. In other words, we must discuss the relationship suggested by objects linked to cultural elements which constitute the external semiosphere (Lotman, 1999) and engendered by it, in particular with an eye toward its discursivity to understand the perspective of the Other singularized by the observer subject. Such subject will be defined here as a result of the relationship between the virtual and the actual, erasing boundaries that, as well define Peter Anders, places us in a cybrid environment. Cybridism, a socio-anthropomorphic phenomenon, is quite a clarification of the society in which we live.

Therefore, we have on one hand, the discursivity of the object itself conditioned by its internal laws; while on the other hand, we have the same object inserted into the cultural material of the semiosphere. And finally there is the observer, himself subject to contingencies that gave him the status of singular subject. It should be noted that the schema described above is part of another factor that we believe is important to remember: the link established between these three movements or moments, divergent of suggest stability or permanence of an instance to another, in fact, is made by continuous movement. What we found in an observer/reader interrelationship with the object seen, read and updated by him is a continuous maze of back-and-forth of elements distributed transversally, vertically and especially non-horizontally or linearly.

We will list, then, the elements proposed by the installation of the point of view of its physical structure to look more attentively at their construction procedures in terms of the meanings produced.

A NEW TIME: CONSTRUCTIVE ELEMENTS OF THE INSTALLATION

1-Tablet:

Component of the set below, the tablet, whose purpose is to record a message that is sent to the plans listed above.

2-Joystick device: spatial projection of deferred time

Past, present and future: the same phenomenon in three different perspectives. The interactor being filmed in three image planes: black and white, and red. The device consists of a webcam and a Joystick with five preset keys. Description of keys: access the recent past, access the longer past, access the present, accesses a possible future, change the angle of vision of the planes; Lever: Controls the time units in the second and third cases.

3-Touch Screen: whose choice of six videos shows a phenomenon in its temporality accelerated or extremely slow: the description of the physical phenomenon that occurs in the time interval of the phenomenon (mechanical, hydrostatic, biology). Videos shown: punch, drums, drumsticks, bladder filled with water, flower opening, etc....

4. Clock: aims to show the irreversibility of time. Advancing the clock clockwise, the interacting agent advances the time and, working it counter-clockwise, time is reversed (hair, egg, building falling and glass breaking).

5. Time Machine: temporality browsing media or historical times: Proposal for historicizing time, more specifically, the time in the media related to historical events.

SEMIOTIC SPACES

If we consider semiotic space as a place where semiosis occurs and, if we take as the object of analysis the interactive 'A New Time' installation built at the intersection and articulation of various languages as intersemiotic construction, or even grounded by the fact that these various media that carry distinct meanings produce various significations in their interrelations, and they are managed by the perspective of an interacting organizer, we could deduce that in an interactive installation such as the one proposed for our analysis there is an ensemble of several elements or sets of semiotic elements. However, in our view, it appears to be methodologically important to separate them for analytical purposes and then turn to the production of meaning that the relationships outlined above produce.

The semiotic space, which we will deal specifically with here, is the installation of 'A New Time'. It is necessary, however, to define that space taken up in its particularity in relation to semiosphere as Lotman defines it in his work 'The Semiosphere' (1999). The semiosphere finds conceptually a parallel in the biosphere, space in which all components are networked, making it impossible thus to isolate a single element without breaking the previous balance. It should be noted also the importance of the conceptual proposal to situate it synchronically and not diachronically.

We believe that all concepts involved in the installation go through two discursive instances: the thematic isotopy (abstract) and the figurated. The thematic precedes the figuration in its conception because it works with deeper levels of discourse. It's important to also note that without the passage to the figurative isotopy, we can't think of art, since it operates with consecutive passages of one to another. There were also switches necessary so that the discourse and its meanings are grasped by the enunciatory which, particularly in the object of our study is also the enunciator. The most globally enunciated built by the articulation of thematic and figuratively thematic isotopies only becomes intelligible when the sum of the meanings or interferences/actions added by the interactor participation becomes a constituent of the enunciation.

Exemplifying the way described above, in the installation 'A New Time', the isotopy theme — the plan of content, is made up of different approaches that suggest the concept of time, reversibility, irreversibility, literary time, and media time. The figurative isotopy is the result of the passage of thematic isotopy to the plan of expression; in other words, of constructs figuratized by the installation, for example, the videos about different times and the time machine as a metaphor for the temporality of historical time broadcast by the media.

We consider it important to note that on Lotman's trail of thought on a conceptual side of the semiosphere, it would not be possible to isolate cultural systems, since it comprises the whole of cultural production and the fact that its boundaries are constantly invaded, whether it deals with epistemological, linguistic or theoretical frontiers.

FROM THE SENSIBLE TO THE INTELLIGIBLE: OR HOW TO MAKE THE SIMULACRA – THE FIGURATIZATION OF A MEANS OF CONVEYING A SENSIBLE AND INTELLIGIBLE EXPERIENCE

Can we also consider the installations as simulators of voices that carry meaning? How do we reconcile the aesthesis experience by the induction method of scientific discourse? Or to the so-called scientific knowledge that such facilities are striving to achieve through their own methodology? These are questions to be designed to establish criteria ranging from the strategy of constructing indicative simulations of voices inherent to speech to scientific knowledge itself, narratively established in order to be disclosed to an audience that is not knowledgeable. Easing the transition proposal, that is, one that goes from the sensible to the intelligible is a function of strategy, or a set of strategies that the discursivity of the work proposes.

The installation 'A New Time' suggests the creation of a problem at the representative level interweave in the concept of time. Thus, it proposes a reflection on concepts such as the irreversibility of time, linear time and deferred time. It offers different looks at time or temporalities; thus we can infer from his narrative that the time from the point of view of physics it is different from, but not exclusive to, that which we learn in the more immediate term: we manage to grasp the idea of clock time, manage to place it in daily life but not in that of an action that happened a century ago, for example (unless through history and memory). Bergson (1974, pp. 268) considers that "the science of matter distinguishes a number as large as we would like for the range of moments in time that it considers. As small as intervals that are contained may be, [it] allows us to divide them further if we happened to need to do so." Since natural science always considers virtual time, stopped time is never real time, i.e., the time distinguished (*envisagé*) or as a flow. We would add still some aspects that define the present time in installation, such as literature, the arts and media.

We believe that a short digression fits here to clarify the point of view of the relationship between the three axis of our work located at the interface created by the relationship and links between art, science and philosophy. Therefore, we feel called upon to explain how we approach these forms of knowledge from the perspective of philosophy. To this end, the reflections of Deleuze and Guattari's work 'Qu'est-ce que la philosophie?' (1991) seem extremely important. The dimensions of knowledge, according to the authors, can be seen through the ways in which art, science and philosophy of the approach. The three means or dimensions of knowledge are specific, some as direct as others, and are distinguished by the nature of the plane and what occupies it. To think is therefore to think by concepts, by functions, or by feelings, and none of these thoughts can be considered better or worse than another, or as the au-

thor makes clear, none of them can be supposed to synthesize or express a thought more or less adequately than another. Another factor to consider is that every form of knowledge originates chaos, understood as a virtual space of possibilities. Chaos is not Nothing or absolute disorder, but rather a virtual in that it contains every possibility. Consequently, in the same way that chaos can give rise to forms and concepts, it dissolves them.

Thus, we consider that a see that non-order is processed into a form of knowledge. This form, or systematization of knowledge, provokes your insertion in one of the planes or dimensions mentioned above. Deleuze considers the event as the virtual reality, virtual updated. It is in this sense that the chaos or the virtual event and this allow for updating in the form of an organization of thought. Such an organization will determine the level of knowledge and the binding of the three dimensions that unfold. Basically, the question that pervades the thinking, the 'degree zero' of its birth, is the event [évènement], a phenomenon that gives it form and is processed in the space defined as chaos: virtual space in which the human agent seeks definitions an understanding of the events surrounding it in everyday life.

Therefore, in order to think of time not in linear terms but in its relationship with what was, what is and what will be, the installation proposes, through its enunciates a means of amplifying the concept of time in their simultaneity, i.e. present, past and future in terms of their interrelationships. Such statements seek to address many different readings, such as those quoted above.

DISCOURSE AND DE-COURSE

In accordance with Greimas and Landowski (1984), our approach is based on three forms of speech as typified in the social sciences and, in our case, we a hybrid discursive field, because its structure posits two distinct understandings, the first related to the creation, specifically for the electronic arts, and the second related to the scientific knowledge as stated in more general enunciation: speeches in search of scientific certainty; questions about the very meaning of research and interpretation of speech.

In the case of our subject, the second module seems more appropriate since the goal is closer to the discourse on the relationship between art, science and general statement, discourse of the unfolding of the installation itself: scientific dissemination through interactive installations. In other words, it would deal with interrogation of scientific and epistemological junction, located here as a discursive element of enunciates subjacent to the enunciation.

Defined in this way, the playing field of discourse as a question about the search itself, namely, a methodological reflection that brings together aesthetic and science, we aim to define in the same way the field of semiotics that would fit within an analysis of this type of discourse: the interactive installation driven by the 'mean to say', your 'to make', [vouloir-dire, faire] the intention of disseminating scientific knowledge. Thus, every object as constructed by cultural signs (paradigms) in relation to a context by discursivity as defined by the enunciation, the underlying enunciates are so articulated (syntagmatic relation) that they define, so to speak, the emphasis employed in this relationship as explained below.

PARADIGM, SYNTAGMA AND SYMBOL

Resorting to the idea that the concept of time found in our installation can be articulated and addressed in accordance with certain relationships around the concepts of paradigm, syntagma and symbol. Consider, broadly, that paradigm is the set of signs that we hold to prepare a syntagmatic relation or an utterance: an established relationship within the paradigmatic set of signs. As an example of this process, proffer as a possible schematization of the sign 'time' as part of a set of singular and different times. The result of that provision in a speech, taken here in the broadest sense, is what will determine our choice among the possible forms of syntagmatic relation. This process can be extended to any set of signs, such as pictorial, sonic, filmic, or in the relationships established between them, such as in the case of films, performances in which there are a relationship between sound and image, among others.

Thus, if we consider the settings of the discourse in the form of modules, namely, the symbolic, the paradigmatic and syntagmatic, we see that the latter focuses on semiotics, i.e. the relationship between signs and their semiosis. This does not, of course, exclude the constituent elements or the base to be used for the construction of the sentence, or, a little more explicitly, the isolated signs, taken alone under their paradigmatic form. That said; between the paradigmatic element used for the installation and its unfolding narrative, we can observe the paradigm 'time' distributed in at least four contextual relationships: the temporality media, the literary, cinematic, and that primary concept of the work, the temporality from the point of view of physics. Such enunciates within the enunciation define the meaning [vouloir-dire] of the work and lead the interactor to interlace his own narrative that will be added to the initial proposal and the enunciatory can to produce their own speech.

METHODOLOGICAL STRATEGIES IN THE INSTALLATION A NEW TIME

One way to divide semiotic groups themselves to the installation which we analyzed, was to separate them by blocks and start our analysis by clipping of the proposals suggested by the installation and defined by the five devices already listed. With respect to the plane of the utterance, there is an important variable which we have to mention: Although the object we analyze seeks through sensorial perception an analysis of scientific concepts, their proposed goal is an artistic product, and thus on the one hand, travels the field of the domains (scientific, artistic or philosophical) for the field of reflection on art, and on the other hand, the reflection is proposed specifically about electronic art, and further a field delimited, one which comes to electronic art designed as an interactive installation, i.e., a scenario that is requested from the enunciate a physical and cultural participation that the existence and work may have meaning.

Another reflexive field is that of scientific concepts proposed by the course of the installation. The poetry of images, sound setting, the language of the texts of writers, poets and scientists, serves as an anchor and metaphor and thus these productions collaborate in driving the manipulation of the enunciatory. Not being able to predict a pattern like the enunciatory advertising campaigns (target models, such as youth, children, classes), a way was conceived to fill the void of knowledge (potential space) intended to be attained (update) in the form of monitors (discursive simulacra of scientific knowledge) that amplify the voice of poetic speech and scientific understanding that are proposed aimed at the installation.

As a result, the concepts of irreversibility, reversibility, relativity and simultaneity are treated by the specificity of their constructs and by the means that the interacting might handle.

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PARTICIPATORY ART AS INNER CITY WORKSHOP: THE URBANREMIX SOUND PROJECT

Carl DiSalvo, Jason Freeman & Michael Nitsche

UrbanRemix is a collaborative and locative sound project designed to engage inner city communities with their neighborhoods through participation in a public art event. The project consists of mobile and web applications that allow participants to explore the acoustic identity of their communities as they record and remix sounds from their surroundings. This paper presents the concept and realization of the project in three different cities.



Urban Remix, 2010-11 Times Square project, map interface for sound mixing (left); Art on the Beltline project, Travis Thatcher live performance on location (right).

The UrbanRemix project builds on the idea of participatory art as a form of citizen involvement that engages people with their neighborhoods by encouraging citizens to re-discover their surroundings in a new way.

Participation has been discussed as a key quality of a range of contemporary artistic practices. As part of what Kester termed “dialogical art” it engages the audience, making their involvement an integral part of the artwork itself. “[A] dialogical aesthetic requires that we strive to acknowledge the specific identity of our interlocutors and conceive of them not simply as subjects on whose behalf we might act but as co-participants in the transformation of both self and society” (Kester 2004). Bourriaud differs in his approach to this kind of process-based art but comparable to Kester he stresses the “realm of human interaction and its social context, rather than the assertion of an independent and private symbolic space” (Bourriaud 1998). He identifies global urbanism as a driving motor as well as the stage on which the “growing urbanisation of the artistic experiment” (Bourriaud 1998) unfolds. UrbanRemix relates to this kind of participation and engages citizens in a new form of acoustic dialogue with their neighborhoods

and each other. It not only connects to the urban space thematically but also uses it as a source and stage for the artistic process itself. Sound recordings are gathered by local communities, shared via an open web site, and remixed online as well as in live performances staged in the neighborhoods where the sounds were recorded.

UrbanRemix is a platform that provides for participatory locative sound recording, mixing, and sharing. It consists of three key elements:

- a mobile application for capturing geo-tagged sounds
- an interactive online map for exploring and remixing sounds
- a range of outreach workshops and live performance events.

The UrbanRemix mobile application for Android and iOS allows participants to record sounds, take photos, tag them, review them, delete them, and upload them to a central server. Every sound recording is stored with its GPS coordinates, a timestamp, the ID of the recording person, and other customizable tags. Sound recordings are limited to 60 seconds and are uploaded as uncompressed audio files. Before they can use the application, participants first have to sign up on the UrbanRemix web site, where they agree to release their field recordings under a Creative Commons license. The application itself is available free of charge on the Android Market and the iTunes app store.

The web site (<http://urbanremix.gatech.edu/>) provides access to the uploaded media and allows participants to further tag the files, search them, and download them. The main interface to access the recordings, though, is an interactive map, built using the Google Web Toolkit. Recorded sounds are represented as markers on maps according to their GPS location. Users can filter the content of these maps for IDs, recording dates, or tags. Most importantly, they can click on the map itself to draw virtual paths through these locative recordings. Any path is then rendered as an audio soundscape mixing together the sounds closest to the path and changing their amplitude, panning, and filtering over time to reflect movement along the virtual path.

Participants are free to add more paths and can gradually build up an increasingly complex soundscape based on a multi-layered virtual traversal of the city. UrbanRemix allows further, more detailed sound manipulation as participants can loop and change rendering and mixing parameters in each path's settings. The result is an online mix based on the sounds recorded in the city and assembled with the help of spatial tracks crossing the city's map. Each mix can be saved, downloaded, and shared with other users. Finally, users can batch-download sounds to their DJ software and remix them locally on their computer.

The third element of UrbanRemix is a series of workshops and live performances. In practice, UrbanRemix comes to life in individual projects that center around communities and events at a certain place and time. Each project typically starts with workshops to inform groups in the neighborhood about UrbanRemix and encourage them to begin the collection of sounds and images. Discovering and selecting specific sounds for their own collection encourages participants to explore their neighborhood. It literally asks them to listen to their surroundings anew. Once the collection is complete, two forms of remixes are possible: online, using the web site; or offline, in the form of live performances. To prepare a public live performance, DJs download the collected sounds and perform live remixes using only the contributed content. All sound mixes, from DJs and other participants, can be shared and are found on the UrbanRemix site as well as other sound sharing sites.

A number of locative sound projects have addressed the use of locative media in urban neighborhoods. (see also (Freeman et al. TBP)). These include projects like Urban Tapestries (Proboscis 2004), [murmur], the Tactical Sound Garden Toolkit (Shepard 2007), Sonic City (Gaye, Maze, and Holmquist 2003), and the Silence of the Lands (Giaccardi, Eden, and Fischer 2006). UrbanRemix stands in the tradition of these projects and shares many comparable technologies and concepts such as maps, GPS, and locative

sounds. A key difference is, that UrbanRemix focuses throughout on a community aspect in the creation, mixing, and sharing of the evolving soundscapes. Sounds are gathered by local communities in their neighborhoods, shared and remixed online, but also presented back to participants in live performances delivered by professional DJs on location. The city becomes both a place for production as well as performance. UrbanRemix does not constitute an immediate intervention in the form of direct action but offers the chance to rediscover and reinterpret the spaces surrounding us.

Since summer 2010, we have conducted a number of projects with UrbanRemix that involved different audiences, cities, and neighborhoods. These include a project in the Tenderloin District in San Francisco, a project for the Atlanta Beltline project, and one at New York's Times Square. Various audiences have used the system, from High School students, to church community members, musicians, teachers, and media educators. Over time, UrbanRemix has proved to be flexible and portable and it has attracted some interest from artists and communities as an experimental platform for their own projects. In addition, UrbanRemix has been used as an educational tool in music classes during summer camps offered by the Atlanta Public Schools. The following paragraphs will focus on three projects in three different cities to discuss the project in more detail.

The Art on the Beltline project was part of a larger art program that addresses the multi-billion dollar redevelopment of the inner city of Atlanta. The art initiative is part of a 5-year plan developed by various communities and implemented in July 2006. As the development changes the city artists are invited to contribute projects that deal with the changing spaces and relate to what is marketed as "Atlanta's New Public Space." 270 artists contributed in 2010 and presented visual work, installations, and walks, as well as dining on the Beltline and musical performances on location.

As part of this program, UrbanRemix invited citizens to record sounds on the undeveloped locations before they will be reshaped by the upcoming development. The result is a form of acoustic virtual heritage that allows an audio-exploration of places whose character is bound to change rapidly in the near future. The final performance by DJ Travis Thatcher was held at a temporary stage on location at the Beltline on the border between the Old Fourth Ward neighborhood and Inman Park. The Old Fourth Ward is one of the oldest districts in Atlanta and has seen many changes in population and development. Today it houses the Martin Luther King Memorial site and is an example for gradual gentrification of inner city neighborhoods. Inman Park was Atlanta's first planned suburb and evolved into an expensive and largely historic neighborhood.

The biggest challenge during this project was to involve participants. Even though about 180 sounds were recorded, there were not many individual participants – possibly due to the way we announced the project as a "free for all" event instead of emphasizing more direct community involvement. The resulting sound collections might reflect a kind of virtual heritage or conservation of the location before the upcoming development, but they barely related to the socio-cultural conditions of the surrounding neighborhoods. This challenge of recruiting participants for the Beltline project informed our future work, making it clear that proactive solicitation of participation would be required. Still, even with limited participation, the outcome of this project is a collection of sounds that serves as a documentation of the acoustic identity of the space at one moment in the history of Atlanta.

A much closer collaboration with local communities was at the heart of the UrbanRemix project in San Francisco. The event was part of the City Centered Festival and hosted by the Glide Memorial Church. Originally founded in the 30s, the Glide Memorial Church developed into a thriving open community that actively supports often disenfranchised citizens of San Francisco. Since the 60s its program reaches out to a range of minorities in the city and offers housing, medical assistance, and educational programs. The surrounding Tenderloin district is a historic downtown area of San Francisco and a highly diverse neighborhood where inner city challenges such as crime and homelessness are found as well as historic buildings and thriving art communities.

Participants in the workshop included teen youth from the Glide arts program, instructors from that program, as well as interns and volunteers working at Glide for the summer. Over 170 sounds were recorded during the one-day workshop ranging from different voices in the neighborhood to detailed sounds, such as security keypads or traffic noise. During the project, a noticeable focus on recordings of voices emerged – as if the different citizens of the neighborhood were meant to find their way into the soundscape through their speech. Ken Ueno performed the public remix performance at a small gallery in the neighborhood. Because the project was part of a relatively short conference event, it faced a condensed schedule, which complicated the work of Ueno. He had only one day to familiarize himself with the recorded sounds for his live sound mix. While we managed to base the project better in the local community, the challenge remained to connect the process of remixing better to the chosen location. In large part this was due to the structure of the workshop, which emphasized sound collection over sound remixing. The lack of sound remixing after the project showed that we needed ongoing solicitation, even post-workshop events.

The UrbanRemix project at Times Square, New York was a collaboration with the Times Square Arts Alliance and combined the approaches tested before. Times Square is a renowned tourist attraction in New York, an extremely busy central hub that sees high traffic from both tourists and locals. The Times Square Arts Alliance regularly invites public art projects to Times Square. The goal is to let visitors encounter contemporary art and raise the profile of Times Square as a location. The invited projects include installations, projections, as well as live performances and are largely temporary pieces. UrbanRemix ran in April and May 2011, leaving the sound collection open for one month. The event was promoted online and through the Times Square Art Alliance on location to engage the audience. It also offered some prizes for the best online sound mix and the best sound recording to motivate participation. In addition, two workshops were held with students from the Jacqueline Onassis High School in immediate proximity to Times Square. A third workshop, co-organized by the New York media art collective Eyebeam, included local educators and media experts from museums, schools, and other institutions. Over 600 sounds were recorded and mixed by Thatcher and Damon Holzborn during a dual performance at the end of the project. They performed on a public outdoor stage in Times Square and in a second performance inside the visitor center nearby. The prize for the best online remix was won by a Brazilian artist, Osnilo Gesser Muller Junior, who had discovered the project online and had mixed his soundscape from his home in Brazil based on the recordings of the local participants. The prize for the best sound recording went to a local high school student. Thus, the project's outcome mirrors the double nature of Times Square as a lived neighborhood for its citizens, as well as a space of tourism and transit for a larger global audience.

No technical evaluation of user involvement has been conducted yet, but the informal feedback received in all three projects was largely positive. Participants often report new “finds” on their scavenger hunt for interesting sounds. This can be a discovery of something new in the all-too-familiar, like students discovering a fountain by “finding” the sound of water near Times Square in close proximity to their school, or it can be the documentation of a changing environment, as seen in the Art on the Beltline project.

Accordingly, participants showed clear signs of ownership of their contributed sounds throughout the projects. When they reviewed the sounds recorded for a specific project online, they often started with their own recordings, filtering out all other contributions on the web interface. At the same time, the live DJs were curious about the sound recording participants. Ueno stated after his performance in San Francisco that, “What I most wished to happen was to meet the people who collected the sounds and talk to them after my performance, which, unfortunately, didn't happen. I would have liked to have heard their impressions of what I did, and if they could recognize their contributions.” Different participants clearly engaged in the intended artistic musical dialogue “on” the location. This sense of shared ownership and personal connections was also visible in other UrbanRemix projects. In 2010 and 2011

UrbanRemix was used in music courses in summer camps with the Atlanta Public Schools. These camps allowed for a longer and more focused involvement. Students worked for approximately a week, recording and remixing sounds. Some students, however, not only created their own sound remixes but surprised us with their own dance routines based on their remix soundtrack. Reactions like these indicate that the engagement with their surroundings had clearly led to a new artistic dialogue.

Kester asked “How do we form collective or communal identities without scapegoating those who are excluded from them? Is it possible to develop a cross-cultural dialogue without sacrificing the unique identities of individual speakers?” (Kester 2005) Admittedly, not all boundaries for such a dialogue are eliminated in the case of UrbanRemix. Participation still depends on availability of relatively expensive smart phones, for example. Although we provide devices during the workshops, many other citizens remain excluded.

UrbanRemix succeeds in retaining the identity of individual participants within the sound collection and the evolving remixes. Participants not only pay special attention to their own sounds, but they also react whenever they identify “their” sound in somebody else’s remix. In that way, UrbanRemix provides an engaging platform for personal involvement with neighborhoods in a new sound-based dialogue.

Technically and conceptually UrbanRemix delivers a platform consisting of software, workshops, and on-line media. We constantly improve these core elements of the system, but to participants they appear as a “given” in any local project. Such a rigidity barely fits into the Dialogical Aesthetics outlined by Kester. It allows for a creative exploration of the surroundings, but only within the technical frame set by the underlying platform. On the one hand, this frees the participants to a playful involvement, on the other, it limits them to existent mechanics and restricts any alteration. For example, we do not teach how to change the code or hack the mobile application. In this regard, UrbanRemix constitutes a tool for artistic involvement that has an own rhetoric: what data is saved, who has access to the technology, what is the role of the administrator, how and where are projects publicized and conducted?

At the same time, each project is shaped by practical conditions depending on the participants but also on the conditions of the event, which include the scheduling of projects, availability of WiFi networks or electricity at the location. Even though they all used by-and-large the same underlying technical set up, each UrbanRemix project was unique. The system seems to encourage a ludic engagement that fosters a specific playful exploration of one’s neighborhood. This engagement should be seen as step toward Kester’s “cross-cultural dialogue” wherein performative and situated actions are integral part of the art piece.

Acknowledgements

We are thankful to all collaborators and partners in the individual projects. UrbanRemix is supported by a Google Research Award, Turner Broadcasting, the Intel Foundation, the Gvu Center at Georgia Tech, and the Georgia Tech Foundation. Additional project contributors include Stephen Garrett and Matt Gilbert. The project is available at <http://urbanremix.gatech.edu>.

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BIG GAMES AND HIPSTERS: COOL CAPITAL IN PERVASIVE GAMING FESTIVALS

DAN DIXON

Pervasive and street gamers are compared and contrasted with the infamous subculture known as 'hipsters,' showing that although they are quite different social groups their aesthetics operate in similar ways. Specific attention is given to the emergent, socially relative nature of these aesthetics and the operation of 'cool' cultural capital. These findings are based on ethnographic field-work carried out in 2010 at the *Come Out and Play* festival.

Pervasive games are new forms of playful experience that have emerged from the intersection between ubiquitous computing technologies and computer gaming. They are played in the physical world, away from desktop computers and gaming consoles; expanding game space into lived reality. However, as an unstable, emergent or avant-garde field the labels are still in flux. Street gaming is a term that tends to be applied to an evolutionary subset of pervasive games that chart a trajectory away from obvious technology, but still sit in a milieu of childhood video gaming, smart phones, internet access and the ubiquity of the web. These games have followed a design evolution that has removed unnecessary technology and focused on appropriative, energetic and playful uses of the city.

This paper is intended to show that there is a close relationship between the cultural capital of those involved in street games and the aesthetic appreciation of the experience of these games. Using hipsters as a curiously interlinked subculture, I point out that there are similarities between the way the two groups manipulate culture and meaning.

One reason for this approach is that formalist, or functional, interpretation of the rules, models and patterns of street games does not set them apart as they are often similar to traditional, large-scale, playground or wide games. However there are subtle layers of meaning that do create clear distinctions for those with the necessary cultural capital and make these street games mean much more to the players than just their mechanics.

In the July of 2010, I carried out an ethnographic study of the street gaming festival *Come Out and Play* in Brooklyn, New York. This was part of a longer investigation into pervasive gaming festivals that also occur in London, Berlin and Bristol. Established in 2006, *Come Out and Play* is the longest running festival of its type in the world; an annual, weekend event, with game designers and players coming from across the world.

During *Come Out and Play*, I closely followed *Gentrification: The Game*, which would eventually win the prize for "best use of technology" at the festival, and filmed a team of players for the full two hours of the game. *Gentrification* was designed and run by Atmosphere Industries – a group from Toronto – and is loosely based around *Monopoly*. In the game, multiple teams of players, playing as besuited developers or local residents, are pitted against each other to fight for or against the forces of gentrification. Physically racing up and down streets to photograph themselves in front of properties – the mechanic to purchase locations – they would then go on to strategically build things such coffee shops or community

centers. There is an obvious irony in the game as the name suggests, especially as the designers specifically play the game in neighborhoods that are undergoing, or have undergone gentrification.

As these games are played in busy streets, in amongst everyday life and the players are performing unexpected actions, for example handing out flowers, singing, marching, making speeches, they are constantly asked what it is they are doing. For any street game, this appears to be a difficult question. After a number of attempts at describing to various local residents, one *Gentrification* player, whilst interacting with a man outside a US veterans centre hastily shortened his description to, "It's a hipster game."

Another, quite atypical, player was a local resident with a thick Brooklyn accent who had lived in the area all her life. She had brought her teenage son to play, as he liked acting and games, and ended up joining in this game herself. When I asked how playing this game made her feel, she described how all the other players were much younger and very different from herself; and finally, "It makes me feel like Williamsburg on a Saturday night." Williamsburg being recognized as the international locus of hipsterdom. [1] She said it made her feel highly uncomfortable.

Finally, as even one of the designers says, in a newspaper interview about the game, "We're interested in hipsters. That's it in a nutshell." [2]

Although the designer's quote appears to be flippant, between the three of them they have hit on something deeper about the relationship between who the players are and their enjoyment of the game. There is a deep and relevant parallel between hipsters and the players of street games.

Hipster – One who possesses tastes, social attitudes, and opinions deemed cool by the cool. The Hipster walks among the masses in daily life but is not a part of them and shuns or reduces to kitsch anything held dear by the mainstream. [3]

Defining the contemporary hipster is no easy feat for a subculture that prides itself on individuality and Internet-accelerated trends. The term itself is highly contested and in fact, for hipsters, being called a 'hipster' is something of an insult. [4] The term 'Hipster' first appeared as a reference to first black sub-cultural figures in the 1940s and then white sub-cultural figures in the 1950s. [5] Current hipsters emerged between 1999 and 2003, coming out of a post-punk, post-grunge neo-bohemia that is driven by a late-capitalist milieu of the experience economy. Hipster seems to emerge out of a thwarted tradition of DIY, alternative youth subcultures that have been integrated, humiliated or destroyed; leading to hipsters being anti-political and consumerist, ultimately deploying mockery and irony to communicate apathy and disgust around local and global issues. Paralleling Mailer's 'white negro hipster,' which fetishized 1950s blackness, the 21st century hipster, "fetishizes the violence, instinctiveness and rebelliousness of lower-middle-class suburbia and low-class country whites." [6] Some keywords that define this set of looks and interests are: "Trucker hats; undershirts called wifebeaters worn as outwear; the aesthetic of basement rec-room pornography; flash-lit Polaroids; fake wood paneling; Pabst Blue Ribbon; porno or pedophile moustaches; aviator glasses; Americana T-shirts for church socials, et cetera; tube socks; the late albums of Johnny Cash; and tattoos." [7] A final approach to definition is that the hipster culture appreciates and uses an aesthetic based on tensions, ironies and radical alterations between knowingness and naïveté, adulthood and childhood, pretentious complexity and foolishness.

Although both the book and event that are *What Was The Hipster* [8] devolve into denigration and hipster-hate it is one of the few serious attempts to analyze hipsters. Although the book is not especially

academic in itself, as it is made up of reportage and press articles, Bourdieu emerges as the only serious academic reference that any of the authors resorts to. Repeatedly in the book's various chapters and cuttings hipster tastes and style are denigrated, and as Bourdieu points out, tastes and style are not purely aesthetic, but socially and politically determined. [9] Hipster-hate is a classic example of what he calls 'symbolic violence,' the unconscious modes of domination within everyday social habits. This relation between aesthetics, class, education and cultural capital is seen to be crucial in analyzing hipsters and is also crucial in understanding the emergence of street and urban games.

Combined with cultural capital, Bourdieu's concept of 'habitus' is important in understanding both hipsters, and it is important in understanding why digital hipsters play pervasive games. There are parallels in their worlds that emerge in their different practices across different fields. Habitus is an unconscious set of predispositions, tendencies and inclinations, not so much rule bound, but playing within regularities. [10] This is down to similarities in the structures of their habitus and the way they both mobilize the logics of their cultural capital.

In her ethnography of Williamsburg hipsters Ingrid Tolstad describes how this subculture creates and manages the intangible quality of 'cool,' [11] and equates it to Bourdieu's concept of cultural capital. The ability to amass 'cool' capital results from the hipster's middle class habitus, level of education – usually university level – and high level of disposable income – from jobs in the media and creative industries. As Tolstad says, 'cool' has value, but it is very contextually dependent and is constantly redefined by the members of the subculture. Thus making it difficult for people outside the subculture to appear 'cool' or understand what makes someone or something 'cool.'

Although, as Greif pointed out, there are some common markers of hipsterdom, [12] from within the community the logic of 'cool' and the signs of membership are highly nuanced. This concept of 'cool' is aesthetically presented through retro-referencing and intertextuality in fashion and design. Raiding the late 20th century, the ideal hipster will select a clothing style from one period, tattoos from another and follow obscure bands, resurrecting music from the past: constructing a personal text to be interpreted by other hipsters, becoming both authentic and different at the same time. [13] The ability to both construct this individualized personal image and read the personal images of others is highly dependent on the individual's habitus and the level of cultural capital obtained through university level education. The hipster is a highly mobile and highly influential group of people, whose trajectory might well follow similar paths to the ones Bourdieu mapped for fashion houses in France. [14]

Our native Brooklyn player considered herself out of place; she felt surrounded by different people and equated that sense of alienation with the same feeling as visiting the hipster areas of New York. None of the players or designers of these games truly think of themselves as hipsters, or belong to that subculture. In fact raising the idea with some designers has provoked the same kind of hipster-hate as that which appears in *What Was the Hipster*. [15] However there are parallels between these two groups that go beyond these comments. These groups share many structural and aesthetic similarities that make pervasive, street and urban gamers a form of digital, or gamer, hipster. They are certainly not typical hipsters, but many phenomena are typically hipster.

The classic hipster employment is in specialist retail and service jobs, or in the advertising, media and content industries. [16] [17] Through my ethnography, I have found that players in street gaming festivals tend to work in digital media, web design, game design and generally the more creative end of the ICT industry. There are however subtle, regional differences in the make up of the main street and pervasive gaming festivals. These reflect the social networks of the organizers and designers as well as the

industry focus of the cities where they happen. For example, *Come Out and Play* in New York had a higher concentration of game designers and developers due to the large 'indie game' design community in and around the city which the organizers are heavily involved in. *Hide and Seek* in London is skewed towards the digital media industry, which would also appear to match up with the background of the organizers and the high concentration of digital media in London. *You Are Go* in Berlin seems to have drawn in many artists, again due to the organizers and the large population of art, especially media art in that city.

Players and designers of pervasive games share similar upbringings to hipsters. They are almost universally from middle class backgrounds and have achieved at least an undergraduate education. There is a surprisingly high level of post-graduate education amongst players of street games, and also a high level of academic involvement.

So there are similarities in upbringing and education across these two groups, but obvious differences in the types of common employment. These groups are obviously not the same and there is certainly a split between hipsters and street game players. However, even though there is local variation across the many different cities and countries there is a commonality of players of street games. Broadly speaking they all tend to be involved in what might be called the experience economy, the set of business that orchestrate memorable events for their customers; more specifically, those that are based on the creative application of digital technologies. Although there are exceptions to this rule, there is a high degree of commonality.

There is also one key aspect of street game players' upbringing that is very important. Again, almost universally, they all grew up playing video games and to a lesser extent tabletop, board and role-playing games. There is an embodied capital in their access to the stories, symbolism, gameplay and shared experience of video games, especially what are now known as retro-games. Most of the players at these festivals range from the mid 20s to the late 30s, and the games they would have grown up with are from the early 80s to the early 90s. These eras of childhood gaming seem to hold a particular fondness for the players that goes beyond memories of childhood.

It is not just that they grew up gaming, as many from these generations did. Although not as distinct a concept as 'cool' for hipsters, street gamers also tend to attempt the same kind of authenticity, honesty and depth in their relationship to some other forms of gaming. Most of the players I encountered have a strong engagement with some form of non-mainstream gaming, for example the *Civilisation* series, retro-gaming, *Minecraft*, or German board games. This creates high levels of very specific forms of embodied cultural capital: a form of capital that functionally fills a similar space to that which the 'cool' capital does for hipsters.

The games at *Come Out and Play* ran the gamut from playful punning, such as *CounterSquirt* – a water pistol game with victory mechanics from the computer game *CounterStrike* – to loving attempts at live-action recreations of classic arcade games, such as a game of *Asteroids*, with 16 neon-tube wearing individuals acting as chaotic, bouncing, break-apart asteroids. These games are packed full of both visual symbolism, but also functional symbolism through their borrowed rules, interactions and back-stories. These digital hipsters 'get' street, urban and pervasive games through their gaming histories, and in the same way that Bourdieu describes habitus, they have a feel for the game. This differentiates them from those who casually encounter these games.

Just as hipsters have a set of tastes that comes from interpreting the aesthetics that emerge from manipulating 'cool' capital, and retro-referentiality, so do street game players. They create, and are the only ones that can truly appreciate, street games that are based on a deep level of referencing and reverence of games in general, and especially those from their collective childhood. In the same way hipsters mix the themes of child and adult, naïveté and knowingness, street and pervasive games tend to also mix childhood with adulthood. Games from their collective childhood are referenced, reused and remixed. As one interviewee put it, they are "children's games with something extra," referring to them being suitably challenging, complex and involving for adults

Returning to the game of *Gentrification* there are multiple layers of symbolism and ironies at work that extend beyond the game itself. There are oppositions and inversions between the child and the adult. It can be seen as a simplified, scaled up, child's game of monopoly to explore the very adult concerns of gentrification. It is simple enough to be played by those in the know but complex enough to alienate the locals. There are levels of irony, in that these digital hipsters are playing at symbolic gentrification in gentrified neighborhoods, but instead only follows the resident and developers who are caught up in the eddies from previous waves of colonizing artists and hipsters, both regular and digital. This is a hipster game on many levels.

Street games can be games that work within these inversions and contradictions because the community of players understand them. Not all games work with this and can be simplistic, but the best of them play off these properties and their tight network of reference to bring out experiences that are more than just the mechanics of the games. As both Lefebvre [18] and Debord [19] point out, these types of playful activity can engage in powerful dialectics with space and society.

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FACING PERCEPTUAL SHIFTS

MARGARET DOLINSKY

"Figuratively Speaking," a VR world, introduces Cubist figures from Dolinsky's paintings to a newfound dimensionality in virtuality where they establish both their personalities and the landscape. VR sets up a subversive confrontation by using a range of perceptual stimuli (visual, auditory, kinesthetic...) to exploit the artistic experience. Painting extends VR and the perceptual shift momentarily usurps reality.



Fig 1. Figuratively Speaking, © 2011 Margaret Dolinsky, VR World, Photo: Edward J. Dambik



Fig 2. Figuratively Speaking, © 2011 Margaret Dolinsky, VR World, Photo: Edward J. Dambik



Fig 3. Figuratively Speaking, © 2011 Margaret Dolinsky, gouache painting and 3D modeling are the inspiration for VR worlds

Introduction

The complexity of creating artwork for virtual reality theaters such as the CAVE Automatic Environment offers artists a multifarious palette that only begins with hardware and software. The aesthetics of an experience requires creating a plastic environment that ignites the imagination in order to inveigle the visitor and simultaneously engages the visitor. Virtual worlds immerse visitors with a range of perceptual stimuli (visual, auditory, kinesthetic...) that can be finessed through the artistic process. By setting up subversive confrontation between the visitors and the worlds in terms of such techniques as perspective, illusion and projections, a perceptual shift can occur that momentarily usurps ordinary reality. "Figuratively Speaking," a VR environment for the CAVE, is based on original watercolors of abstract figures whose faces, for the most part, are their bodies and concurrently compose the landscape. This deliberately confounds the environment to engage the visitor in a face-to-face dialogue with particularity and personality.

Facing perceptual shifts

There has been a historical tradition in art towards altering perception. My work in virtual environments employs dynamic imagery to heighten awareness, promoting what I call a "perceptual shift" for the visitor. A perceptual shift is the type of cognitive event of having experienced something extra-marginal, on the boundaries of normal awareness, outside of conditioned attenuation. [1] Perceptual shifts are often provoked by artwork such as *trompe l'oeil*, Cubism, Cornell boxes, labyrinth gardens, and Brecht's political theater. These devices for wonderment have a magical quality that requires a specific interaction unique to the particular device and its functions. Once the participant realizes his or her role within that interaction relationship, possibilities open for perceptual shifts and cognitive events. In my own work, I am not attempting to shape emotion in particular, but I do hope to shape perceptual possibilities within immersive environments.

Image making

I keep a sketchbook next to me at all times. It is especially critical in the morning. I reach for it before I am fully awake. I do not use an alarm clock, radio or other device. I avoid sounds and thoughts that define the day. I simply tell myself before I fall asleep what time I need to wake up. I sketch before I can articulate words, as if still captured in a dream state. It is during these hypnagogic moments that images form. Moreover, from the images, I recognize a sense of being. Rather than verbiage, motion becomes evocative, creating patterns of lines and shadows. The sketches come charging from the movements of my forearm that is channeling notations of memories and dreams that assemble themselves onto a surface. They are harbingers of narratives that temper and toughen consciousness and build gateways towards analogies. The sketchbooks are diaries, daily blogs in visual form.

Sketching impels me and inspires my paintings that inspire my virtual reality. At times, a sketch leaps forward, demanding further enhancement and calling to be fortified with color. I rarely understand the images before I paint them. I seem to know, without any calculated thought, which one needs attention. The process of applying color is seemingly ignited by an enticing song, as if sung by sirens. I execute the process of painting with mesmerizing fascination. I guide the brush to conspire with the surface. I counsel color onto a path where ultimately it is suspended from further voyage. The colors adhere to the plane, mixing with light, creating a surface, maintaining shape and decorum. As the culminations of my forces whip the brush's lashings into shape, the colors and shapes acquire integrity as entity. Color adds a dimensionality to the dreamt up image, provides a new parallel of existence, and extends my visual understanding of my process. Color establishes the robustness of the characters. It makes them whimsical, light-hearted yet at times, frightening.

The resultant image, a frozen structural moment finalized in time, becomes a world of contemplation that reorganizes itself as often as I look at it. The images begin to define a virtual environment and extend towards three dimensions. I create them anew in 3D computer modeling software. As the characters cultivate their relationships with one another, their prevailing forces energize to the real world and inculcate me with further ideas.

3D Virtual Worlds

The complexity of creating artwork for interactive stereoscopic cinema or virtual environments offers me a multifarious palette that only begins with hardware and software decisions. I consider my art images in terms of the connections they offer the visitor. The screens open to an infinite space that must be planned out as if it were real estate that is not necessarily grounded. The space offers multi-dimensional, gravity defying exploration with sensors triggering events. Illusion is presence. The 3D presence, completely illusory, is complex. It is visible through the light from the projectors coded in data. Each shape object model geographically maps the xyz Cartesian coordinate system and articulates a corresponding texture that maps the UVW components. They are co-located in the environment set with sensors for interaction. The hardware and software limitation mandates each facet of the artistic development with its own parameters and criterions. I must be vigilant. I am here for the experience dictated by my sketches.

Aesthetics of experience

The aesthetics of a real time animation experience ignites my imagination. I inveigle the visitor first through brightly colored and odd shapes depicted from my paintings. These shapes simultaneously engage the visitor, as they comprise the unusual characters to meet. Stepping into my real time interactive animation, the world is filled with the sights and sounds from my imagination. The environment navigates between my externalized imagery and my internalized thoughts. Small areas of the environment are confined to intensive interaction. The free navigation is halted by specific objects that manipulate sound. The juxtaposition of these events allows for free roaming thoughts with intermittent deliberations and activity.

Visual Perception

Virtual worlds are privileged by visual imagery. In "Figuratively Speaking," the original paintings dictate the aesthetic that guides the visitors through the experience. The paintings establish a 2D visual aesthetic that is extended to become a 3D space. The responsiveness of the visitors is encouraged through a range of perceptual stimuli including visual components, auditory design, and attention to kinesthetic movement. Rudolf Arnheim explains, "Visual perception is visual thinking... No thought processes seem to exist that cannot be found to operate, at least in principle, in perception."^[ii] The unique visual milieu energizes the experience. In order to navigate, one must identify the seemingly unusual imagery and make connections with it. In order to make sense of it and to make decisions, one suspends disbelief and interacts with art.

I design characters that look like heads. 3D allows them to move awkwardly, stare gracelessly and speak gawkily. They are simultaneously amusing and frightening. It allows me to establish an interactive relationship with a world I would otherwise only know in 2D (on paper and computer screens). I know the characters multi-dimensionally as a manifestation in 3D graphics or in rapid prototyping. I feel privileged to be able to extend the characters' conversation with me to others. I carefully place them to facilitate way-finding by creating visual choices or preferences for the visitor. The characters peak the visitors' interest and determine their next movements. I ignite attention through shape, size, color and brightness of the spatial configuration with the other objects that comprise the environment. This active selection and visual thinking creates a formula to design visual drama in the environment. Instead of drop down menus or folders with names on them, the objects are the way to navigating understanding.

The abstract imagery is reminiscent of the likes of Chagall, Klee and Picasso's cubism. The bright abstract shapes direct the visitor to explore particular paths. The fundamental elements of the imagery such as size, color, shape, and brightness can attract or detract the visitor to and from a route. These elements influence how the visitors' body moves along the path as well. At one point, all movement has to stop while at another it is slow in order to see what is unfolding nearby and in another, one cannot move fast enough to catch up with the moving objects, such as the boats in the water. My environmental design causes visitors to move to the side, lurch, and crouch and bend in order to anticipate a movement, face a situation or provoke events.

The visitors are also enveloped through the use of sound. The world is enhanced by sound that lifts visitors and carries them through the experience. The background audio is an ambient sound composition by Michael Drews and performed by the band, Big Robot.^[iii] The foreground sounds, heard when the events are triggered are composed by sound artist Rachel Weaver.^[iv] As visitors are listening, sound indicates where attention should be focused. Sound peaks thoughts and manipulates emotions. Sound provides context through acoustics and psychoacoustics. The malleability of the environment relies on the influence audio creates. Begault describes 3D sound systems as having four acoustic simulations: representation, replication, transmutation and creation.^[v] Creation is a completely unknown auditory

experience. This fourth simulation, creation, is what I find effective for my abstract environments to enliven the mood and engage the visitor in a theatrical art performance.

The design of audio, imagery and kinesthetics work in tandem to create a higher degree of temporal resolution and enhance the channel of communication between the visitors and the art.

Perceptual shifts

I construct pointers to perceptual shifts as the formal structure in my virtual worlds. I aim to capture those perceptual moments that are often lost because they are extra-marginal, outside the bounds of ordinary awareness. These moments are significant when they are initially recognized and lead the way towards integration of one with the surround. The environment must affect the visitor. Each visual element, auditory cue and kinesthetic activity represents a moment of recognition. These elements may act as a doorway, stairwell or tunnel that requires investigation. I establish the possibility for narrative by transforming the structure and architecture of the space into a series of visual and metaphorical guides for the participant. The environment is the navigational structure that ignites perceptual shifts and indicates the possibilities for interaction and, in turn, guides the overall experience.

The perceptual shift is established in terms of cognition, emotion and kinesthetics. The figures build a dynamic visual vocabulary. Combined with the awareness of time, the worlds are moving paintings. The visitors stand in the perceptual foundation of paintings that manifest experiential space. What is significant about creating virtual worlds is that it is the first redefinition of perspective since the Renaissance.^[vi] I extend this mathematical perspective with a perceptual shift in dynamics that allows visitors to face an unknown and synthesize to their present sense of knowing.

Figuratively Speaking

“Figuratively Speaking” is a virtual environment that establishes a ritualistic interaction of recognition, listening and attending. It is inspired from a series of hynagogic paintings. The paintings feature portraits that are simultaneously faces and figurative characters. The composition of the painting is in a six-panel grid formation. The painting allows the eyes to navigate the images in a sequential fashion, much like abstract comics. The virtual environment allows the body to navigate in a nonlinear fashion, similar to a stream of consciousness movement. The portraits provides affordances for the VR environment to establish methods for way finding.^[vii] The faces are portraits, figures and landscape elements.

Some of the perceptual context of this work looks at the research of Reber et al who suggest that aesthetic experience is a function the perceiver's processing dynamics. "The more fluently the perceiver can process an object, the more positive is his or her aesthetic response... Finally, the impact of fluency is moderated by expectation and attribution."^[viii] The experience of searching is governed by the aesthetics and the emotional tones of the faces/figures. Together, context and conceptualism, evokes exploration, recognition and discovery. The face is a metaphor for identity. The face represents a kind of knowing the self, determining where one is in relation to the other. The face also represents a kind of knowing of the other, determining where one is in relation to place and path. The face is also body and parts of the body makes up the landscape. Therefore, the face is also the grounding force. The visitor is immersed in a subversive confrontation with face and identification. This deliberately confounds the environment to engage the visitor in a face-to-face dialogue with particularity and personality. While navigating, the visitor constructs a narrative and the visual conversation moves between the artist, the visitor, and the artwork.^[ix]

Conclusion

My virtual environments seek to create perceptual shifts by setting up subversive confrontations between the visitors and the world. Visual design techniques for virtual environments such as perspective, illusion and projections are only the beginning of creating experience. My worlds are inspired by abstract drawings that are painted and reconfigured in 3D. In "Figuratively Speaking" the adventure is established through the use of abstract portraiture. The visitor must reckon the moment by coming face to face with her reality.

The forces from the paintings will inseminate a virtual world where the objective is that over time and by navigating through space, visitors produce their own momentary narratives, similar to my recognitions of my own perceptual shifts. The visitor navigates, explores and contemplates the environment, as if they too can recognize an extra-marginal moment in time.

"Figuratively Speaking" is an artwork that realizes 2D painting as the foundation for a virtual environment aesthetic. The vibrant colors and unique forms energy the environment and illustrate the dynamic playfulness of relationships between faces and characters, real and virtual. The change in scale and repetition of forms encourage exploration of the figures as both characters and as landscape. Beyond mere viewing of a frozen image, visitors can move and explore towards an aesthetic experience.

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ART AND LIFE: BIOCYBRID SYSTEMS AND THE REENGINEERING OF REALITY

Diana Domingues, Adson Ferreira da Rocha & Cristiano Jacques Miosso

Ontological levels of creative reality and the reengineering of life provided by the BWAS– biocybrid wearable affective systems – configure the expanded sensorium and the health measures against the infirmity of landscapes, in biodiversity. Art and Technoscience combine developments in biomedical engineering in physiology and synaesthesia into the drama of life and the embodiments in Brazilian cultural rituals, urban space, domotics and ecology.



Figure 1. (a) The four stages in the development of the system for the classification of frogs' vocalizations. (b) A large screen for the manipulation of visual and sonic information.

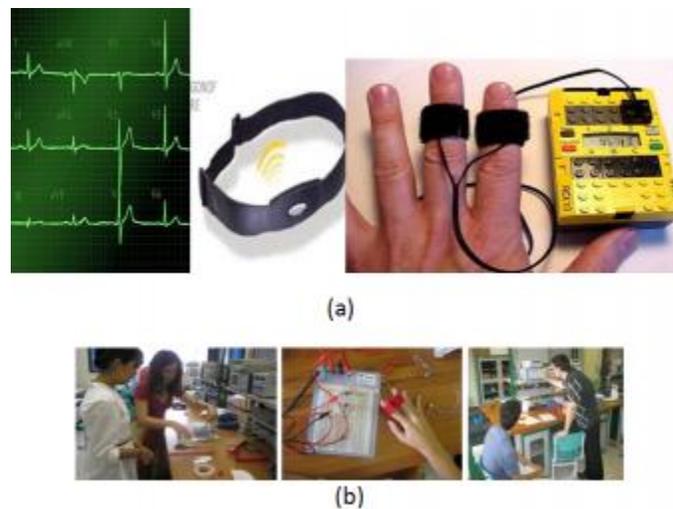


Figure 2. (a) Circuit sensors for the biocybrid condition. (b) Laboratory of instrumentation, where we develop the biosensor circuits. BWAS mobile wireless using non-invasive sensors for the body capture electrophysiological signals - galvanic skin resistance, breathing rates and heartbeats, which are treated and transmitted.



Figure 3. Traditional figures of Baianas (the old mother), in a Carnival dance, performed at Rio de Janeiro streets. Image provided by Maria Aparecida Donato, a post-doc researcher at LART.

1. Introduction - Biocybrid systems and the drama of life

Challenges of the world, increasingly technologically dependent, are faced by our biocybrid circuits of sensors, blurring the limits of the natural worlds and the engineered reality. Creative technological levels regarding body, landscape and the urban life of our biocybrid systems are provoking the end of the “nature itself” and the emergence and “the future engineered reality”. The Group of researchers at UnB Gama in the Biomedical Engineering Graduate Program and in the Laboratory of Research in Art and TechnoSciences – LART develops biocybrid systems for human existence in the continuum and symbiotic zone between body and flesh - cyberspace and data - and the hybrid properties of physical world. That continuum generates a biocybrid zone (Bio+cyber+hybrid). [1] We add biofeedback circuits of sensors, therefore, bio signals to the cybrid condition, pointed out by Anders in 1998, [2] and we investigate complex enactive systems of creative technologies which reinforce the *natural* history of artifacts, with cyber technologies and transparent interfaces ubiquitously mixed to phenomena of ecoscosmos life.

Biocybrid condition is the co-existence in the physical and cyber worlds connected by enactive interfaces allowing biosignals communication and affordances in the “narratives of life”. Anthropologically, we propose the affective wearable condition, resembling Picard’s investigation on affective computing. [3] We reinforce the liveness condition and the reengineering of our sense to be alive in every act through our biological signals. This approach is not new; we only gain creative levels for the understanding of our relationship human/environment in the remote theory of enactment, as in Aristotle's *Poetics*. [5] Enactive interfaces embodiments reinvent the drama of life by Aristotle and life is a complex act of being enacted to the environment by biosensors.

1.1. THE AFFECTIVE AESTHETICS

The body as part of an interactive system evokes the expansion of the aesthetic dimension in conceptual and body art with responses generated in symbiotic zones with programs within “hermeneutic operations,” dealing with biophysical laws, when code and facts are experienced in the intensity of the senses and the ability of data laws built into the system. In the field of *endophysics*, [4] Rössler’s interfaciology points out what the Performative Science is.

Reaffirming the origins of the discipline *Aesthetica*, postulated by the German philosopher *Baungartner* in 1750, we propose embedded systems for synaesthetic experiences of biosynthetic bodies and the ability to perceive the world with the five bodily senses. Physiology and synaesthesia are the main topics for our microcircuits.

Biosynthetic interfaces integrating biocybrid systems are no longer machines, but complex systems, surpassing the human condition and limits of the mechanistic paradigm. We must delete this old classification and consider human/animals/environment as a complex, living organism. In 1997, we had already discussed, in the *Flesh Factor* list of Arts Electronica Memesis Symposia, [5] some theoretical aspects related to this development.

In the 1990s we started to postulate the interest of sciences on the human factor of technologies, increasingly growing to the spiritualism of their theoretical approach. We now propose the biosynthetic interfaces expanded to *biocybrid* systems and ecstasy. But in the earlier form, we had already started postulating the trance. Our projects described in Section 3 analyze rituals in the passage from trance to ecstasy. We consider the “sentences” of the body movements, called *parakinemas*, which come to existence due to stimuli, whose basic components appear also in the Brazilian culture’s rituals and myths.

In a general way, the point is to consider the myths and old ontologies close to the biocybrid systems, the reengineering of sensorium and the reengineering of nature.

2. Reengineering Nature – Biodiversity, Infirmity and Affectivity

Assuming the role pointed out by Louis Bec, we are engaged extremophiles, [7] working in the direction of a cultural and anthropological paradigm, and concerned with the planet’s health. In the same way of ontological levels of creative reality and mutual influences with environment information related to the James Gibson’s ecological perception theory (1986), [6] we investigate the ecosystem in its dynamical relations between human, animal, plants and landscapes.

The urgent attention to life in our country’s huge territory calls for the extremophile creative attitude, facing the effects of an endemic infection of tropical climates as well as the challenges of the biomes in the Amazon Forest. We consider the infirmity of the territory and the human invasion and destruction of the ecosystem self-organizing defense.

We will describe two of the types of research we conduct: *Sapio – biodiversity, infirmity and affective geography* (Dengue infirmity and health care) and *Frogs’ signatures: Pantanal Bioma in Amazonia Forest* (preservation of ecosystem and biological community).

2.1. SAPIO: BIODIVERSITY, INFIRMITY AND AFFECTIVE ECOSYSTEM

The System for the Acquisition and Processing of *Ovitrampas* Images (SAPIO) develops an automated tool for monitoring, fighting, and preventing *dengue* in creative extremophile actions regarding a human/environment/net, natural/artificial, remote/local and rural/urban structure in mutual contamination. Dengue ecological information analogous to the principle of the ouroboros mythic serpent, and self-regenerating emergent narratives about health care and dengue. Interfaces localize the *ovitrampas*,

special traps that collect the mosquito's eggs and reveal infestation tendencies allowing the prompt definition of control actions. The SAPIO project is aimed at obtaining and analyzing ovitrampas images, in order to automatically count the deposited eggs and to disseminate the collected information through the World Wide Web.

2.2. AFFECTIVE GEOGRAPHIES: INFIRMITY OF THE LANDSCAPES AND NEW ABSTRACTIONISM

Our Biocybrid cultural platform mixes people's life and behaviors to the natural physical environment, by using data collected mainly data from geography (GPS, Google Maps) and SIG regarding the infirmity of the landscapes. The processes are fundamentally different from photography and television used in Brazil, using tools such as data visualization, scientific methods of signal processing, web semantic and visualization of social nets, augmented reality and mobile devices using APIs for Google maps, Google earth, SMS, Blogs and Wiki Maps. Learning and teaching about the epidemic mixes experiences in the physical world and in the digital environment, with collaborations and reciprocity. The co-location in the virtual and physical environments makes virtual worlds reengineering physical world. They share the responsibility and affection to the landscape, meanwhile the Art History, in the domain of the new abstractionism is enhanced by signals processing, data visualization, satellites eyes, computer vision, and other synthetic systems. The CyberAdams and health care reengineer reality.

2.3. FROGS' SIGNATURES IN THE PANTANAL BIOME

In another line of research, we investigate the frogs' populations in the *Brazilian Pantanal* area, and explore the richness of information in the frogs' vocalizations. This sonic landscapes theme is the research focus of the PhD student André de Oliveira, enhanced by our investigations on data visualization and signal processing. The data visualization and sonification system in voice recognition and intelligent methods to analyze the properties extracted from the frogs in Pantanal Bioma are summarized in Figure 1 (a). The automatic system will provide to the biologists the classification of species and the number of frogs living in that remote bioma which will replace the old and analogic ones.

In developing the biocybrid system and the simulation of the human proximity using wearable art and biosensors to act and actualize, by immersive synthetic biofeedback interfaces the data landscape – large data screen or cave, exemplified in Figure 1 (b) – and the manipulation of visual and sonic information, in dialogues with the distant *Pantanal* Biome. Metaphorically, we propose the frogs' signatures and the human behavior dealing with laws and phenomena of the cosmos, by influencing life of nature inside the world as a living organism exchanging electrical potentials, heats, sounds and vibrations and the sense of presence being advanced by the technological apparatus and affective biofeedback for the responsibility of humans and a healthier territory.

3. Reengineering Senses – Biocybrid Systems and Expanded Sensorium

We develop microcircuits with sensors for the creative levels of performance and *coinaesthesia* – all the sense, to reaffirm the potential of affective aesthetics. Manufactured synthetic senses for enactions and synaesthesia [9] as filters for translating the intertwining of the body with the technological environment configure that perception as a laboratory phenomenon, as Krueger described in his "Redefining

Human". Microcircuits of wearable biosensors referenced in Maturana and Varela consider the interactions with the environment as sources of percepts, rather than mere representations and the body is involved in a neuropsychophysiological way, with mutual interactions with the whole environment. [8] Physiology and synaesthesia are the two topics for biofeedback

3.1. SYNTHETIC SENSORS AND THE OUROBORUS PERCEPTION: THE SEAMLESS AND ENDLESS AFFECTIVITY

The endless ouroboric principle of life, by Domingues, [2] with the mythic serpent eating its own tail and self-regenerating life, is expanded in wearable affective biocybrid systems. We invest in technological innovation regarding the miniaturization of hardware systems that have enabled the development of network sensor nodes, for interconnected wireless networks and assistive medical applications. According to Rocha, [11] these sensors have the ability to detect or measure some phenomenon of nature, processing and transmitting data or information to other sensors. In our artwork the circuit is built in an intelligent network inserted in a set of accessories, which coupled to bodies configure the Biocybrid Wearable Art System (BWAS), exemplified in Figure 2(a).

3.2. THE PERIPHERAL PERCEPTION: EXTRUSION OF EYES AND COUPLED VISION

What is vision now?

The recent anthropological biocybrid mobile condition amplifies the phenomenology of "being here" (Barthes), altered by the use of mob cameras of cell phones, and the locative and geographic interfaces. We perceive with three eyes, and no more only coupled to the mechanical eye of the photographic camera. In January 2011, we discussed, in the SPIE conference, *virtual reality reengineering reality* session [1] and the inclusion of synthetic objects in physical concrete spaces by mixed and augmented reality and computer vision. The system reaffirms the post biological extrusion of human vision, by the act of seeing shared with the satellite eye in the sky and the handled eye of the mobile device, expanding the human perception. Tags in AR placed in a GPS (Global Positioning System) and the possibility of geodesic coordinates create a co-located event for human body. The neuropsychophysiological perception expanded by data signals processing, geotags and computer vision allows interventions in urban life, using mobile augmented reality (MAR). The ecological geolocated art event *Borges Fantastic Creatures in Buenos Aires' streets* insert Synthetic creatures in the city.). The earlier *14 Bis* biocybrid system, celebrated Brasilia's 50th birthday, in a public event where the plane, invented by the pioneer Santos Dumont invaded the sky. In the Domotics field, we use the BWAS in connection to a specific environment (home, office, hospital or other), and the relations between the inhabitants and the space, as well inhabitants, patients and doctors etc.. Regarding biomedical applications, the relationship of distance between individuals is a relevant factor in the recovery of some diseases. The certain distance from other people or objects, and the invisible bubble of space which is the "territory" is one of the major dimensions of modern society are the approaches to LART PhD student Tiago Franklin Lucena in his Project *Cidadepathia*.

3.3. TRANSPHYSIOLOGY OF PASSIONS: EXTREMITIES OF THE BIOCYBRID CONDITION AND RITUALS: FROM TRANCE TO ECSTASY

In the same attitude of creative extremophiles, we focus on the expanded sensorium in data visualization and biosignals, reconnecting the body and its physiology to the rituals. The concept and operational

principles: 1) the body's schemas based on Rudolf Laban's corporeal graphics or Labanotations; and (2) kinesthesia, always perceiving and processing data of human physiology and affective levels in scientific analyses of electric potentials and biofeedback using the BWAS. The kinesthetic Labanotation schema enhanced by the data visualization methods, in sensorial properties of synaesthetic biofeedback provide us the kinetography mixing the Kinemas, as a language of movement in a transphysiological dimension. Aspects of motion, electricity, graphic design, in data visualization and data sonification: body movements, translating graphics, gestures, postures, fragmentation, reinstatements, dynamics, internal-external connections and motor schemes, dealing with gestures, rhythms, not only at each stage of the movement, but also in consideration of what affects you, the environment and the coupled interior and affection in the flows of life with affective wearable sensors. The resulting concept fundamentals the transphysiology of the Ecstasy is rooted in the concept of the Transphysiology of Passions and Trance, proposed by the supervisor of this research, Diana Domingues and discussed in the post doctoral research by Donato Cida / CNPq. The body's electrical potentials rising from ecstasy in Brazilian rituals such as the carnival and Afro-Brazilian religions as Candomblé and the shamanic trance differs of the ecstasy states. In the ceremonies that involve embodiments in deep levels of unconsciousness, the ecstasy and their sensations, emotions and thoughts, attempt the condition of transcendence, embedded in mediunic state. The internal excitations of the nerves and sensorial apparatus caused by the impression of the senses are translated in its transphysiology, where the sensorial and affective presence is measured. Laban's paradigm postulate that human movements are always composed of the same elements, whether in art, at work, rituals than in everyday life. Consequently, we search for a method with emphasis on the psychological and physiological aspects that lead human beings and electrical biopotential of a body, which in their combination produce states, qualities, actions and parallel motion feature psychic actions present in our actions – recognition in the form of rhythms and structures – the *poiesis* of a bio-cyber body.

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ART AND THE EMERGENT IMAGINATION IN AVATAR-MEDIATED ONLINE SPACE

DENISE DOYLE

This paper presents a framework for what is termed 'the emergent imagination' (developed through a recent PhD thesis) that arises out of the transitional spaces created in avatar-mediated online space; and argues that the conditions for 'the emergent imagination' are best generated where the experience of space is heterogeneous and where the plasticity of time-space relationships is articulated.



Figure 1. *Wanderingfictions Story* as part of the *Meta-Dreamer* project at the Golden Thread Gallery, Belfast (2009) Digital Object. © Denise Doyle

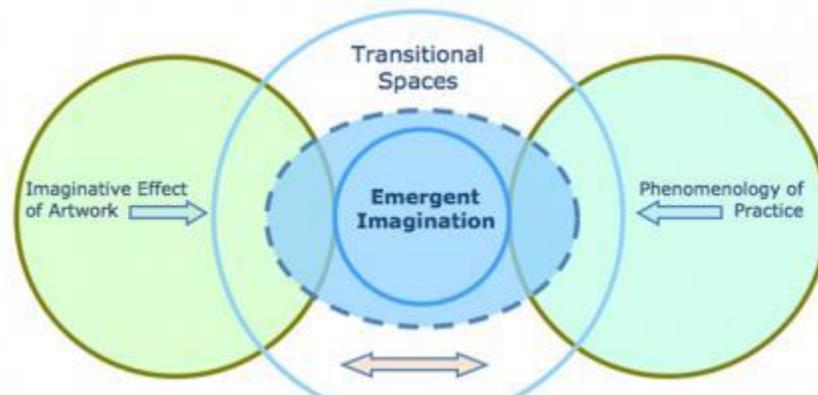


Figure 2. *A framework for the Emergent Imagination* (2010) © Denise Doyle

Far from the immensities of sea and land [...] isn't imagination alone able to enlarge indefinitely the images of immensity? [1]

Introduction

This paper presents a framework for what is termed 'the emergent imagination' (developed through a recent PhD thesis) that arises out of the transitional spaces created in avatar-mediated online space, and it examines how contemporary notions of the virtual have changed our framing of the imaginary. According to Edward Casey, "imagination (in Western thought) is not securely situated in regard to such decidedly different acts as sensory perception and conceptual thinking." [2] Perhaps this is because, "imagining is easy enough to enact as experience, but it is extremely difficult to capture in midair for the purposes of scrutiny and examination." [3] This paper considers the importance of investigating imaginative experience in relation to the process of artistic creativity and practice and discusses the ways in which the 'virtuality' of avatar-mediated online space impacts on the 'reading' of the artworks created in the space itself. Referring to the heterogeneities of space explored in virtual worlds, the paper argues that whilst the virtual remains connected to time, the imagination becomes connected to space, and through this a new set of time-space relationships in virtual space can be articulated.

Avatar-Mediated Online Space

Since its inception eight years ago artists have been exploring the virtual space of *Second Life* where the act of creating is already mediated through technology. The *Critical Works in SL* exhibitions were presented during 2008 and 2009 on Kriti Island, which acted as a laboratory space for ongoing artistic and imaginative practice research in *Second Life*. Central to the development of the space was the community of experimental artist practitioners who relied on a particular form of collaborative co-operation. The research began with a grass roots development from connections made within the space itself. As an artist-researcher, the main strategy was to create a presence on the platform and invite others to participate. Kriti was also a space for the presentation of the process of thinking in relationship to the key themes of the exhibitions, that of the imaginative potential of the space and the subsequent exploration of the relationship between physical and the virtual spaces. Following the realization of the exhibitions, interviews were conducted with six of the participating artists and analyzed for the artist's insight in the context of creating immersive and interactive experiences in the *Second Life* space. The accepted format of the artist's interview traditionally explores the tacit knowledge base of the artist's experience and draws out any impact on the artistic process. However, a further method was used for the analysis that exposed a previously unacknowledged layer of experience for evaluation, that of the phenomenological method of Imaginative Variation. In this approach, the interviews were analyzed to uncover the essence and meaning of an experience, in this case 'the artist's experience of being a creative practitioner in virtual space.'

What criteria can be used to examine and make sense of the array of artworks produced in *Second Life*, and how can the practice undertaken there in the lifetime of the platform be reviewed in the context of contemporary art or New Media practice? What modalities of art are being explored within the space? The concerns appear varied and multi-layered. There is the continuation of the contemporary arts discourse in the *Second Life* space, there is the anarchy of social engagement and participation, and there is the recreation of painted virtual spaces where the issue is either their ability to come to life, or the ability to do the unimaginable, to walk around and be immersed in pictorial space. This play of the

imagination incorporates the re-enactment of art and performance events. All of these movements and actions have come about on the *Second Life* platform during the last eight years.

Analyzing the Kritical Artworks

In his 2009 article, 'The Translation of Art in Virtual Worlds,' Patrick Lichty outlines a number of interesting questions with respect to artists working between the virtual, and what he terms the 'tangible.' He presents four modalities of art in which the modality "refers to the location and vector direction of the work's relation between worlds." [4] He suggests there are four modalities of art currently being produced in virtual worlds: the Transmediated, the Evergent, the Cybrid and the Client/Browser work. He explains:

This epistemological 'movement' within and between worlds has four basic structures; work that is essentially traditional physical art translated to the virtual, 'evergent' work that is physically realized from virtual origins, the virtual itself, designed entirely for the client/browser experience, and 'cybrids' that exist concurrently between various modalities. [5]

The transmediator, according to Lichty, "tries to align the tangible and the virtual," [6] and this movement is illustrated by the vector direction of the transmediated work from the physical world to the virtual world. According to Lichty, an example of work that is within this category is Marina Abramovic's *Seven Easy Pieces* (2005). A second modality of art are those built for the client/browser experience. The semiotics of these two modalities, the transmediated and the client/browser, are, as suggested by Lichty, "a straightforward affair." [7] The Cybrids, according to Lichty, "are less concerned with continuity, but are interested in the differences and distinctions between worlds and scales." [8] Both the Cybrid and the Evergent works demonstrate a "movement from virtual to tangible, which includes consideration of works existing in simultaneous physical and virtual components, [and] present more complex models." [9] This complex play within and between worlds, in particular "the enigmatic liminal works that live between worlds," [10] those spaces that are potent for the imagination, already demonstrate an array of creative potential in the *Second Life* space. My own project entitled the *Meta-Dreamer* (2009) could be considered to be an evergent work based on Lichty's proposition. Working with digital materialization expert Turlif Vilbrandt, [11] data was extracted from *Second Life* to create a digitally materialized object of my avatar, *Wanderingfictions Story*. By experimenting with digital processes and the type of material used, attempts were made to represent jade and clouded glass, amongst other textures. The end result can be seen in Fig. 1: the qualities of the figure are cloud-like and ethereal as though she (the meta-dreamer) is 'almost there.' [12]

The Emergence of Transitional Spaces

The vectors of movement of the four modalities of art described by Lichty can be considered to denote the directions and creations of meaning between the physical or tangible world, and the virtual world, and movements within and between virtual spaces themselves. These vectors of meaning are, in the Transmediated artwork, from the physical world to the virtual; and the vector movement of the Evergent artwork, is from the virtual to the physical or the tangible. A third vector can be placed within the virtual world space and denotes a circular and self-referential movement within virtual and imagined worlds themselves. A fourth series of vectors move between the spaces denoted as Cybrid spaces where connections and augmentations of artworks are multiplied and duplicated. However, these vector movements could also be considered to be that of the 'movements of the imagination' itself. If the

modalities of art and creation of imaginative effects are compared it appears that spaces in transition provide the movement where meaning is created. Through the research it was found that the imaginative effects created in the artworks and presented in the virtual world of *Second Life* arise out of four categories of transitional space: the surreal, the fictional/poetic, the emergent, and the spatio-temporal.

An outcome of the research was the development of a new framework for the imagination (presented in diagrammatic form in Fig. 2). 'The emergent imagination' can be seen to emerge from both the heterogeneities of space created in the imaginative effects of the artworks and in the artist's act of creating through a phenomenology of practice. The transitional spaces are at the centre of the framework itself and out of which 'the emergent imagination' comes into view. The conditions for the appearance of 'the emergent imagination' are seen both in the act of creation and in the outcome of the creative act itself. In the analysis of the imaginative effects of the artworks it was noted how the transitional spaces created suggest the presentation of space as a field of becoming. The heterogeneity of space created has at its base the multi-faceted experience of space and its changing relationship to time. Additionally, the phenomenological account of the artist's experience of creative practice in the *Second Life* space suggests a varied experience of embodiment and imaginative experience. [13] The wide-ranging accounts of the artists indicated the extent to which time, space, and time-space relationships were central to this experience. In the creation of the framework for 'the emergent imagination,' the experience of embodiment and the associated imagination of the senses may explain the visceral and material responses to the phenomenological experience in virtual space.

Time-Spaces of the Emergent Imagination

It is pertinent to consider Casey's description of imaginal space, imaginal time and the imaginal margin (following his first-person phenomenological study of the imagination) with respect to the framework for 'the emergent imagination.' In describing his experience of imaginal time, Casey writes that in the felt presence, "not only was there no single temporal matrix extending throughout [...] in each instance there was present a vague positioning of given items of content within a time span." [14] In describing imaginal space Casey writes, "in spite of their diverse and often truncated character, these varieties of spatial expanse were nonetheless intrinsic elements of the imagined content [...] for all such items of specific content are invariably presented as localized, if not strictly located, within imaginal space." [15] Finally, with respect to Casey's imaginal margin, it is described as, "the fading fringe found at the outer limit of specific imagined content [...] being almost entirely featureless, it cannot be given any definite location." [16] Echoes of the imaginal margin are found in the explanation artist Taey lohe provides of her experience of allowing her mind to drift in the *Second Life* space, not knowing if she sees a half wolf or a half dog at the edges of the world as though she is describing the space of a dream or reverie. [17] With respect to Casey's study, there is no real sense of the positioning of an imaginative experience in time and this is also the same for space. There is no real geography of the imagination in a physical, locatable, Cartesian sense and this is reflected in the heterogeneities of space experienced in avatar-mediated online spaces. A field (rather than a geography) of the imagination may be a more suitable account of the experience.

Doreen Massey, in an essay responding to the work of artist Olafur Eliasson, attempts to illustrate a set of relationships between time and space by using a narrative account of a journey between Manchester and Liverpool. In the process of traveling she suggests, "if movement is reality itself then what we think

of as space is a cut through all those trajectories; a simultaneity of unfinished stories.” [18] Furthermore:

Space has its times. To open up space to this kind of imagination means thinking about time and space together. You can't hold places and things still. What you *can* do is meet up with them [...] 'Here,' in that sense is not a place on a map. It is that intersection of trajectories. [original emphasis] [19]

If each space has a particular time, as Massey implies, then the transitional spaces that have been identified in avatar-mediated online spaces may also have a particular time attached to them. Not only, then, are there heterogeneities of space but also different sets of time-spaces that can also be located in the *Second Life* experience. The time-spaces of 'the emergent imagination' may also share their qualities with mythic time. Of mythic stories, Jay Griffiths writes:

[They] talk time out of mind, charm time and trick time, clogging it or stretching it: fables make time fabulously paradoxical, a stubborn blot on the face of clock-time but true to the time of the psyche, where past present and future are kaleidoscoped. [20]

Even Gaston Bachelard writes in the *Dialectics of Duration* of different levels of temporal experience:

As soon as we had acquired through mediation some skill in emptying lived time of all its excess and ordering the different levels of temporal phenomena into a series [we] saw that between this passing of things and the abstract passing of time there is no synchronism. [21]

All of these expressions suggest a plasticity to time as a lived experience, but also to the specificities of time-space relationships.

Conclusion

Sean Cubitt suggests that in online arts it is in the combination of a “spatialisation of time” and “the re-making of actual-virtual relations’ that the peculiar ephemerality of online arts makes new sense.” [22] The very notion that Cubitt expresses here is the very set of relationships discovered to be at the centre of a framework for ‘the emergent imagination.’ The analysis of the imaginative effects of the artworks presented in the two virtual (and physical) gallery exhibitions of the *Kritical Works in SL* project demonstrates a mode of artistic exploitation of the particular combination of user-generated and avatar-mediated spaces. These virtual, sometimes liminal and always transitional, spaces that emerge from the artworks are complex and multi-layered. A further analysis of a phenomenology of the practices of artists in avatar-mediated online spaces reveals that the imagination is experienced as embodied. A materiality to space is identified through an imagination of the senses that responds to the presence of the (imagined) body of the avatar. Here, the conditions for ‘the emergent imagination’ are best generated in avatar-mediated online spaces, where the experience of space is heterogeneous and where the plasticity of time-space relationships can be articulated.

This paper explored some of the philosophical implications of virtual worlds, through an examination of the concept of the imagination as that concept is seen in light of the pervasiveness of the virtual in our everyday lives. The thesis presented here posits that it is precisely in the generation of ‘the emergent imagination’ in avatar-mediated online spaces that we can best enrich our ‘real world’ lives, by applying

some of the emergent experience of the plasticity of time-space relationships and the heterogeneity of space itself to our lives in the world around us.

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NOSTALGIA TI FREGA

Carla Drago

Nostalgia Ti Frega is a photographic exploration of memory, identity and place that focuses on the emigrant community of a Sicilian village destroyed by an earthquake 40 years ago. This paper outlines the key influences across disciplines that have shaped the creative framework of the project.



Nostalgia Ti Frega, 2011, Carla Drago, photographic media, Copyright Carla Drago.

THE PROJECT

Nostalgia Ti Frega is a photographic project being completed as part of a Doctorate of Creative Arts at the University of Technology, Sydney. An exploration of memory, identity and place, the project focuses on the emigrant community of my father's Sicilian village of Salaparuta, destroyed by an earthquake 40 years ago. Aiming to capture a sense of the virtual space the village now inhabits, the project will consist of both digital and analog photographic objects: a limited edition set of photographs, printed on fine art paper, and presented in handcrafted wooden boxes will interact with a photo-book deployed on a tablet touch-screen device. Each printed photograph will be specially coded and, when detected by the digital photo-book, will unlock further, hidden content within it. As a digital object, the photo-book includes features that allow users in distant locations to comment on photographs and to curate and share their own chapters. Their engagement with the application will become part of the unfolding history of the village and its people.

The creative development of *Nostalgia Ti Frega* has drawn influence from several disciplines. Ideas around cultural change, including the effects of industrialization and globalization, the role of memory

and nostalgia in shaping identity; and the use of the imaginary within a shifting cultural context, are explored. The notion of the global village, including what it might consist of in a post-digital age, is a focus. Writing on haptic technologies and touch, and why these areas are increasingly important, has contributed to the creative framework, as has work in the area of material culture, particularly in relation to how objects relate to place and identity. Another important factor has been the use of user-centered design principles from the User Experience field of digital media. Developing out of the Human-Computer Interaction (HCI) discipline of Computer Science, UX principles are concerned with the effect (or emotional impact) on users when using digital products. Finally, the project also explores new approaches to storytelling, building on previous research that proposed a rhizomatic, nodal, non-linear storytelling framework specifically for interactive digital platforms.

THE VILLAGE

Salaparuta was a village of about 3000 people situated in the hills of Sicily's Belice valley, a few kilometres north of Santa Margherita di Belice and several kilometers west of Corleone. Like Santa Margherita, it had a castle and nobility, though after the reunification of Italy in the late 1800s and subsequent redistribution of land, the nobility left. Unlike Corleone, it was not a 'mafia' village.

The earthquake of 1968 was emphatic in its destruction. Several villages and towns were destroyed, 380 lives were lost, 1000 people injured, and 70,000 left homeless. With little local options available most of the population emigrated to Australia, Canada, the United States, and cities in the north of Italy. The rest camped in makeshift barracks and waited for new housing to be built nearby. Today the old village of Salaparuta is nothing more than over grown rubble; it is hard to distinguish where many buildings once stood.

As earthquakes go, the one that struck that winter was not a particularly strong one and, despite the tragic human casualties and destruction of property, did not come close to the catastrophic earthquakes Sicily's urban centers had experienced through history. However, unlike cities, which by their very nature are always in transformation and where destruction and redevelopment are customary elements and expectations of urban culture anyway, villages – usually understood as small hubs of human life in largely unpopulated landscapes – are very different entities. The entire physical presence of a village – its squares and meeting points, churches and cafes, thoroughfares and back-alleys – is intrinsic to how inhabitants socialize and interact, shelter from the environment and from strangers, and generally differentiate between the familiar and the unknown. In short, the physical space of the village is vital to an understanding of who, as a community, its inhabitants are and what their place, as a collective, in the world is.

While it can be argued that all spaces of habitation shape the identity of inhabitants, a village and its association with community, intimacy and belonging is understood to shape identity in a particular way. The notion of 'village' has in fact been used to understand and negotiate ideas around community and connection in many different contexts, from the destruction and redevelopment of urban landscapes, to the ability of mass communication to create a so-called 'global village.'

Traditional Sicilian culture is no different in this regard. The physical endurance of a village is a cultural reference point to the community that calls it home. It maintains continuity, is a reassuring anchor, and persists. So, when a village is destroyed and laid desolate, and, as in the case of Salaparuta, its people are scattered across the globe, what takes its place?

Even though not everyone from Salaparuta is directly related by blood, to be a *Salitanu* means to be part of an extended family of *paesani* (villagers) and to be treated as such. This extends to descendants as well, so that a child or grandchild (or great-grand-niece-twice-removed) is considered a member of the village, even if they have never been there. Clearly, many years after its destruction, a sense of Salaparuta persists. The village is no longer the same physical place it once was (at least not an inhabitable one) but it is certainly something somewhere in the hearts and minds of its people. It is this ‘something’ and ‘somewhere’ that *Nostalgia Ti Frega* seeks to explore.

NOSTALGIA AND IDENTITY

In his 1983 essay on postmodernism and consumer society, Fredric Jameson argued that the formal features of the post-modern world expressed the deeper logic of its social system; namely that it had “begun to lose its capacity to retain its own past, [had] begun to live in a perpetual present and in a perpetual change that obliterated traditions of the kind which all earlier social formations have had in one way or another to preserve.” [1] Jameson’s view was that people simultaneously lived in age that was radically disconnected from its past, but paradoxically, because of a pervasive nostalgia toward this lost past, were unable to articulate or describe the present or the very nature of their own environment.

He was essentially describing an identity crisis – the collapse of an established order and the resulting cultural void from which anything was yet to emerge. This is not unlike the migrant experience of the villagers of Salaparuta. The loss of old identity, precipitated through a physical disconnection to the homeland; a disconnection, creating a pervasive nostalgia towards the past; and this nostalgia, in turn preventing the emergence of new identities, are all hallmarks of what many migrants experience when adopting a new country as their home.

Jameson does not offer any way out of the bind he identifies. Dubious of our ability to experience what he saw in the 1980s as impossible dimensions, he calls for our bodies to “grow new organs, to expand our sensorium” and waits to see what the “new architecture” will bring. [2]

Over two decades later, it is clear that identity has certainly moved beyond Jameson’s postmodern stasis and is understood in ways suggesting we have indeed developed new dimensions. [3] Nostalgia too, rather than a stultifying, empty void, has grown new limbs, becoming something with the potential to enable hybrid, conflicting, previously impossible identities and histories.

In her 2001 book, *The Future of Nostalgia*, Svetlana Boym – an artist and migrant to the USA from the Soviet Union – dissects nostalgia into two prevalent types: “restorative,” which seeks the return to an original state and the recovery of an absolute truth (and which she aligns with nostalgic quests for restoration prevalent at the end of the 20th century) and “reflective,” which is a meditation on history and on the passage of time and perpetually defers a homecoming by cherishing shattered fragments of memory. “Reflective nostalgia does not pretend to rebuild the mythical place called home; it is enamored of distance, not of the referent itself. This type of nostalgia is ironic, inconclusive, and fragmentary.” [4]

Reflective nostalgia sits neatly in Boym’s artistic, Off-Modern art practice, “a detour into the unexplored potentials of the modern project.” [5] While *Nostalgia Ti Frega*, is not a radical experiment in terms of artistic expression, as Boym characterizes her art, it does embrace the notion of reflective nostalgia as a

tool through which to understand the paradoxical, hybrid, complex identities of its subjects, the *Salitane*, and their homeland today. As Boym states, “For many displaced people from all over the world, creative rethinking of nostalgia [is] not merely an artistic device but a strategy of survival, a way of making sense of the impossibility of homecoming.” [6]

MATERIAL CULTURE AND CONTAINMENT

Another focus of the project has been to consider the ways in which virtual ideas and emotions can be made manifest and expressed through material objects.

Part of this interest stems from the fact that photographs themselves, especially family photographs, are already objects that function in this manner. Historically, photographs and photographic objects have played important roles as repositories for both collective and individual memories, binding people to a sense of self and to each other. [7] Within Sicilian culture, photographs remain highly cherished objects with enormous emotional power. In the wake of the earthquake, when it was deemed safe to return to the village and recover what could be salvaged, photographs were considered highly valuable. They contained so many memories and emotions of lives now destroyed it is not surprising this was the case.

Photographs are also a potent example of how we use objects to understand ourselves and our relationships to others. In *The Comfort of Things* Daniel Miller demonstrates the manner in which people express themselves through their possessions, using them to both mediate interpersonal relationships and formulate a sense of self. [8] Greg Noble develops this approach in his work on the ‘cumulative self’ by considering the containers used to house our cherished objects. Specifically in relation to a shoebox containing photographs Noble writes:

The open-ness of the shoebox – [its] ability to function as [a form] of self-reflection and to undergo alteration – suggests that [it] be understood not in terms of containment as enclosure but as a form of containerisation, a holding together of objects for their safe transport. [It secures] the development of a stable but cumulative self because [it provides] both the mobilities and moorings necessary for ongoing existence in a complex world. [9]

Ideas around containment have clear synergies with reflective nostalgia – the ability for histories to be fragmentary and transformed by rearrangement, to offer more than one pathway, to move not in a single, straight, direction but inhabit many places at once. Given the evolving and emergent nature of the community at the centre of *Nostalgia Ti Frega*, incorporating technologies of containment into the project is a way to cradle the ever-shifting community identity, and also participate in its formation. Moreover, it enables the analog/physical aspects of the project (the wooden shoe-box) the ability to provide an emergent story experience, one the digital photo-book application will similarly provide.

POST-DIGITAL, POST-ARTIFACT

Rapid developments over the last two decades in telecommunications, digital technology, and interactive media, mean that people and communities can now connect in new ways. Identity and belonging are increasingly mediated through connections that take place in ‘virtual’ space and photographs are playing an important role in these connections. [10] *Nostalgia Ti Frega* takes its place within this digital

world by being presented, in part, on a tablet touchscreen digital device. Like the box for physical photographs, the tablet serves as a 'container' for the digital application. The size and mobility of tablet devices make them especially suited for this.

Importantly, tablet devices are heralding an interface paradigm shift away from the mouse towards touch – as the mouse transformed the possibilities of user interfaces, so too will touch and gestural interaction. Tablet-touch devices are relatively new, and innovative examples of narrative photographic applications for them still relatively rare. *Nostalgia Ti Frega* will explore the potential these devices offer, both from a user interaction point-of-view, and in relation to dynamic non-linear story experiences, ones that users themselves are able to contribute to. Incorporating ideas from reflective nostalgia into the user experience design, the application will be a platform where content can be transformed and re-arranged, story progression will not be singular or linear, and multiple-versions of the same story are possible.

This intent also neatly extends previous research completed as part of Masters studies in interactive multimedia. There, drawing correlations between 'experience,' as understood by information architects, and 'story,' as understood by film and television practitioners, I highlighted the importance of storytelling in the design of interactive forms of media, especially in contexts where traditional forms of storytelling were no longer as compelling. Using the concept of Rhizomatics, as described by Deleuze and Guittari (and taken up by others) as a basis, I suggested that an active and participatory experience design in digital interactive contexts be informed by non-linear methodologies of narrative. [11] *Nostalgia Ti Frega's* conceptual framework, informed so heavily by ideas from reflective nostalgia and containment, is an opportunity to experiment with this approach.

However, while digital technology has changed the types of social connections and stories we can now experience, we, and our world, are still physical entities. We exist in and in relation to a material world, and, as significant as our virtual connections may have become, our material context is still present and, crucially, still significant. Carol Wilder has speculated that our resistance to digital technology is because the experience of what we perceive to be more 'real' is more valuable to us than the experience of the high-tech. [12] Sherry Turkle goes even further in her 2011 publication, *Alone Together*, surmising that technology's increasing domination of our lives threatens to make us less human: "Under the illusion of allowing us to communicate better, it is actually isolating us from real human interactions in a cyber-reality that is a poor imitation of the real world." [13]

Creating a photographic work that embraces the potential of digital interactivity, while also keeping a firm anchor in the realm of the material, is a timely project. As such, the project – both digital and analog aspects of it – sits firmly within the paradigm of what Craig Mod has termed 'post-artifact': "ethereal and networked, emerging publicly in fits and starts. An 'artifact' complete for only the briefest of moments. Shifting deliberately. Layered with our shared marginalia. And demanding engagement with the promise of community implicit in its form." [14]

Ferdinando Scianna, one of Sicily's most preeminent photographers, began his career by documenting the changing culture of his own hometown. In the 2002 retrospective publication of this work, *Quelli Di Bagheria*, he stated: "I believe that the ultimate ambition for a photograph is that it end up in a family album." [15] In many ways, *Nostalgia Ti Frega* can be thought of as a new kind of family album, one specific to a post-digital, post-artifact age.

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ARTISTS AS THE NEW PRODUCERS OF THE COMMON (?)

ATHANASIA DAPHNE DRAGONA

This paper examines a new form of creativity, based on the commons. Using two projects organized in 2010 by the National Museum of Contemporary Art in Athens as case studies, it aims to define the features of this emerging creativity and to locate the challenges and changes formed for the creators involved in this process.

Paolo Virno writes that post-fordism is the era of the "communism of the capital." [1] The notion, which may be heard as a political (pseudo) paradox of our times describing a capital based on communality, is not a new form of utopia, however, it rather implies a new kind of accumulation and creation of value based on the expropriation of the common. Knowledge, information, affects, codes, social relations, the new 'artificial' common wealth, which is not inherited but is produced and shared by the 'posse' – the potentiality – of the contemporary multitude, is what is at stake and what is being capitalized today according to the Italian school of thought. Produced in the contemporary metropolis and the networked spaces we have come to inhabit, the common is the multitude's strength and its Achilles's heel at the same time. Continuously becoming and constantly expropriated, being abundant, dynamic and diffused, it can only be understood as a derivative of a life in excess and a life open to appropriation and control. Therefore, the 'communism of the capital' is an oxymoron expressing the controversies and questionings of the post-fordist condition. How can the multitude's capacities to think, to produce and exchange information and knowledge escape capitalization? How can they be reclaimed and by whom? If there is no longer an outside, as it is often being said, is there maybe a possibility for a change, which would derive from within?

This paper looks into the role of art in the years of the new common wealth. Taking into consideration the great number of projects which have been developed in the last decade and the references made to creativity in the context of the new discussion on the commons, a double-sided observation is attempted; not only on how forms of art encourage a swift of mentality towards the commons, but also on how the art world itself changes through this process.

The starting point for this positioning will be two projects initiated and curated by myself and organized by the National Museum of Contemporary Art, Athens, in 2010, the year when Greece started losing its financial independence. Seeking alternatives in the impasse of late capitalism, *Esse, Nosse, Posse: Common Wealth for Common People* and *Mapping the Commons, Athens* aimed to examine and locate the commons in their two main reservoirs, the Internet and the city.

Esse, Nosse, Posse: Common Wealth for Common People

Esse, Nosse, Posse: Common Wealth for Common People is an online platform launched in April 2010, as an open comment to the growing common wealth of the connected society. [2] The title is a reference to the Latin triad "I am, I know, I can," that having constituted the core of renaissance humanism, today interestingly reappears in order to describe the features of the contemporary multitude. [3] What is important is not only the knowledge itself but also our potential for its production and the formation of our subjectivities through it at the same time. Taking this into consideration, the online platform aimed

to refer –through a rich variety of artistic creation – to the motivations and capacities that form the new common wealth and to respectively discuss the controversies and risks lying behind it. To achieve this, *Esse, Nosse, Posse: Common Wealth for Common People* hosted: a) projects critically commenting on the new forms of networked wealth and b) initiatives and open platforms based on free and open software, encouraging exchange and collaboration. Selected texts were also uploaded as resources to provide a context for further discussion.

The issues tackled by the projects that were presented were the following: the passage from the fordist to the post-fordist society and the transformation of labor (*First of May* by Marcelo Exposito), the immeasurability of the immaterial work conducted in the networks (*User Labor* by Burak Arıkan and Engin Erdogan), the new forms of online labor based on virtual sweatshops (*Invisible Threads* by Jeff Crouse and Stephanie Rothenberg; *Gold Farmers* by Ge Jin aka Jingle) or on crowdsourcing (*Bicycle Built for 2,000* by Aaron Koblin and Daniel Massey; *re_potemkin* by .-_-.), the call for a free exchange of knowledge beyond copyrights (*Free Culture Game* by Molleindustria; *Perpetual Wall* by Dimitris Papadatos), the interweaved character of the networked economy (*All Over* by Samuel Bianchini), the imbalance of the information society (*Internet Art for Poor People* by Carlos Katastrofsky; *MAICgregator* by Nicholas Knouf), and the value of attention economy in territories of info-noise (*Falling Times* by Michael Bielicky and Kamila B. Richter).

While the above works were discussing the capitalist character of the networked condition, the platforms, that were also introduced, invited users to join efforts of collaboration, co-production and knowledge sharing. Initiatives by collectives with significant work in the field were listed, such as: Furtherfield, who encourage people to recycle their old laptops by offering them to the homeless (*The Zero Dollar Laptop*); Platoniq, who propose a platform of exchanging services (*The Bank of Common Knowledge*); or Mediashed who propose that people communicate their low cost products through their database (*Gearbox*). Escaping capitalization, control and appropriation, these efforts propose to users a different mode of engagement and production in the networks. At the same time, projects with a more specific character were also included. Such as the platform of Anders Weberg (*P2P Art*) who invites people to participate in the creation of an ephemeral common artwork based on peer-to-peer logic, or Brett Gaylor's *Open Source Cinema*, which invites users to upload and remix the videos online. The Artzilla team has also been included for its web browser modifications and subversions that support freedom and openness, along with the Shiftspace group who, in a similar approach, propose the placement of open source layers above any website. In addition, the network Kate Rich created for the fair trade of products is presented (*Feral Trade*), as is Dmitri Kleiner's *Telecommunisten* network, which offers tools and services that are owned by the workers themselves.

A new utopia or a breakthrough in the networked world? This entity of projects is only part of an emerging creativity on the Web which is based on the idea of the commons. However, can we realize our potential and re-orientate our disposal for socialization and knowledge towards the new liberated environments the artists propose? We might be in the beginning of a shift in mentality, yet it should be noted that the initiatives and actions discussed in the context of this paper are not being valued on the basis of their popularity or 'efficiency.' They are considered noteworthy for the stance that their creators take. What lies behind them is a call, an urge for a new system of values that can empower the growing common wealth. These values are to be found not solely within the Web, but also within life itself and especially in its most lively terrain, which is the contemporary metropolis.

Mapping the Commons, Athens

Mapping the Commons, Athens was a cartography project that followed *Esse, Nosse, Posse* reflecting a need to trace the commons in the urban environment and to examine their role in times of crisis. The project took the form of a cartography workshop conceptualized by the Spanish collective Hackitectura, which was commissioned by and hosted in the premises of the National Museum of Contemporary Art, Athens in December 2010. [4] The aim was clear: to map the city of Athens, restless and vulnerable as it was, according to its commons. The work was undertaken by an interdisciplinary group of artists and researchers from the universities of Athens, guided and supervised by Hackitectura; with contributions from artists, sociologists, scientists and theorists working on the field.

Seeing beyond the 'public' and the 'private,' the team sought for, examined and documented the different types of commons that were located in the urban environment. The elements of sociability, openness, sharing and accessibility were of primary importance during this exploration; special attention was given to peer-to-peer practices, community networks and forms of exchange economy. The entries enriching the cartography were decided and organized according to certain parameters related to the 'wealth' being produced, the community supporting it and the risks of its enclosure and exploitation.

The team successfully produced two maps: a research map, where all commons were described, categorized and located; and a video map where certain commons were developed into video case studies by the participants. Furthermore, a blog documenting the progress of the workshop was also created. However, the most important outcome of the project was the 'common' produced during the workshop itself; the knowledge that the community of creators, students, artists and theorists formed together while also building a common experience and imaginary.

Locating the features of common-based art

Taking the above works as examples, one can interestingly locate similarities that assist in recognizing the features of a new form of creativity which emerges on the basis of the common. The rich variety of works discussed – which may be categorized as net art, game art, software art; or as documentaries, interventions, databases and maps – all share a kind of openness and collectiveness which opposes previous ways of perception and evaluation in the contemporary art or new media art scene.

In an attempt to locate and summarize some of the main features of this creativity, the following points could be used as a start:

- The works, in their wide variety, do not constitute art objects or art installations; they present no certain aura and claim no art market value.
- They accordingly do not aim for the awe of the spectator; they do not impress by their aesthetics, techniques or complexity.
- They claim no authorship and no uniqueness; their power is in their distribution and diffusion.
- They are not cryptic or ironic; on the contrary, they aim to be direct, understandable and reachable.
- They address the citizens and users of the cities and the networks and not specifically the art audience, the art institutions or the art collectors.

The aim of this growing entity of works seems to be no other than to socialize knowledge. They are works that, as Matteo Pasquinelli expressed it, belong to the age of "social reproducibility," [5] which

followed Benjamin's age of 'mechanical reproduction.' We have gone beyond the unlimited reproduction of artistic objects and the loss of the aura of the prototype. The challenge for the works of art is a new one; it is the challenge for a "unicity without aura" as Virno put it, for a "non-original unicity which originates in the anonymous and impersonal character of the technical reproduction." Art's new aim, he argues, is to find the relation between the highest possible degree of communality or generality and the highest possible degree of singularity, the balance between the most general and the most particular .

[6] Are the works previously mentioned not a first step towards this direction as they refer to the common wealth produced by the general intellect on one hand and to the importance of the contribution of each singularity on the other? Is the presence of the artist's identity not lessened as works seek for a new balance between individuality and collectivity? Or rather between "multiplicity of individual expression and the unity of a collective will," between "singularity and solidarity, cooperation and freedom?"

[7]

This realization, however, leads to the need for the second definition: who are the creators that seek this new balance expressed as a "unicity without aura" for their works and why?

Describing the creators of commons based art/the new commoners

Discussing works based on collectivity, openness and lack of authorship, it easily becomes clear that we mostly refer to creators who are leaving the role of the 'artist' and moving towards the one of the initiator, the collaborator, the affective worker, the networked creator, the hacktivist. Often, the creators might not even be artists. In their shoes there are programmers, architects, lawyers, social scientists, or generally people from different fields who see creativity as an invaluable tool of expression, communication and resistance. This is a new generation of creators who wishes to merge with the 'audience,' blurring prior boundaries and hierarchies. What brings them together is the virtuosity, the social competences and the affective potentialities they all have and use in their virtual and urban interactions. For Virno, who assigns to virtuosity a central role for the post-fordist way of being, and sees creativity as diffused today, "each and every individual is, *at the same time*, the artist performing the action and the audience: he performs individually while he assists the other's performances." [8]

But what does such a realization mean? Do artists still have a role to play or they fade in the name of a new common and radical approach of creativity?

At this point, one needs to pause and reflect on some of the fundamental ideas of the common wealth on one hand and on the actions of the creators being discussed on the other. "There is no commons without commoning," wrote Peter Linebaugh, highlighting the fact that besides the common goods, the social practices of a community are also needed. There is no commons without the commoners; these are the individuals that not only produce and share the commons but also establish relationships of solidarity between them and fight to reclaim the commons that have been enclosed. While Linebaugh refers to the 'Magna Carta,' the commoners of the medieval England and the land enclosures, one could interestingly juxtapose this sequence to the inhabitants of today's cities and networks with the enclosure of the common wealth produced. What seems to be missing, however, is the cultural memory of a prior different mode of being and sharing that the commoners of land had, reminding them what there was to be reclaimed. [9] Missing this element, an urge for a common imaginary appears that – replacing common memory – will be based on the realization of the multitude's potentialities and will offer the ground to step on in order to reclaim the surplus of the knowledge and information which is being en-

closed today. A form of this common imaginary is what the creators are building through their initiatives, activating through it the shaping of new communities and new commons. Seeing artists as the new commoners therefore is the first point that can be made regarding their contribution.

A second point can become clear while looking into the formation of the new common spaces that the artists are particularly proposing which are beyond control and exploitation. The online collaborative platforms, the databases of exchange or the workshops organized can be seen as the new interconnected spaces that allow communities of commoners to be formed, offering to the worrying and restless multitude a new home and a new ground for social encounters.

Thirdly, the creators today may assist the contemporary digital multitude by encouraging the use of the tools that we all already have in our possession. What we need today is to learn how to work with language, codes, ideas and affects; and how to build relationships through them. [10] We need the knowledge and information infrastructure that artistic creation seems to be able to provide while avoiding at the same time the appropriation of these tools on the web and in the city environment by third parties.

Finally and hopefully, through such a process a new system and a new theory of value can emerge, one which would express the desire of the multitude for a liberated connectivity. As life is in excess today, as work and life have become one, a new balance can only be found through creativity that embraces the ideas of sharing and co-producing.

Reclaiming a new form of exodus

Open, participatory and rhizomatic, the new form of art emerging based on the commons seems to have some of the features that media art did not reach before. It is a form of art that tries to assist, to engage with the audience and to share knowledge. It informs and encourages transformation; it takes responsibility and helps the multitude to overcome its fears.

Although this new form of creation could be related to certain movements of art history such as Dada, for its recycling practices and its negation towards artist's authorship, to Situationism for its refusal to copyright, or to the movements of institutional critique; yet the creativity based on the commons presents an interesting differentiation. It is not necessarily anti-art or anti-institutional. It alternatively takes a stance or a point of view that looks beyond the art system and the art world. The artists do not negate art or the museums' structures and hierarchies. They often choose to address to them and propose new forms of collaboration that will need to be based on new grounds of openness and sharing. They often invite institutions to enter a game based on openness and diffusion of information and to surpass the constraints of ownership and authorship that might have impeded such an orientation. They ask museums to join their efforts towards the commons by providing the audiences a context for art practices related to sharing, by encouraging and presenting creators' alternatives to capitalism, by assisting in the formation of new common places and common values beyond institutional walls.

Facing the impasse of late capitalism, the creators of the works that were discussed in this context, seem to ultimately aim for a new form of exodus. This exodus however can only come from within, by staying where we are and by expressing a collective will for a change. The idea therefore is to "pursue a line of flight while staying right here, by transforming the relations of production and mode of social organization under which we live." [11] For this reason, the efforts of the creators to reach out and communicate ideas, to overcome themselves as names and overcome art as art, assist in the formation of a

multitude of commoners that can achieve direct experiences of co-operation beyond exploitation. This is a value that is worth noting and supporting for years to come.

This research has been co-financed by the European Union (European Social Fund – ESF) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF) – Research Funding Program: Heracleitus II. Investing in knowledge society through the European Social Fund.

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RE-CONQUERING THE GAMIFIED CITY: AN OLD BATTLE ON A NEW URBAN GROUND

ATHANASIA DAPHNE DRAGONA

What does the notion of gamification imply for the urban environment? In the last few years, images of new adventurous cities have appeared which offer excitement, fun and socializing to citizens who are full of energy and desire for challenges, rewards and status recognition. Is this an expanded gaming territory or an unfortunate ludic decadence? This paper addresses gamification by looking into an old battle, situated between 'game' and 'play.'

In the last few years, a new challenge appeared for the inhabitants of cities around the world. Gamification, the strategy of applying game dynamics and mechanics into non-game contexts, reached the contemporary metropolises and created a new ludic layer over them. Challenges, points and levels have been integrated into the urban environment inviting citizens to act as players and compete for achievements, awards and status recognition. Designed by location-based social networking sites, the new motivations for urban exploration are based on two fundamental human characteristics: our sociality and disposal for play. Being rewarded "for doing new things and for making a better effort to be social," the players engage successfully not only with different everyday activities, but also with life itself writes Jane McGonigal, arguing that the application of pleasurable game elements can actually assist in restructuring society in better ways. [1] While, according to this line of thought, a great game-based future might be opening ahead of us, one cannot help being reserved when confronted with such positivism. On which grounds does gamification really stand? This short paper will aim to discuss gamification by locating the contradictions and misrepresentations connected to it on one hand, and by situating the potentialities for its surpass on the other.

Gamification is a term describing a process applied not only to the urban environment but to a wider range of sectors, such as those of health, education, labor and the Internet, with a common aim: to affect and manipulate human behavior for the favor of the market. Although McGonigal chooses not refer to the market but to praise the process as a decisive solution for the impasse of today's reality, most of the gamification supporters directly discuss the possibilities game-like processes may offer to generate more customers, more advertisements, more revenue. For this reason, since its beginning, gamification has been met with hesitation by scholars from the field of game studies. Described as "exploitation-ware," [2] or as "a tactic employed by repressive, authoritarian regimes," [3] gamification has been doubted for its aims and values. The world might have always resembled a game, but never before did this resemblance manage to make profit per se.

Complementary to this first argument, a number of logical points can follow regarding the sense and impact of applying game dynamics and game mechanics to urban life. Do we really need extrinsic awards, for instance, in order to wander around in the city and decide where to stop? Do we need extrinsic motivation to meet our friends? Is having our movements and interactions tracked, controlled and used by third parties worth it, for the fun of the game? Gamification has therefore received a lot of critique not only for the profit that it generates but also for the devaluation of human activities that it encourages.

In addition to the above, scholars doubt the influence of the integration of points and awards into a non-game activity and the characterization of it as a game; these elements are actually the less important aspect of a game they argue. However, either the game resemblance is accurate enough or not: the features and techniques used are sufficient to trace the revival of an old battle between two fundamental notions, those of 'play' and 'game.' By setting rules and constraints, by enclosing certain locations in the map while ignoring others and by limiting the citizen's openness and freedom of choice, gamification's preference towards the 'game' becomes clear. Or, to remember Roger Caillois, 'paidia' seems to be defeated by 'ludus,' as the "arbitrary, imperative and purposely tedious conventions" of the latter take over the gamespace and push away the "frolic and impulsive exuberance"; the "anarchic and capricious nature" of the former. [4] The formation of the new controlled city, seems therefore to be in complete antithesis with what the Situationists once envisioned as the playful city, or more particularly with what Constant framed as the 'New Babylon.'

What a sad reversal and a disappointing cancellation of the revolutionary ludic thoughts of the past, one could note while reflecting on the 'New Babylon.' What a swap in the use of technology: from a means of liberation to a means of control, from the city planned for 'Homo Ludens' to a city planned for playful work. The 'New Babylon,' a city for play, leisure and adventure, a city where work would be automated and man would be free as in a utopian city. However, no one expected such a realistic misrepresentation of it where 'Homo Ludens' would become again 'Homo Faber,' seduced by game gimmicks and fouled by the impression that the game like interfaces of technology could empower him over the city. Although Constant wisely predicted the exciting ludic behavior the advance of technology and telecommunications would bring, little could he foresee the expropriation that would also follow. A city of movement, based on dynamic relationships between citizens and the urban environment was realized, but based on the inhabitants' disposal, sociality and potentiality.

In reality, the new gamified cities perfectly fit into the context of the post-fordist metropolises, of the new city factories where the multitude lives. The contemporary cities based on our knowledge, information, codes and social affects are being gamified; inviting us to produce more, while collaborating and/or competing with our friends. Gamification is in perfect alignment with the new modes of immaterial and affective production. We produce as we play. We work as we interact. The new realistic perception of ludic cities is based on our capacities and potentialities. However, for this same reason, no dead end has been reached yet: gamification can be opposed and this is possible only by again embracing play itself.

While a gamified image of the city is being created by interfaces, a different documentation of the contemporary metropolis manifests playfulness as an immanent element of today's multitude. The fragmented, anarchical, diverse and incoherent multitude in times of crisis and transition uses play to express and highlight its opposition and resistance. Masks, movements, actions appear spontaneously within gatherings and demonstrations. "The anger of the protesters coexists with their joy in the carnival," as Hardt and Negri note. "The protests are carnivalesque, not only in their atmosphere but also in their organization," which shows an enormous capacity for innovation; innovation to transform reality itself. [5] To see this image one needs to turn from the mobile interface to the image of the square, from the controlled gamespace of the market to the reclaimed public space of the city. The anarchical, impulsive elements of paidia are apparent; one only needs to set his eyes on the practices of the urban players around us. At stake today, therefore, are the potentialities of today's players/citizens, which can easily be used for the profit of the market through game like interfaces, or for the benefit of the common through tactics of playfulness. For the latter direction, players/citizens need to realize not only the set of possibilities offered in today's city gamespaces but also the ways value can be generated and exploited with their involvement.

In other words, we need to keep going back to understanding the rules and constraints of the 'game' and to being critical and playful at the same time. Else, the gamified corporate reality will slowly abolish common play. At that point, we might even be driven to a manifestation of a call to "Never Play" following the "Never Work" of the Situationists as a form of resistance, as McKenzie Wark writes in his latest book. [6] Could we prevent the ultimate ludic downfall of our times?

This research has been co-financed by the European Union (European Social Fund – ESF) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF) – Research Funding Program: Heracleitus II. Investing in knowledge society through the European Social Fund.

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BIOSENSING AND NETWORKED PERFORMANCE WORKSHOP

Anna Dumitriu

The Biosensing and Networked Performance workshops led by Anna Dumitriu and Tom Keene enable participants to build and calibrate their own iPhone compatible Galvanic Skin Response Sensors (GSR), which enable recording of subtle changes in the user's emotional arousal. Participants then collaborate to develop a networked performance that engages with the ethical implications of disclosing such personal information within the public realm.



"Biosensing and Networked Performance" by Anna Dumitriu & Tom Keene, materials: electrical components, smartphone. Photograph copyright Anna Dumitriu.

Participants learn to solder and connect their own GSR sensors, connect them to their iPhones and share their sensor data online. The workshops create a framework for debate around the implications of new social networking and pervasive computing technologies and the increasing issues of privacy as, increasingly, our most personal details can be recorded and shared. Finally participants work with the workshop leaders to improvise, plan and rehearse an intervention performance work that is performed at the end of the workshop. This performance may be very subtle and not immediately obvious to any (unwitting) audience members that may be around, playing with ideas of what we do and do not reveal to those around us both in the physical and digital sphere.

The project builds upon artistic research undertaken by Anna Dumitriu in her role as artist partner on an EPSRC funded project "Supporting Shy Users in Pervasive Computing" working with an interdisciplinary team of sociologists, computer scientists and human-computer interaction specialists at The University of Sussex. The project is investigating how pervasive computing is changing the ways social interactions occur, how we are becoming socially present in an increasing number of ways (sometimes without even realizing it), what our digital presences say about us through the data that is being recorded and how that data can be used.

Whilst in some ways technology may enable a reassuring sense of invisibility and anonymity (in terms of creating digital avatars and being able to use false names) it can also lead to obsession with self-image, fears about how one is perceived and confusion about how to present oneself or how to behave. This can lead to a feeling that there is a need to 'perform' and a sense of being laid bare, even provoking a form of 'stage fright' as described by sociologist Susie Scott an investigator on the project:

"...feelings of shyness arise when one perceives oneself as relatively incompetent at interaction, and fears being exposed as a poor team player. If we anticipate that we will say or do 'the wrong thing' and face embarrassment, surely it makes perfect sense to defend oneself emotionally by remaining quiet and avoiding the spotlight of a front-stage performance." (Scott, 2006)

Interactive digital art is a useful example of a piece of technology that is intended to promote high levels of engagement but can often evoke feelings of shyness in visitors, as the works presume that visitors are actively engaged and willing to 'find their own ways' through a work and explore how to playfully interact with it. Ironically sociologists' findings from this large-scale project show that the *majority* of visitors feel they lack the competence to actively engage with interactive art (and this includes artists and gallerists), especially in front of others that they perceive to be more confident performers. Intimidated, they tend to feel that there is a set of rules that others are aware of and that they do not have access to. So they prefer to fade in to the background rather than let the side down by failing to perform 'in the correct way'. Scott argues:

"Shyness is a normal, socially intelligible and communicatively rational (Crossley 2000) response to dramaturgically stressful situations. Shyness involves a feeling of relative social incompetence: of 'not knowing the rules' of social situations, as if there is a 'right' way to manage them. This is accompanied by a perception of 'Competent Others' around oneself who do appear to understand these rules and seem better equipped to perform appropriately. When faced with this risk of 'getting it wrong', being embarrassed, being scrutinized and judged by a critical audience, inhibition makes absolute sense as a dramaturgical response." (Scott, 2007)

In response to this research, the Biosensing and Networked Performance workshops seek to engage participants not only in the hands on building of the technology they are working with but, importantly, in the creation of a set of rules that will be used to generate new performance work of their own making.

The simple biosensor device used in the workshop is a Galvanic Skin Response sensor (made using easy to find components and a 'hardware hacker' approach) that measures the electrical conductance of the skin and can be attached to a wearer's finger to measure subtle changes in sweat levels. Sweat glands are controlled by the sympathetic nervous system so skin conductance is a useful indication of fluctuations in psychological or physiological arousal. The data produced by the device is then input into the iPhone via its headphone socket and uploaded to an online sensor data sharing facility using a method developed by Keene.

As arousal levels reach certain thresholds they can be used to trigger text messages and other outputs via a software interface written by Alex May (based on work done by ESKINDIR ASMARE as part of the wider research project). These text messages are part of a predetermined script for a generative performance written by the workshop participants. Based on the GSR data from one member of the group, the others can enact various 'flash mob' style behaviours. For example members of the group may drop their knees in unison on receiving a certain text message cue, others around them having no idea what the trigger for this was. However actions may be far subtler such as participants yawning in unison or even just touching the corners of their eyes, almost imperceptibly. The rules, the behaviours and the text messages are invented as part of the workshops.

In many ways the idea of sharing your emotional states online is a difficult issue. Technically GSR is not an ideal method. The only genuinely effective method for scientifically describing emotions is functional magnetic resonance imaging (fMRI) and this is not in any way portable. But the most problematic issue is already with us: pressure from others to subscribe. It is already the case that some employers insist that employees register with location tracking systems such as Google Latitude. Not only that but parents also use the same software to track children and partners to track loved ones. It is difficult to extricate oneself from being tracked if it is not desirable. How do you tell a loved one 'I no longer wish you to know where I am'? It would be even harder to say 'I no longer wish you to know how I feel' even if at the start of a new relationship you enjoyed sharing every inner secret, this may not always be the case.

Reflection on key issues around developments in pervasive computing is central to the development of the work and the workshops consider what the future possibilities and implications of ubiquitous biosensor data sharing might be; they look at what ethical issues need to be considered; how technologies impact users on a personal level? (This includes the impact on "shy users") and what the technical difficulties of implementing the automated sharing of emotions via ubiquitous technologies are.

This work was supported by the Engineering and Physical Sciences Research Council, grant EP/F064330/1.

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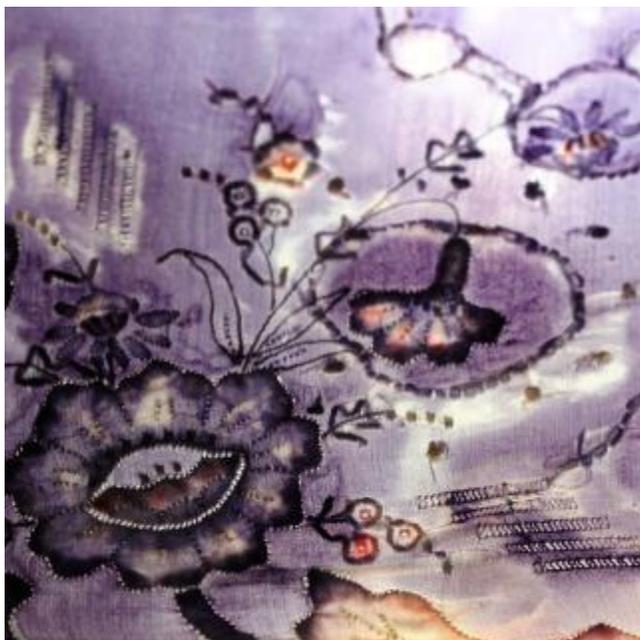
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COMMUNICATING BACTERIA

Anna Dumitriu

The *Communicating Bacteria* Project combines bioart, historical textile techniques and 3D mapped video projections to explore new research currently being undertaken in the field of bacterial communication, to engage a wide audience in the field and increase debate and understanding of this potentially new form of infection control. The project is funded by The Wellcome Trust.



"Communicating Bacteria" by Anna Dumitriu, medium: antique embroidery, contemporary embroidery and bacterial pigments. Photograph copyright Anna Dumitriu.

Bacteria have intricate communication capabilities, for example: quorum sensing (voting on issues affecting the colony and signaling their presence to other bacteria); chemotactic signaling (detecting harmful or favorable substances in the environment); and plasmid exchange (e.g. for transfer of antibiotic resistance genes). This is now being investigated as a form of social intelligence as it is realized that these so called 'simplest' of life forms can work collectively, obtain information about their environment (and other cells) and use that information in a 'meaningful' way. Using signaling chemicals such as *Homoserine Lactone*, the bacteria pass on messages to nearby cells, which can be either part of their colony or other living cells (including eukaryotic and plant cells).

The project is led by artist Anna Dumitriu; in collaboration with microbiologists Dr Simon Park and Dr John Paul, and video artist Alex May. Dumitriu's long-term artistic practice is focused around microbiology and collaborative practice. *Communicating Bacteria* [1] builds strongly on her earlier work – including *Cybernetic Bacteria 2.0*, a digital media installation presented at ISEA 2010 – and current role as artist in residence on the on the UK Clinical Research Consortium *Modernising Medical Microbiol-*

ogy Project at The University of Oxford, Nuffield Centre for Clinical Medicine, which looks at the changing face of medical microbiology in light of the possibilities of (near) real-time genome mapping of bacteria and developments in bioinformatics.

The importance of the public understanding of microbiology cannot be understated. Many businesses play on public fears in order to add value to their products, while newspapers and TV shows fill our minds with images of bacteria as armies of tiny monsters ready to attack unless we buy some new hand wash or detergent.

The infection control potential of interfering with bacterial communication and quorum sensing mechanisms is at an early stage, however it is known that:

This 'census-taking' enables the group to express specific genes only at particular population densities. Quorum sensing is widespread; it occurs in numerous Gram-negative and Gram-positive bacteria. In general, processes controlled by quorum sensing are ones that are unproductive when undertaken by an individual bacterium but become effective when undertaken by the group. For example, quorum sensing controls bioluminescence, secretion of virulence factors, sporulation, and conjugation. Thus, quorum sensing is a mechanism that allows bacteria to function as multi-cellular organisms. [2]

Therefore, the ability to block the receptors that receive quorum sensing signals would lead to bacteria that are no longer able to turn on those processes. To be able to block the expression of virulence factors (such as bacterial toxins) would render highly pathogenic organisms far less dangerous. Further down the line an understanding of the exact signaling mechanisms might even lead to the possibility of directing the behavior of bacteria.

The *Communicating Bacteria* Project involves the development of a body of new work, including: textile designs stained with dyes made from bacteria that change colour depending on the behaviour and communication of bacteria, crochet patterns based on bacterial responses, interactive interventions that are modeled according to behavior and communication between bacteria, and a series of hacked antique whitework embroidered pieces created using genetically modified bacteria.

Textile art has a long history of communicating difficult and complex stories and ideas, from the Bayeux Tapestry to the AIDS Memorial Quilt. The soft qualities of the fabric and the skills of the makers help to reach out to a wide audience of all ages. Dr Simon Park had previously created a number of previous works involving the staining of cloth with bacterial pigments (and slime moulds) and his expertise and inspiration was integral in the development of this project.

The antique whitework (white on white) embroideries are worked in to by hand with delicately stitched images of bacteria and communications networks. Dumitriu's modern stitches are far heavier handed than those of the original makers, creating an interesting juxtaposition. Additional patterns are created using a genetically modified strain of *Chromobacterium violaceum* called CV026. *Chromobacterium violaceum* is white in its natural state but turns purple when it receives a communication; but, since bacteria grow in colonies and individual bacteria are continually sending and receiving signals it always appears purple. However, the CV026 strain is effectively mute. It can receive a chemical communication signal but cannot send one, so it only turns purple in the presence of a communication from another bacterium. When exposed to unmodified *Chromobacterium violaceum* it slowly turns purple as the chemical signal spreads.

Around the time of the enlightenment, the perversely difficult practice of whitework embroidery was considered to be one of the highest levels of achievement for a woman. They would sew in the evenings by candlelight, straining their eyes to see the tiny stitches, hunched over their embroidery hoops, their bodies twisted and constricted by tight corsetry, one pinprick of blood meaning the whole piece would be ruined. This coincided with the period in which many of their male counterparts started to become 'gentleman scientists' and to rigorously study the world around them 'scientifically.' This was the time when the scientific method was developed and disciplinary boundaries were drawn between art and science. By juxtaposing whitework with her scientific practice, Dumitriu considers these paradigmatic changes in the process of research and current moves towards transdisciplinarity, alongside a consideration of what 'feminine' approaches to science might mean.

Central to the installation is a stunning antique Edwardian whitework dress, with Dumitriu's additional stitching and a purple pattern created by the process of bacterial communication. The dress was laid out on a one meter square agar plate (a makeshift Petri dish from a DIY centre normally used for mixing concrete and sterilized with ethanol), inoculated with CV026 and left to grow, be absorbed into the fibers and travel along the fine stitches. After a day or so of incubation the white CV026 was exposed to the *Chromobacterium violaceum* and the communication signal traveled across the fabric as the white bacteria turned purple. This process was filmed using time-lapse photography and the resulting film was projected, using 3D video mapping technology (developed by Alex May) across the dress and related objects within the final installation. The dress having been dried, sterilized and made safe.

The project continues to be developed and work is now being undertaken to develop methods to exhibit the process taking place live and run participatory sessions working with the team. This entails the development of a modular Category Two bio-containment facility that can be constructed within art gallery settings, whilst fully conforming to health and safety requirements and enabling a much deeper level of engagement and understanding of these complex microbiological processes through a powerful and experiential artistic approach.

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THE EMERGENCE OF CONSCIOUSNESS

Anna Dumitriu

The Emergence of Consciousness project is an artistic investigation of the scientific study of consciousness and the possibilities of 'machine consciousness' through the use of performance art and digital media. Dumitriu worked with sensory and movement deprivation (e.g. blindfolds, physical restraints etc.) and augmentation, in an attempt to take on the role of a robotic agent herself and try to understand what it *feels* like to be a robot.



"The Emergence of Consciousness" by Anna Dumitriu, performance with Bondage tape, lidocaine, robot, earplugs and digital projections, photograph copyright Anna Dumitriu.

The issue is that we tend to think we know what a *conscious* experience is and our inner mental lives are filled with assumptions about the conscious experiences of others, we believe we know how they feel and we assume they have some insight into what how we feel. We have what's known as a "theory of mind" and are able to identify other "minded" subjects. But these abilities are set to be thrown into question as developments in artificial life (AL) technologies lead to the potential to build robots that give the impression of being "minded" in some way. Thomas Nagel's paper "What is it like to be a bat" suggests that it is not possible for us to imagine how it would feel to be a bat because bats use sonar to navigate their world, something we could not imagine as we have no understanding or experience of it. However technological advances may offer us limited access to "new" senses, even in the short term and we can learn to incorporate them, perhaps enabling new insights. An example of this is the "Enactive Torch" built by Tom Froese and Adam Spiers, which: "provides the user with one continuous channel of vibro-tactile feedback to the hand, where the strength of stimulation depends on the distance to the object which is currently pointed at. The distance is measured using an ultrasonic sensor."

Working closely with researchers from the Centre for Computational Neuroscience and Robotics at The University of Sussex during her artist's residency there Dumitriu investigated notions of what "conscious

experience” might mean for a robotic agent in contrast to a human (the artist herself). The project, which was created as part of the London 2012 Cultural Olympiad is inspired by perspectives of embodiment as characterized by Francisco Varela, Evan Thompson and Eleanor Rosch, and situatedness as applied to evolutionary robotics by Rodney Brooks. This research was used to develop a new work, which was performed at Lighthouse in Brighton in July 2010. For the piece Dumitriu attempted to take on the role of a robot agent by reducing (as much as humanly possible) her sensory input down to that of her collaborator a medium sized robot whose only interaction with the world is through its limited sensors and wheels). Working with an assistant (Luke Robert Mason) her ears were blocked with earplugs, her head and body were wrapped in thick black bondage tape to block out her vision and restrict her movement and her skin was coated with Lidocaine cream (local anaesthetic). She was given a walking cane to sense her world with (as suggested by Dr Inman Harvey as being a close analogue for the robot’s sonar). In the performance the robot attempted to find the centre of the room using a control system evolved using a genetic algorithm and a single sonar sensor, Dumitriu attempted to find the centre of the room using her remaining sensory capacity and a counted the paces she took to get from one side to the other. The robot method is faster in this case and the Dumitriu’s very human approach is a demonstration of the incommensurability between artificial and biological life but nevertheless the work demonstrates clearly just how different ‘machine consciousness’ might be. These ideas were also brought out in digital projections to accompany the performance created artist Alex May.

Taking on the role of a robot agent is not a trivial process. The idea that a robot phenomenology is something that we could access is a contentious and flawed idea, however, an attempt to mimic the phenomenological experience of a robot should be of interest. The possibility of impoverishing the artist’s sensory experience to that of a robot is not achievable and neither is the idea of an artist replicating the functionality of a wheeled robot through her own physicality. However the ongoing performative experiments reveal to both the wider public and to invited scientists and philosophers many of the issues inherent in developing machine consciousness, potentially revealing new insights whilst acting as a form of public engagement in robotics research.

In her experiments Dumitriu has attempted to enact “robot experience” with particular focus on Francisco Varela’s work on how a robot might be considered to “mindfully” interact with the environment in which it is embedded. It focuses only on the sensor data it can receive and react to and not concerned with the floods of thoughts and emotions that fill (and pollute?) our human minds.

The practical aspects of the project are important to Dumitriu’s understanding and Dumitriu built the robot agent from scratch in collaboration with a robotics specialist. The wheeled robot has the capacity to take in a large number of sensory inputs but currently is just using sonar. It is important for the work that Dumitriu understands fully how the robot is constructed in order to deconstruct it psychologically for the audience.

The work done in the Emergence of Consciousness project is now being built on in Dumitriu’s new collaboration with the University of Hertfordshire where she and fellow artist collaborator Alex May have been appointed as Visiting Research Fellows: Artists in Residence in The Adaptive Systems Group (since January 2011). They are now working closely with Professor Kerstin Dautenhahn and Dr Mick Walters to develop a series of speculative robot heads designed to provoke the audience to think about their feelings about the possibilities of living with robot companions. It asks the audience to consider the field of social robotics and what they actually want in robot companions; how they should look, move and whether they should appear to be humanlike or ‘minded’. The first of these heads was exhibited at the Science Gallery in Dublin (April-June 2011) as part of their exhibition “HUMAN+ *The future of the*

species” and included a humanoid robot body built by the University of Hertfordshire with a head created using rear projection 3D video mapping and a hacked Microsoft Kinect that is able to take on the appearance of anyone looking at it (in group situations it creates a composite based on proximity). The idea is that users may prefer a familiar face but the work plays with the sense of the uncanny as users begin to recognise themselves (a disjuncture perhaps between the sensation that something is minded and the knowledge that it is not). The title of that head is “Familiar” and also references the idea of the ‘witches familiar’ (in mythology this is often a black cat), a creature which ‘appears only at a time of need’, ‘can act on the witch’s behalf’ and ‘can change shape’. Technology as witchcraft?

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UNNECESSARY RESEARCH, WHAT'S THE POINT?

Anna Dumitriu

This panel outlines “The Institute of Unnecessary Research”(IUR) and presents a new paradigm in the way artists are engaging with the world through transdisciplinary practices. It brings together art, science and philosophy by creating participatory audience experiences. Sometimes humorous and sometimes grotesque, our work pushes boundaries and critically questions the means of knowledge production in the 21st Century.



Artists are innovators, if a new piece of technology or a new medium, becomes available; artists want to try it, to experiment with it- from microbiology to robotics; from tissue culture to neuroscience. Some artists take on the role of a scientist in almost a performative way and some scientists become artists themselves. Philosophy and ethics is always at its core and the work unpacks the instrumentalization of science and art for commercial and political ends.

Forms of “connective aesthetics” (Gablik) are used to engage audiences in participatory experiences that extend and generate new outcomes through exhibitions and events going beyond simple interactivity, throwing authorship into question, as members of the audience are inspired to become Unnecessary Researchers in their own rights.

The IUR was founded in 2005 by Artist Anna Dumitriu following discussions at the “Rules of Engagement” Conference on the nature of Art and Science collaboration, held at York University, UK and organized by Arts Council England. The original ‘blue sky’ vision for the IUR was a major research facility where scientists were employed to work with artists, thereby avoiding the common situation of scientists’ lack of availability/time when engaged in art/science collaborative projects. Scientists tend to view a collaborative art/science project as extra-curricular to their ‘day jobs’, whereas to an artist the collaboration is often key to their ‘day jobs’ in terms of being either a grant funded project, commissioned piece

or artists' residency. This inconsistency is one of the biggest hurdles for art/science collaboration to overcome, often far greater than issues, such as funding, audience engagement and linguistic incommensurability. Key to the notion of art/science collaboration are these reoccurring questions, "What is the purpose of it?" "What can an artist offer to science", "In terms of art, why engage with science at all?" "What levels of cross-fertilization should happen" and most importantly "what has art got to do with knowledge anyway?" The IUR attempts to work with these questions.

There are obvious financial issues with building a major research facility for artists to work with scientists (the IUR favours a underground facility carved out of a rocky island that can only be reached by boat or helicopter (for purely aesthetic reasons)) so it was decided that The IUR should initially be started as a hub for artists or scientists working a high levels of trans-disciplinary practice, strongly concerned with the philosophical implications of their methodologies, interested in public engagement and practicing in ways that could be described as 'performative' in nature. A web site was set up in 2005 and a very low-key performance event took place in Dumitriu's studio above The Phoenix Gallery in Brighton, England. Since then the has project attracted wide interest and has grown form there, including further performances and interventions at Sussex University, The Whitechapel Gallery in London, ETH in Zurich and as part of many festivals.

The Institute of Unnecessary Research is now an international hub for researchers and artists working experimentally and deeply engaged with their specific research areas. We present our research through performative and experiential methods, engaging the public and new audiences in our ideas.

The IUR uses performance as a means of conveying research; often events have an interactive component, the audience taking part in experiments and research activities thus changing the direction, development and final outcomes of the artwork. Critical theorist Suzi Gablik discusses in her essay on "Connective Aesthetics" that the traditional relationship of the artist to the artwork has come to be superseded, and that this social role of art has become increasingly important, since there is:

".. a rejection of modernism's bogus ideology of neutrality. Many artists now refuse the notion of a completely narcissistic exhibition practice as the desirable goal for art". (Gablik)

Artists have now come to see the process as equal to, or even more important than the outcome, or the performance is more important than the documentation of it. So the means of production of the artwork as a dialogical and collaborative process is also the outcome of the artwork in this model, which is what makes it so relevant to Art/Science practice, it is an analogue of the typical, natural relationship of the artist to the scientist (and vice versa), the journey rather than the destination. Although not inherent in all Art/Science practice it would seem logical to include the audience in the collaboration, with their own vast tracts of knowledge and experience. Gablik states:

"..there is distinct shift in the locus of creativity from the autonomous, self contained individual to a new dialogical structure that frequently is not the product of a single individual but the result of a collaborative and interdependent process". (Gablik)

This influence of performative, dialogical aesthetics, which comes from the collaborative structure of Art/Science practice makes it a useful technique for reaching out to new audiences in a non-hierarchical way. But these forms of collaboration are not easy and require huge conviction, and effort from all partners involved.

The IUR mimics and subverts the Institutional model it is based on. There are various 'departments' each 'headed' by an unnecessary researcher. The 'department' names are created by the individual artists, scientists and philosophers and based on their personal research areas. When a researcher joins they come up with a 'department' name, if they leave (and the IUR is a dynamic group in this sense) it is likely that the 'department' is discontinued (at least for a while)

For instance the Head of Crockery resigned his role (from within the online cyber world Second Life in 2006), as part of a multimedia performance at Sussex University, the position of Head of Crockery currently remains unfilled.

There is no official selection procedure for department heads, unsolicited enquiries are responded to with a warning that selection procedures "are entirely nepotistic", in fact the IUR grows organically through increasing networks of international contacts. Current departments include: 'Projective Geometry' (Alex May), 'The Digital Simulacra' (Luke Robert Mason), 'Neuroplastic Arts' (Gordana Novakovic), 'Textile Abuse' (Bettina Shuelke) and 'Viral Contagion' (Tagny Duff). There are currently 25 departments across distributed locations and the project is directed and co-ordinated by Anna Dumitriu (whilst working on her own research interests which cross microbiology, artificial life, robotics and ethics).

The name "The Institute of Unnecessary Research" is, in many ways, confrontational. It raises the question what is necessary research? Unnecessary does not imply pointless, it often means going beyond the normal (in the Kuhnian sense of 'normal science') and crossing boundaries, asking where do we draw the line with what we study or with what can be studied? Unnecessary Research encourages eccentric, obsessive, creative working practices and is an antidote to the stranglehold placed on research by central government and the gatekeepers of academia.

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COLOURBLIND: MACHINE IMAGINATION, CLOSED EYE HALLUCINATION AND THE GANZFELD EFFECT

Alan Dunning & Paul Woodrow

The Einstein's Brain Project is a group of scientists and artists working together to develop installations and environments exploring ideas about consciousness and the new constructions of the body. Recent work has used strategies taken from paranormal science and psychology to explore how interpretation in shared machine-human environments contributes to the construction of our worlds.

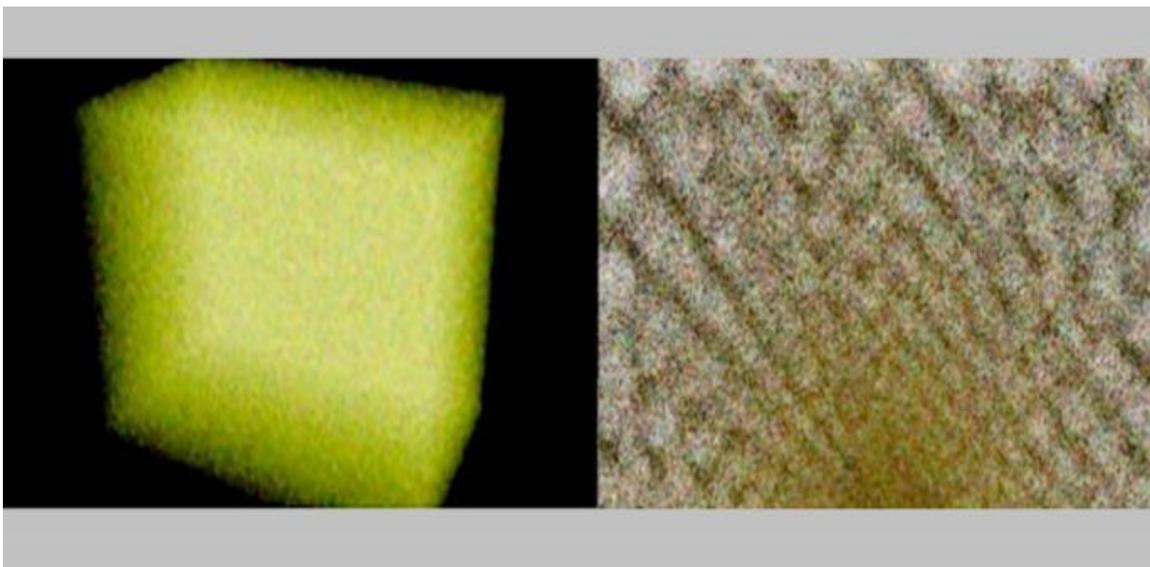


Fig 1. ColourBlind, 2010, installation View, © Alan Dunning

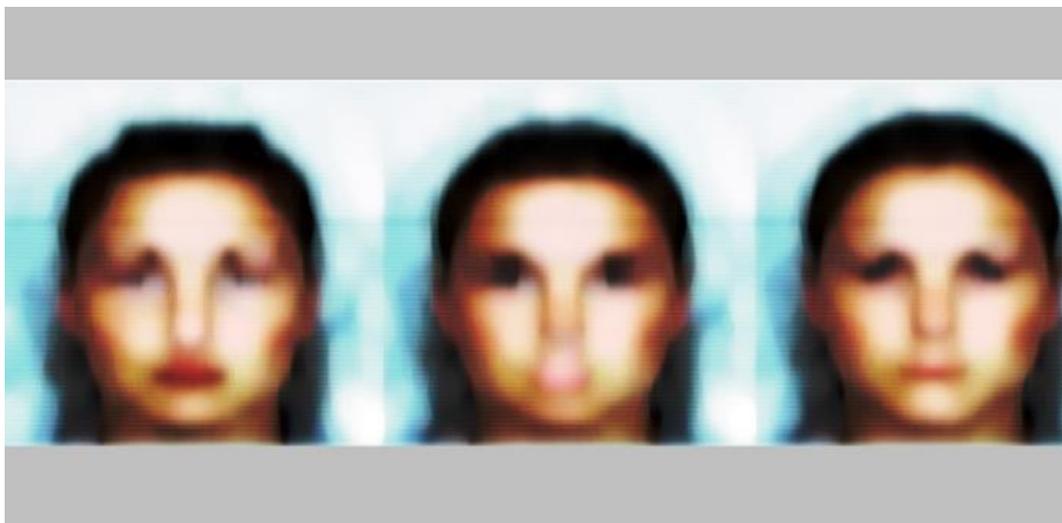


Fig 2. Doppelganger, 2011, installation view, © Alan Dunning

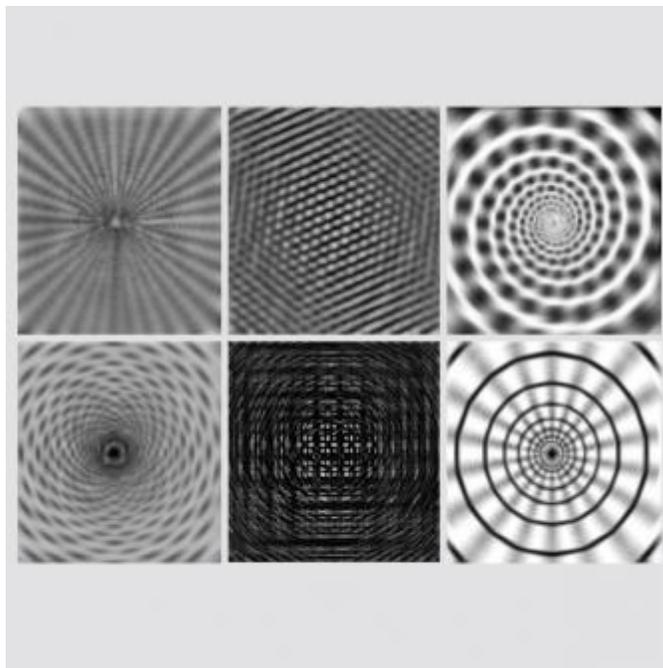


Fig 3. Typical patterns seen in CEH, © Alan Dunning

This paper introduces and contextualizes a series of new works – ColourBlind - that explores the internal workings of a machine through an implementation of the Ganzfeld Effect and Closed Eye Visualisation insofar as they relate to ideas about hallucinations in human and machine hybrids. The work explores ideas about machine vision and how hybrid interpretation gives rise to unbidden and unexpected colours, images and patterns in streams of unstructured data, and how undifferentiated monochrome colour can affect interpretation imagination. Through an examination and analysis of visual system noise expressed as spatial temporal voxel volumes, the work explores these investigations as machinic hallucinations.

The Project's work is focused on how new representations of the body can conflate the virtual, symbolic and imaginary through the use of interactive performances, environments and installations that promote a high degree of disorientation and an awareness of the moment to moment construction of a self. Recent work has developed generative systems in order to reference ideas inherent in EVP (Electronic Voice Phenomenon) to examine ways in which we construct worlds, and bodies in worlds, through pareidolia - the psychological phenomenon involving a vague and random stimulus - often an image or sound - being perceived as significant, and apophenia - the seeing of connections where there are none.

This work has used, amongst other strategies, face tracking and feature recognition, to explore the felt presence of absent bodies, using intelligent symbiotic systems, comprising both machine and human vision and analysis, to reveal patterns – the shapes of faces, the sounds of voices - in apparently random visual and audio noise. These works explored the construction of a world delineated by presence and absence, and pattern and randomness, locating the body through a construction that is both machine and human.

In recent times the development and dissemination of computer generated imagery has made commonplace constructed visual spaces that are fundamentally different from the mimetic and naturalistic representations of traditional media like painting, photography and film. But it is the increasing prevalence of machine and computer vision, and seeing machines, which has produced the most radical shift in the manner in which the world is perceived and constructed. This habitual employment of technological devices and programs has reconfigured both our conceptual and perceptual frameworks to the extent that what might be called natural vision is beginning to be superseded by machine vision. This suggests that vision is becoming disengaged from human needs and is now transferred to a technological plane.

The Project's exploration of hybrid perception and interpretation in shared machine-human environments concentrates on the idea that any visualization is a complex manifestation and indication of internalized machinic activity. In previous work we have been forced to acknowledge that our visualizations are constructs that are not uniquely related to the information that generates them. They are a complex hybrid of machine analysis, human interpretation, and scientific and artistic vision, which promotes a remapping of information beyond its immediate functional value. The drive to fill in the spaces opened up by those parts of an entity that resist their informational links, produces what we might only think of as false positives, but in doing so brings into focus acts of cognition that are inextricably linked to the building of meaning, the understanding of narrative, and, in turn, to the techno-subjective restructuring of the body.

The Ganzfeld (complete or open field) effect [1] is a phenomenon of visual perception caused by staring at an undifferentiated and uniform monochrome field of color. Usually this is accomplished by the subject wearing tight fitting goggles that block out all but one colour of the spectrum. In the 1930s psychologist Wolfgang Metzger, investigating gestalt theory, established that when subjects gazed into a featureless colour field they were unable to see anything after even a few seconds. In further experiments subjects that are immersed in the monochrome field for extended periods of time consistently hallucinated and recorded distinct EEG patterns of activity.

It is a well-known phenomenon with historical precedents in the followers of Pythagoras entering dark caves to gain wisdom through visions, [2] and in reports of trapped miners hallucinating and seeing ghosts. Similar experiences are often cited by Arctic and Antarctic explorers who report altered states of mind while traveling across large featureless landscapes. It is thought that the hallucinations in extended Ganzfeld experiments are the result of the brain amplifying neural noise in order to look for the missing visual signals, and it is this noise that is interpreted in the higher visual cortex, giving rise to hallucinations.

A ganzfeld experiment is a technique used in the field of parapsychology to test individuals for extrasensory perception. In the context of ColourBlind its similarity to scrying – an ancient system of revelation through prolonged observation of an object - should be noted. Martin Howse's experiments in scrying, in so far as they relate to our electronic environment and the revelation of a hidden city [3] have a particular resonance, as does Friedrich Kittler's exposition on the electro-mysticism of Thomas Pynchon's novels. [4]

In Closed Eye Hallucination an individual sees blobs, colours in motion and sometimes objects, even though the eyes are closed. Closely linked to the experiences of subjects in Ganzfeld experiments there are often patterns discovered within the blobs – most cited are webs, grids, honeycombs and other geometric and repeating structures. CEH experiences can take a number of forms: visual noise - seemingly

random noise of pointilistic light/dark regions with no apparent shape or order; light/dark flashes - regions of intense black or bright white that appear in the noise; patterns – highly organized motion and color forming complex geometric patterns and shapes; and finally objects and things.

In the ColourBlind works a camera is turned on, and covered with a single Ganzfeld goggle [5] and bathed in a pure yellow light. The only light passing to reach the camera's CCD is yellow light of 570 nm. The video stream is sent to a computer where the input is cropped and adjusted for fall-off at the edges of the camera so that the monochrome colour field is undifferentiated by tone or hue. The camera image is processed in Max/MSP to construct a voxel volume that is analysed for optical features within a specified region of interest. Tiny inconsistencies in the colour field, invisible to the human eye, false positives if you will, are tracked as they pass across 3 planes in the x, y and z dimensions of the volume. These inconsistencies are amplified and rendered as pixels on a video plane that becomes increasingly densely populated through additive blending. These pixels are streamed to a projection on the wall. Over time patterns gradually emerge as the video frames are accumulated and multiplied together. Two other screens show in turn the light that is seen by the camera and the voxel volume of data passing across the analyzing planes.

What starts as pure noise gradually resolves itself into patterns with structure and form. Sometimes these form rapidly, but usually these are the results of layers of noise blended together over long periods of time. The patterns that emerge bear a striking resemblance to patterns that are normally associated with those seen in closed eye hallucination and Ganzfeld effect experiments in which subjects stare at monochrome uniform fields of colour.

The inconsistencies in the field come from the image sensor itself, in part thermal noise, and in part amplified background electrical noise that is present in the system, but the work suggest some other possibilities. The installation is a generative, closed system. An algorithm looks for any disruption on a uniform field of colour, which is stacked additively on previous instances of disruption. Over time there are many, many instances of the tiniest of ruptures in the visual field that together begin to organize the previously vacant colour field. These patterns are nothing more than the chance interactions and collisions of one another, but our interpretation of them hint at an analytic that forms in the interstice between machine and body within pattern and information flows, as the brain's xenophobic response to absence and randomness.

Earlier work used ideas found in *Electronic Voice* and *Video Phenomena* to explore ideas about presence and absence, and pattern and randomness. Installations took the form of blinded cameras that sent visual and audio noise to a computer that analysed it for patterns that looked like human faces and sounded like human speech.

In these installations the computer did the hard work of analyzing complex data, but the task of meaning making was left to the observer. Algorithms that found faces or human speech in the data stream found many barely meeting the requirements. The interpretation of noisy pixels as faces, or noise as speech was left to the observer.

On occasion these faces and voices were utterly convincing. They were, to all intents and purposes, real faces, real voices. They were not images of people, but another kind of image loaded with meaning, which arose accidentally, but irresistibly, from the hybrid interaction between machine and body. To all intents and purposes when these patches of pixels looked like faces, they were images of faces.

The faces and voices that emerged from the random flickerings in a machine hinted at an immaterial hybrid body that existed in the pattern and information flows that were fusion of body and machine, suggesting that there might be real information contained within the random noise of the work. Later work extended these ideas by organising noise and its visual equivalents as spatio-temporal volumes to enmesh an observer in a stack of noise slices, delivered by directional speakers. These works used pattern recognition algorithms to identify unusual repetitions, noticeable clusters, loops and so on, in concert with a moving observer who gave form to shapes and sounds. It is this work that informs the recent exploration of pattern emerging from a monochrome colour field sampled across time.

The very latest work draws upon current neurological research that acknowledges visual perception as a form of symbolic interaction in which information is gathered by the brain, but which bears no physical resemblance to the objects, and events of perception. According to VS Ramachandran, ‘...the brain creates symbolic description. It does not recreate the original image, but represents the various features and aspects of the image in totally new terms. “This activity is manifest in encapsulating behaviors and inferences, such as change blindness, selective attention, energy measurement, imagination and hallucination, in the construction of an image. The work uses images and sound conjured by machines in response to missing or incomplete information. Using the interpolation present in all media spaces to build imaginary presence, the work creates forms out of incomplete data drawn from cameras and microphones. The work looks at the possibility and consequences of invented images arising out of the discrepant and unstable representations that form our media constructed and electronically surveilled world. False positives, false bodies, false entities inhabit our media spaces, not only changing our inhabited world, but also our bodies and our being in the world.

In the work series *Doppelganger* (2011), in which interlaced image fields are separated and re-interpolated again and again until only the interpolations remain, it is possible to see how images constructed in media spaces must unavoidably generate presence from absence and how this happens through a symbiotic relationship between machine and human, suggesting in the end that there are unseen, unstable representations generated within the medium itself. *Doppelganger* creates a copy of an original made up of entirely machine–imagined data. Looking like degraded images of dolls or action figures, or twins, or Jekylls and Hydes, or merely sadder or happier version of themselves the duplicates are built on the digital DNA of the original, but have moved away from a stable state, reinvented by a machinic, algorithmic dreaming to take on a life of their own. The brain/body interpolates the absent information, filling in the missing gaps. It is possible to characterize images as contingent unstable, entropic zones. Even as the viewing subject assumes that what is viewed is a stable phenomenon, on closer inspection the image is an entropic event which is always receding, riddled with micro-discrepancies that play an important role in the construction of a world.

The work explores how images are constructed in media spaces, how absence is uniquely and unavoidably attached to presence, and how this is manifest through the symbiotic relationship between human and machine. Using the model of the *Doppelganger*—a tangible double or look–a–like, or an image of oneself possibly glimpsed on the periphery of vision, new forms, looking or sounding like someone or something, but having no index in the real world, are constructed by machines in response to incomplete data gathered by cameras and microphones.

All of the Project’s pattern recognition work has much in common with the psychic spectres of Abraham and Torok, [6] Jonathon Crary’s bodies, [7] and with recent explorations into sonic hauntology, [8] par-

ticularly in its investigation into changing ideas about what constitutes authenticity, and with earlier explorations into EVP, [9] but its lasting impact is to acknowledge an ontological anxiety that imagines a body so enmeshed with its surroundings and the technologies that support it, that it becomes indistinguishable from the mechanisms of its representation and disappearance.

Increasingly our machines see and discriminate much as we do, and in turn change our perception of the world. *ColourBlind* explores ideas about how machines and we see and experience the world, and raises questions about the capacity to discriminate between what is important and what is not. In the search for pattern in randomness, for colour where there is none, when faced with the horror vacui of sensory deprivation the brain, and in this case the machine, continues its processing regardless, creating its own colours and forms as interpretative hallucinations.

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6. Nicolas Abraham and Maria Torok, *The Shell and the Kernel* (Chicago: University of Chicago Press, 1994).
7. Jonathan Crary, *Techniques of the Observer* (Cambridge, MA: The MIT Press, 1990).
8. Since 1995, the term *hauntology* has featured prominently in the British music press and blogosphere. The first to use the term were Ian Penman in "The Phantoms of Trickology versus a Politics of Authenticity," *The Wire*, March 1995, and David Toop, *Haunted Weather: Music, Silence, and Memory*, 2004. The term has been used by k-punk, Woebot, Simon Reynolds and Pádraig, amongst others, to discuss various dubstep artists.
9. Numerous artistic explorations over the years, include the Rorschach audio project, and work by Leif Elggren, and Carl Michael von Hausswolf. *Ghost Orchid* (compiled, edited and produced by Justin Chatburn and Ash International) provides an in-depth look at EVP.

CTRL – O CONFRONTING BARRIERS TO COMMUNICATION IN INTERDISCIPLINARY PROJECTS

Linda Duvall

Artist Linda Duvall was invited by the University of Saskatchewan to curate an exhibition of student research addressing digital media. The curatorial process revealed much about the gaps between disciplines. From the beginning, Duvall noticed that each area had its own specialized and idiosyncratic language. Even more instructive were the conventions utilized by the various areas for communicating information.



Fig 1. Demonstration of the FreeForm 3D Computer Modelling System by Art and Art History undergraduate student Cory Schewaga at the opening of exhibition CTRL – O. Copyright Linda Duvall





Fig 2 and 3. Viewer in front of painting and video installation by Art and Art History graduate student Michael Farnan in CTRL – O exhibition. Copyright Linda Duvall & Michael Farnan.

Introduction

'Interdisciplinarity' is a term that had a wave of popularity in the 70s in selected academic institutions around the world. Today, it is enjoying a revival – as evidenced by this conference – but there are major problems with inserting interdisciplinary programs into discipline-based institutions. I am proposing a working model, based both on my own art practice and an exhibition that I recently curated. The model that I am proposing both values and utilizes the expertise of specialists; and allows for people outside specialized disciplines to access specialized information. I tentatively call it 'snatch and grab.'

As a Visual Artist and Academic Fellow at University of Saskatchewan, I was invited by the university's Interdisciplinary Centre for Culture and Creativity to curate an exhibition that highlighted the range of research being undertaken by undergraduate and graduate students across the Arts and Sciences programs. The intent was to show some of the research and art projects that have looked critically at the role of digital media in culture, as well as to initiate a dialog among these students and the faculty that support them.

Project *Tea and Gossip*

Before I talk directly about this exhibition, and the implications for the students, the university, and the community, I will first position myself and the structures I have developed in my own art practice.

Although I define myself primarily as a visual artist, I have always considered that I work across a few disciplines. I have degrees in English and Sociology, Education, and two Visual Art degrees. As a Visual Artist, I have worked collaboratively with people from other disciplines and much of my visual practice embodies significant aspects of sociological research. This blurring of boundaries is a crucial part of my practice. I will show one example of a project that incorporates such research into my art practice.

My starting point for the project *Tea and Gossip* [1] was a personal story of misattributed paternity. In the short narrative video that I developed, the main character did not reveal the identity of the biological father of her daughter to her husband, her daughter or the biological father, until her daughter met and started dating her half brother.

I began by showing this video to friends and neighbours; and taping their responses. I purposely began by asking a diverse combination of people, from mediaevalists to street involved youth. As I continued, I noticed that many comments took an ethical direction; so I worked with theologians from evangelical Baptists to the other extreme. I also involved people who might offer legal, psychological, or medical expertise.

In the presentation of this work, I incorporated these diverse opinions and enabled visitors to further contribute their views, both verbally during the 'gossip' sessions and on small cards. In this instance, some people's contributions evidenced their disciplinary expertise, while others approached the questions from a more personal perspective.

So, when I was invited to curate a show that crossed many disciplines, I was delighted.

Exhibition *CTRL – O*

Now about the exhibition *CTRL – O*, the title referencing the keyboard shortcut for "open file." This show presented students who were paying attention to the possibilities of new global networks and innovative intersections of the fine arts, humanities, sciences and computer sciences. These projects included analyses of social networking sites, use of new media in community building or teaching, computer modeling and simulations, and technically complicated digital manipulations such as 3D and digital collages.

From the beginning, I noticed that each area had its own specialized and idiosyncratic language. Even more instructive were the conventions utilized by the various areas for communicating information.

In areas such as Sociology and English the students included as much textual information as possible under titles such as goals, objectives, and checklists. The visual elements were clearly secondary and proposed learning was through reading the compiled information.

The Computer Science and Science students presented projects that included participatory elements such as buttons or models. Here, the learning emerged through interacting with the material presented.

The Visual Art students presented material that contained no clear conclusions, but embedded elusive personal questions. Their viewers were left to draw their own conclusions.

Context for *CTRL - O*

Now about the context for this project: the exhibition was presented in a student art gallery as part of a university wide Technology Week and was widely advertised by the institution. The opening was held on an afternoon during Technology Week, during which each student made a brief presentation about his

or her work. Then there was time for visitors to meet with the students, and for the students to meet each other. The exhibition remained up for a week.

The University of Saskatchewan has recently introduced a new Interdisciplinary Program, called the Interdisciplinary Centre for Culture and Creativity, which initiated *CTRL-O*. However, since it is a recent development, there were only two students from that Centre who were part of the exhibition. The rest were all from defined disciplines within Arts and Science. One of the main aims was to initiate dialog across disciplines.

Assessment of *CTRL - O*

It is difficult to assess whether any of the defined aims of this project were met. The students remained firmly in their own disciplines, with their means of communication clearly modeled by the departments within which they studied. However, I did a follow-up survey in which I asked the students involved about any consequences of their participation in *CTRL-O*. Several reported that other disciplines had invited them to speak.

For example one art student wrote:

After the show, Prof M. asked me to talk to his class for a bit, then I invited some of his students back to the DRC to further look at the 3D modeling [...] The show really drove home that there are more cross applications of technology out there than we know.

None had begun to work directly with other students or other disciplines and none reported that there was a mutual exchange of ideas. Rather, any interchange had taken the form of an interested person with an already developed area of research wanting to get information from the student. This is what I call the 'snatch and grab' model.

As another example, I received this email recently from a community artist:

The show you curated at the Snelgrove has directly inspired my latest sculptural work. I contacted a few of the students in the show and met with them to discuss *my idea*. Cory S. worked on a prototype drawing for me which was used as the starting point for a CAD drawing and small maquette *produced for me* by the Engineering Workshop at the U of S. [Author's emphasis.]

This is a clear example of a community artist who engaged the expertise of the students in the exhibition for her personal project.

What was also interesting about this email was that it demonstrates the fact that this exhibition provided an opportunity for members of the Saskatoon community to see what was happening at the university. It seems that community members not involved in the university – as well as faculty and students in other disciplines – have difficulty finding out about academic research. This show provided a window into the area of digital media at the University of Saskatchewan.

Further Thoughts on *Tea and Gossip*

Looking at my own project *Tea and Gossip*, I realize that I also used the 'snatch and grab' model. I began with a defined structure in place. Each participant contributed their opinions and ideas based on their personal frameworks and expertise, and inserted these into my project. They each changed the content of a project a bit, but I maintained the framework through which visitors would access the material.

Conclusions

In conclusion, I would like to make the following comments and recommendations:

1. The model of 'snatch and grab' should not be seen as a failure of an interdisciplinary program, but rather an appropriate way to transfer information. One is ensured that the person initiating the contact is receptive, since they can already see an application in their own research.
2. There is a need for a full exploration of alternative models for the transmission of research material and interesting ideas. For example the Perimeter Institute in Waterloo, Canada has wide corridors with blackboards and coffee alcoves and lounges that are conducive to making visible one's current thoughts.
3. In order to have a 'snatch and grab' model work well in a community or an institution, one needs a context in which a range of researchers/faculty/students/independent scholars/children/elders show their work/ideas outside their defined disciplines.
4. Within the academic system, one needs a way to value the 'consultants' – those who find time within their own research to contribute to the understanding of others from other areas.

In conclusion, the current institutional structures are not conducive to a total blurring of boundaries, but there are ways to open up the discourse a bit, and to nibble away at the tightness of the disciplinary framework. The exhibition *CTRL-O* is one example of an approach; and the strategy utilized to develop *Tea and Gossip* is another implementation of that model.

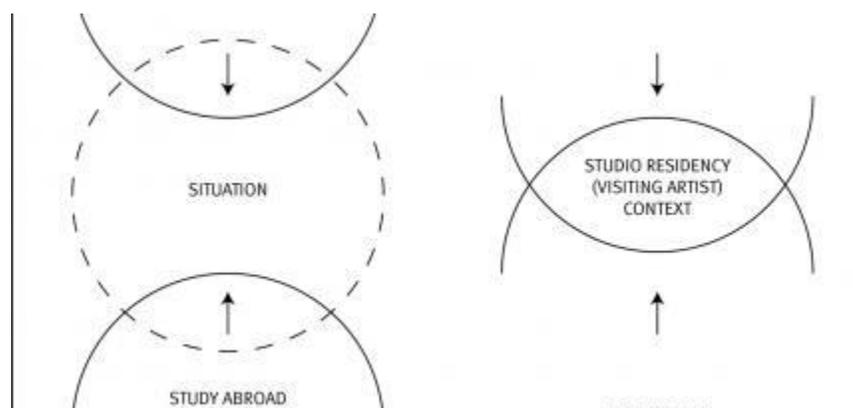
References and Notes:

1. For more information about *Tea and Gossip*, visit <http://www.lindaduvall.com/bigprojects/Visual%20Art%20Projects/gossip.html> (accessed September 2011).

STUDIO PEDAGOGY FOR SITUATED LEARNING IN THE CULTURESCAPE

VINCE DZIEKAN

This paper presents insights gained from developing studio pedagogy for situated learning in relation to the *Culturescape* study abroad program, which has been conducted for students of the Faculty of Art & Design at the Monash University Centre in Prato, Italy on an annual basis since 2009.



Culturescape's meta-learning contexts, Diagram. © Vince Dziekan.

1. Introduction

The *Culturescape* program has been conducted for students from the Faculty of Art and Design at Monash University in Melbourne on an annual basis since 2009. This study abroad program is undertaken as an intensive and immersive studio residency over a five-week period at the university's international center in Prato, Italy. The curricular orientation of the course has been designed with a focus on exposing undergraduate Art and Design students to independent practice through introducing them to the potentials for creating communication experiences that combine site-specific, location-based practices with digital image-making and creative technology. During their studio residency, participants are given the unique opportunity to develop individual and collaborative projects that respond creatively to their experiences of place, space and community.

2. Institutional Context

2.1 MONASH ART AND DESIGN

Monash Art and Design is an integrative center for socially engaged research and teaching, with a commitment to the creative enrichment and physical and cultural sustainability of our communities through visual art, design and architecture. Established in 1998 as part of Monash University, one of Australia's

Group of Eight research-intensive universities, the faculty is the university's authority in the area of visual culture.

As a collegiate community, academic staff are committed to studio teaching and research that reflects the diversity of approaches found in contemporary visual culture and the design of the built environment. While such a 'teaching/research nexus' develops from an understanding of the basis of disciplinary practices and applicable research methodologies to their fields of inquiry, the ability to foster an attitude towards the larger subject of 'practice-based research' in Art and Design is supported by the capacity to apply these forms of knowledge, both conceptually and in practice, towards collaborative and transdisciplinary contexts.

2.2 MONASH UNIVERSITY CENTRE, PRATO

Internationalization is an important catalyst for both education and research across Monash. Over the past decade, Monash Art and Design has conducted a regular series of study abroad programs at the university's key physical presence in Europe: the Monash University Prato Centre.

Located within easy proximity of Florence, the center itself occupies the Palazzo Vaj in the historic *Centro Storico* of the medieval walled city of Prato, which established itself prior to the Renaissance as an important civic and economic center, particularly in respect to the textile trade. Subsequently, the town became a leading industrial center in the nineteenth century, with Italian historian Emanuele Repetti describing it as the "Italian Manchester." As a by-product of trade and industrialization, Prato has experienced significant social repercussions from both internal and external migration. Today, the city has one of the largest Chinese immigrant populations in Italy, second only to Milan. [1] Prato, thus, provides a unique base for conducting intensive studios where Art and Design students are encouraged to respond to their cross-cultural experience of the paradoxes that abound in globalized contemporary society, while being exposed to the dominant cultural legacy of the West: the Italian Renaissance.

3. Contexts for Meta-Learning

3.1 OVERVIEW

This remainder of this short commentary article will broach some of the background and contextual considerations that inform *Culturescape's* educational approach to developing a studio pedagogy that engages with situated learning in relation to emerging creative technologies. The text will provide a general overview of how the course structure has been designed in response to its institutional and 'meta-learning' contexts by offering a series of provisional observations that reflect upon the course's pedagogical structure, project design and student experience.

According to Jean Lave and Etienne Wenger [2], 'situated learning' acknowledges how the process of knowledge is co-constructed, occurs in context and embedded within a particular social environment. Theoretically, situated learning stands in contrast to most conventional forms of teaching and learning activity where the 'knowledge' (and 'know how') is largely abstracted by being encountered out of context. Through the integration of fieldwork in and around Tuscany, complemented by active studio engagement and critique, students are provided with an expanded studio experience. This composite 'learning environment' combines a curricular structure designed to interrelate with its cultural setting

and social situation enabling them to explore their studio practices through designing creative content for emerging art and design practices, including a particular focus on 'geo-cinema' – which according to artist Pete Gomes is “the new cinema of commuting; variable and embedded in motion, locations, and fluidity.” [3]

In an educative sense, 'meta-learning' places an onus on how the learner's understanding of the learning context and the phenomenon of learning *itself* contributes towards gaining subject-specific knowledge. Described as the process by which learners become increasingly aware of habits of perception, inquiry and learning that have been otherwise internalized, [4] the concept of meta-learning emphasizes the central importance of independence to the subject of study and, more specifically, to the roles that inquiry and reflective thinking play in learning contexts. In particular, self-identity and self-development provide an important connection to the 'ontological dimension' that characterizes the nature of art and design learning where “the development of knowledge, practical skills, cognition and technical expertise, are closely interwoven with the development of feeling, perception, confidence, sense of purpose and identity, and a tangible enrichment of lived experience.” [5] In order to develop their skills in greater self-reliance, students are required to engage in meta-cognitive activities that develop awareness of both their conceptions of the subject of study and of themselves as learners in learning contexts that are comprised of “a complex array of interrelated factors.” [6] [Fig.1] As succinctly encapsulated by Tara Winters: “Meta-learning is often associated with ideas of self-regulation, self-motivation, self-reflection and independence as a learner, making it a concept of particular interest to art and design educators.” [7]

3.1.1 DISCIPLINARY (SUBJECT) CONTEXT

While available for any student in the faculty, the curriculum design of the *Culturescape* program is best suited for students situated in the middle stage of their tertiary studies in design-based disciplines in Visual Communication, Multimedia and Digital Arts; and Fine Arts students specializing in photo-based contemporary art practice. The integrated program draws upon an existing suite of units, that when so combined, support the multidisciplinary study of new media design and contemporary image arts. Briefly, the unit offerings that are made available to participants as part of *Culturescape's* integrated program include:

Digital Imaging studies in *Digital imaging* and *Digital Imaging Studio*

Digital Imaging focuses upon creative image production for a range of digital media applications. In this unit, students explore the creation, manipulation, composition and output of digital images with increasing conceptual understanding of representational issues, visual language and communication. For its part, *Digital Imaging Studio* is designed to offer students with the opportunity for self-initiated investigation of imaging approaches and digital media specialization specific to their proposed projects.

Photomedia studies in *Photomedia Fabrication* and *Photomedia Virtual Studio*

Photomedia Fabrication builds upon the skills and knowledge of photography by focusing upon creative image production through 'fabricated' photographic approaches that develop their understanding and application of lens-based photography by exploring the construction of photographic reality. Meanwhile, *Photomedia Virtual Studio* promotes the development of creative skills through a combination of analog and digital techniques, exploring lens-based and soft-imaging for print and screen-based output.

3.1.2 STUDY ABROAD (SOCIO-CULTURAL) CONTEXT

The course delivery is structured around an intensive five-week study program. In addition to attending formal studio teaching blocks, there is the associated expectation that students will thoroughly engage in independent study (both in and out of studio, through personal fieldwork and site visits) to achieve expected coursework requirements.

The following standard format has been used to guide the weekly program delivery:

Mondays are dedicated to studio work involved with the collaborative production of the assigned directed project designed to directly engage with *Culturescape's* main emphasis on locative media and relational forms of communication design. Complementing the group activities that are a feature of Monday's studio, Tuesdays are dedicated to self-directed project work over the duration of their residency. Each participant is expected to propose and negotiate a major individual project, which will come to represent their study abroad experience. This approach affords the students with the opportunity to experience what it means to work as an 'artist-in-residence.'

Formal presentations and semi-formal seminars are held regularly on Wednesdays. The nature of these lectures evolves over the duration of the course, culminating with a forum where all participants present and report on their individual project outcomes. Wednesday afternoons are set aside for short, focused excursions to cultural sites and galleries in Florence or other locations within the region. Dedicated site visits are made to major cultural heritage sites, including the Duomo di Santa Maria de Fiore, the Uffizi Galleries and L'Accademia. Complementing the attention paid to Renaissance art, special onus is also placed on visiting contemporary exhibitions curated by the Centro di Cultura Contemporanea (CCC Srozzina) at the Palazzo Strozzi.

Perhaps surprisingly, significant contemporary exhibitions have also been presented in Prato itself, as well as its neighboring town, Pistoia. Last year the Commune di Prato hosted a multi-site project by Thomas Ruff that innovatively presented works by the German photographer within the institutional spaces of its civic offices. Palazzo Fabroni in Pistoia hosted the particularly relevant exhibition: *Viaggio in Italia*, which presented a wide cross-section of works inspired by encounters with Italian life, culture and landscape produced by leading contemporary artists ranging from Carsten Holler and Thomas Struth, to Carlos Garaicoa and Richard Wilson.

Given the wealth of places to experience that are within easy reach of Prato, Thursdays are used for conducting day-trips to Bologna, Sienna, Lucca and Pisa. While cultural tourism acts as the primary focus of visits to these major regional centers, in a large number of instances these experiences provided the impetus for ideas that would become fully distilled and articulated later in studio works. Finally, Fridays are treated as 'open studio' days for independent study or fieldwork.

The routine of this regular weekly schedule has been broken by the main annual excursion to Venice for the *Venice Biennale*. The opportunity to attend this leading international cultural event showcasing contemporary art (Daniel Birnbaum's *Making Worlds* in 2009) and architecture (Kazuyo Sejima's *People Meet in Architecture* in 2010) has proven to be particularly inspirational to the students and has made a significant impression on the subsequent development of numerous individual's self-directed studio projects.

3.1.3 STUDIO RESIDENCY (VISITING ARTIST) CONTEXT

As indicated previously, the visiting artist or artist-in-residence model offers a distinctive way of describing the studio context in which meta-learning takes place in *Culturescape*. The program's studio pedagogy is put into practice through two complementary, self-supporting projects: a collaborative, directed project and an individualized, self-initiated studio project. Given the limitations of this paper, I will only expand at this time upon pedagogical considerations associated with the directed project and how this brief was used to instill an underlying sense of situated learning, that, in turn, underpins the self-directed studio projects that would eventuate.

Collaborative, Directed Project

Upon commencement of the course, the students were presented with a directed project. This brief was employed as a means of challenging the participants to give form and meaning to their initial experience of Prato, its local vernaculars and environs. Importantly, the project was collaborative in nature and emphasized the forming of social relationships at the inception of the study abroad experience. The project was used as the principal focus of creative activities over the first half of the study abroad residency; this balance switched towards individualized, self-directed studio investigation following the excursion to Venice (which has effectively acted as the juncture between these respective projects).

Thematically, the directed projects run in both 2009 and 2010 have focused on the narrative potential of communicating mediated scenarios designed to be experienced directly in public space. The assignment encourages the students to conceive of a form of cross-media storytelling that draws upon the 'psycho-geographic' features of the local environment of Prato; Psychogeography being defined by Guy Debord in his 1955 *Introduction to a Critique of Urban Geography* as the study of "the precise laws and specific effects of the geographical environment, consciously organized or not, on the emotions and behavior of individuals." The spirit of this form of inquiry is used to draw from the student's immediate subjective response to finding themselves in an alien situation; drawing out from this the meta-cognitive subject of the exercise: a knowing, self-awareness of the multi-dimensional nature of their creative practice as situated in the roles of student, tourist, explorer, ethnographer, social commentator, filmmaker, etc.

On the occasion of CS2010, the following assignment brief was issued:

Quattro Bastioni

Prato is a classic example of a medieval walled city. Referring to the map of Prato, each group is assigned to one of the four main gates or 'bastioni' that acted as main 'command and control' points of the town in the middle ages, monitoring movement by regulating entry and exit of who and what was allowed in and let out. Connect each of these nodes with another by determining three intermediate locations along a walking route. At each designated location, a specifically assigned piece of media is to be played on a hand-held portable media device. Each group determines the narrative relationship between media content and where it is to be played in situ.

The studio project was supported by supplementary lecture content and studio exercises. An introductory lecture was presented in order to establish key precepts relating to site-specificity and digital technology; portable and distributed media. The historical legacy of site-specific installation (such as Walter

De Maria's *The Lightning Field* and Richard Serra's *Titled Arc*) as well as Nouveau Realisme (which proponent Pierre Restany described as "a poetic recycling of urban, industrial and advertising reality") and Situationism were overviewed in an effort to broaden the frame of reference that the students could bring to their creative development. The currency of situated practices was supported by illustrating the diversity of contemporary works by the likes of Kryztof Wodicko and Janet Cardiff, in addition to graffiti and other forms of cultural intervention in public space including pervasive gaming.

Complementing this content, an introductory creative exercise was instigated as an exploration of photographic reconnaissance and narrative structures. Following a shooting brief whereby the students were directed to conduct a one hour photographic reconnaissance of Prato, each student was issued with a series of design challenges as a way of applying a selection of their resulting images for narrative purposes. These focused on formal principles of juxtaposition, the relationship of image and text as well as storyboarding, while narrative voice was explored through forms of first and third person perspective and dialog.

4. Concluding Observations

Through the combined contexts provided by its expanded studio, *Culturescape* places an emphasis on participants engaging in meta-cognitive activity, thereby encouraging each student to become increasingly aware of their studio learning and the context of these processes in their institutional settings and situatedness in highly context-specific environments.

In summary:

By drawing upon the subject-specific features of photography and digital imaging, *Culturescape* emphasizes the role of communication design and new media arts in the creative conception and design of cross-platform communication experiences.

Culturescape operates as a flexible learning environment that places importance on processing 'field' experiences through studio practice. The resulting 'expanded studio' draws from the visiting artist or artist-in-residence model, thereby exposing the student to aspects of independent professional practice and practice-based research.

The curricular framework of *Culturescape* transitions from directed to self-directed projects. In order to do so, the pedagogical role of a 'geo-cinema' project is used to promote attentiveness to cultural specificity and the situated nature of studio learning experience.

References and Notes:

1. According to available statistics, 10,000 legal Chinese residents were living in Prato in 2008; a figure significantly lower than the 45,000 estimated by local authorities taking into account illegal immigrants. First arriving in the early 1900s, the majority of Chinese work in businesses and workshops related directly to the garment industry. In 2010, raids on factories employing illegal labor highlighted the social and economic tensions that exist in the Pratese community.
2. Jean Lave and Etienne Wenger, *Situated Learning: Legitimate Peripheral Participation* (Cambridge: University of Cambridge Press, 1991).
3. Pete Gomes, "Being On Location: The Beginnings of 'Geo-Cinema' and 'Place Code,'" 2004, <http://www.mutantfilm.com/node/45> (accessed August 1, 2011).
4. Donald B. Maudsley, *A Theory of Meta-Learning and Principles of Facilitation: An Organismic Perspective* (Toronto: University of Toronto, 1979).
5. John Danvers, "Towards a Radical Pedagogy: Provisional Notes on Learning and Teaching in Art & Design," *International Journal of Art and Design Education* 22, no. 1 (2003): 47-57.
6. Tara Winters, "Facilitating Meta-learning in Art and Design Education," *International Journal of Art and Design Education* 30, no. 1 (2011): 90-101.
7. Tara Winters, "Facilitating Meta-learning in Art and Design Education."

DESIGNING A WAY TO VISUALIZE THE INVISIBLE THROUGH THE DYNAMIC ILLUSTRATION OF CONVERSATIONS

NATALIE EBENREUTER

This paper discusses the creation of a multi-modal data driven prototype application called the *Conversation Viewer*. Designed to visually represent the evolution of a conversation through a dynamic touch based graphical interface, it illustrates various elements of participants' email, text and voice messages as they seek to find a mutual agreement around a meeting date.

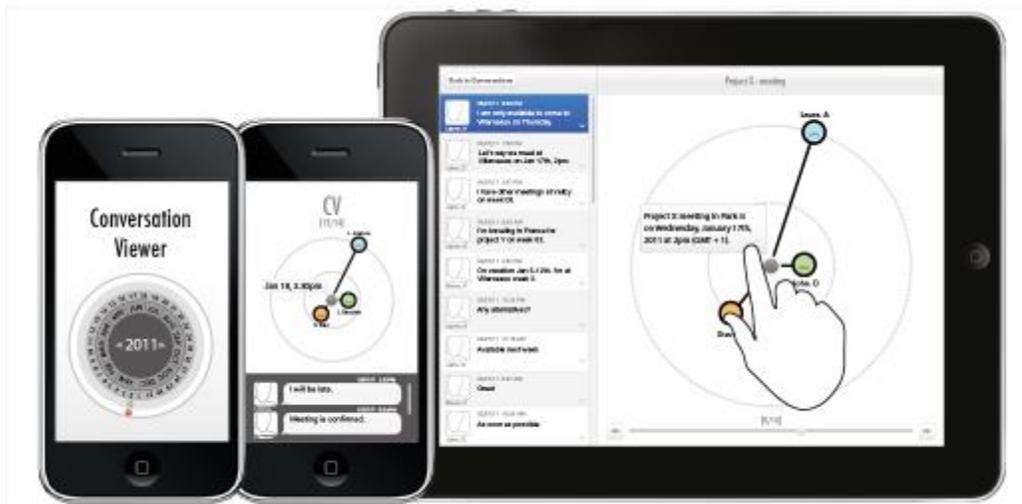


Fig. 1. *Conversation Viewer: iphone & ipad applications, 2011, Natalie Ebenreuter, graphic media, Copyright Bell Labs France.*

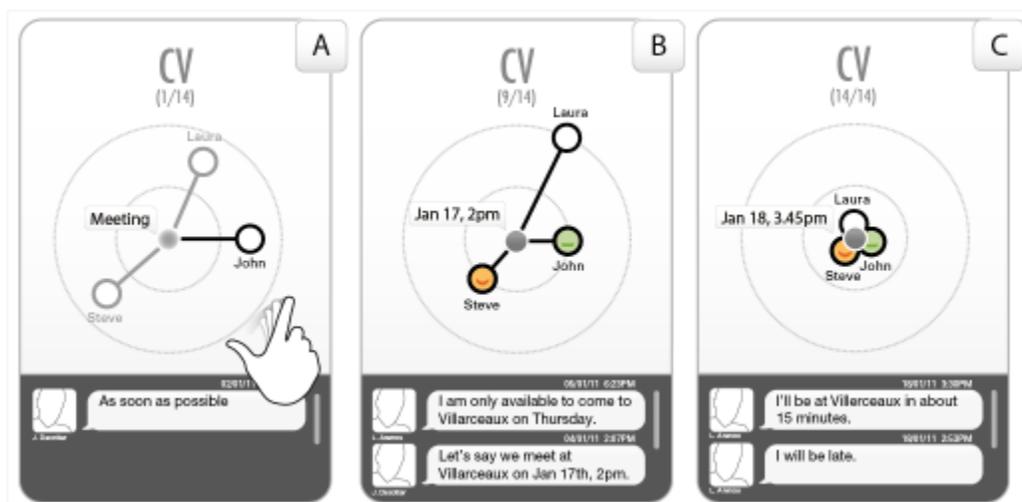


Fig. 2. *Conversation Viewer: use case scenario, 2011, Natalie Ebenreuter, graphic media, Copyright Bell Labs France.*

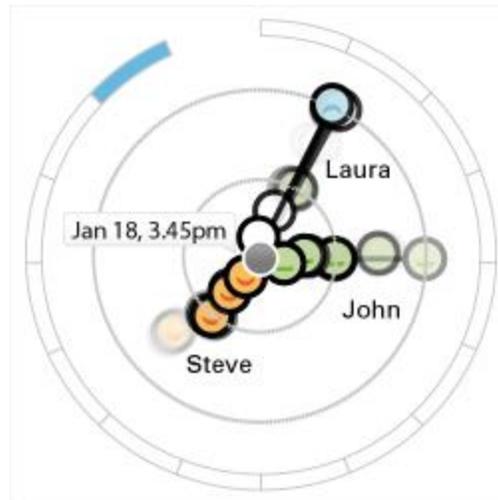


Fig. 3. *Conversation Viewer: an historical narrative, 2011, Natalie Ebenreuter, graphic media, Copyright Bell Labs France.*

Introduction

The rise of social media and the sophisticated development of third party applications, in combination with an ever-increasing range of mobile devices, makes the immediate communication of ideas between individuals, different communities of practice and the wider community possible. While we have the ability to send and receive vast amounts of information, status updates and social commentary about different events there is a need to capture dynamic systems of communication in a way that illustrates the less visible relations between participants of a conversation. This is significant to situations where the consequences of numerous interactions can change the perspective and direction of different courses of action. For example, this holds relevancy for participants in distributed environments involved in the collaborative development of long-term projects. Since digital communications commonly involve direct communication between individuals responsible for sending and receiving information, knowledge resulting from group discussions or informal corridor conversations is not as easily shared amongst participants in distributed environments via email, project documents and websites.

Rather than seeking to integrate multiple systems of communication made available through aggregation tools such as *Netvibes* [1] or *Hootsuite*, [2] this research focuses on assisting others to contextually build relations between their different communications. Here the intent is to supply individuals with a comprehensive understanding of the circumstances surrounding the progressive development of different thoughts and actions that lead to mutual agreements. This approach positions human participation, negotiation and understanding at the heart of dynamic communication systems and looks beyond the notion of interaction as the mere sending, receiving or aggregation of disparate messages. For the purposes of this research, the term 'dynamic situation' refers to a set of circumstances in which one has an awareness of their surrounding environment. In particular, this can be understood as a situation that enables individuals to understand not only their contribution to an ongoing conversation but also that of other participants involved in the same discussion.

In light of this, Bell Labs France researchers specializing in hybrid and social communication, intuitive collaboration and applications design worked together to develop a prototype application called

the *Conversation Viewer*. Its role is to make visible the abstract relations that exist between participants of a conversation. A touch-based graphical interface is used to interact with and visualize the progressive development of conversations drawn from participants' email, text and voice messages. The data driven prototype application was initially designed as an iPhone application that was later developed for the iPad (See Fig. 1).

The impact of functionality on form

The goal in designing and developing the *Conversation Viewer* was to create a way to deal with the often-fragmented experience of understanding individual and group intentions expressed by voice and text-based data. In doing so, the *Conversation Viewer* aims to provide greater awareness surrounding the overall actions and interactions of participants engaged in evolving conversations. This is where time as a factor of interaction in the past, present and future can be used not only as a reference to illustrate the history of a conversation but also to study the value of interactions.

The key function of the *Conversation Viewer* is in the utility it offers participants to interact and develop conversations. Interaction forms the basis of conversations in which elements of dynamic situations are negotiated between participants to develop a desirable outcome. The impact of functionality on the form of conversations is in the approach taken by participants during the course of interaction. It is important that understandings are not communicated; instead they are built collaboratively through conversation where participants derive meaning from their interpretation of a discussion. A new-formed understanding is then offered to participants for further interpretation and comparison to the original, which eventuates in mutual understanding and agreement. [3] In this way, it is possible to understand how the collaborative development of a dynamic situation facilitates the collective learning of different objectives between participants through a shared process of negotiation, understanding and agreement. Hence, the *Conversation Viewer* offers a means for individuals to inquire about the evolution of dynamic situations and exchange information through a series of interactions to reveal and resolve contradictory ideas.

Fundamental to this is the function of an observer as an accepted participant in the act of observing that allows for subsequent understanding from such actions to be derived. [4] During the development of interaction, individuals are accepted as mutual participants in the act of knowledge creation. In doing so different individuals, considered as observers and participants, become necessary elements in the development of dynamic situations. This in turn enables them to act subjectively. By interacting with various participants involved in conversation, understanding is created through the exchange of ideas that lead to mutual agreement. This involvement is interactive and productive so that individuals affect and are affected by the interactions in which they participate. The interaction should represent the culmination of the participant's interpretations. Significant to this is that, "The language of the conversation must bridge the logical gap between past and future, but in doing so it should not limit the variety of possible futures that are discussed nor should it force the choice of a future that is unfree." [5] This is important because the form of a system directly influences its usefulness as a tool to support the evolution and understanding of dynamic situations.

The useful and visible functions of a system

The expression of individual intentions and the broad circumstances associated with various events and actions that take place within dynamic situations underpins the useful function of the *Conversation*

Viewer. Creating a tool to achieve this becomes challenging, since there are no established interaction design patterns or use cases for the design of dynamic communication systems. Nor is it possible. The *Conversation Viewer*, therefore, seeks to provide end-users of the system with a contextual timeline of events that visually flow together with the collaborative evolution of conversations over time. Building the relations between these activities means that individuals communicating with and through the *Conversation Viewer* are not required to search through numerous email threads, text messages and voice mails to gain a quick overview of the current state of conversation. Instead, the data driven system illustrates conversations at both general and detailed levels of information in the form of a visual narrative. The 1MC Viewer also opens up the potential to express the character of individual actions or those of a group. To achieve this a technical component called a sentiment analyzer interprets the mood of an individual's communication and illustrates it in the design of the ambient interface. While applications such as the iPhone Tracker [6] provide a contextual and historical narrative of an individual's physical movements from location-based data captured by the iPhone, the *Conversation Viewer* represents a visual narrative of (1) participants' relationships towards reaching an agreement, (2) general and detailed information about the terms of agreement, as well as (3) the emotional disposition of participants during a conversation, as an organized integrated whole.

To give further context to the application's use, the following scenario briefly describes the potential interactions that could take place during the discussion, understanding and confirmation of an agreement. For the purposes of this example the terms of agreement are to find an appropriate meeting date. Fig. 2a represents the first interaction in a conversation. It illustrates a message from John in brief format that has been reduced in detail for the purposes of simplicity, as a function of the system. When touched, the message expands to show its detailed contents if so desired. At present, the agreement point is unclear, which will become more focused when a precise meeting date is proposed. Laura and Steve are represented in grey while John is represented in black, as he is the first to participate in the conversation. The participants of the conversation are positioned as neutral with respect to the agreement point. This is indicated by the background location rings in the design of the interface to help visualize each participant's relationship to the terms of agreement. As each participant of the conversation interacts with one another, their visual appearance transforms from grey to black. Simple emotions are also represented by the system's interface, based on semantic information found in each communication.

Halfway through the discussions in Fig. 2b a specific meeting date has been suggested. This is visually confirmed by the clarity of center point at the core of the agreement. Here both John and Steve are closer to the agreement due to their repositioning with respect to the location rings. We can also see that Steve is happy about this arrangement while John remains neutral to the current proposal. Finally, after much discussion the meeting is confirmed (see Fig. 2c). This is visually represented by the participants close proximity to the agreement point and its solid appearance. By presenting conversations in this way, it is envisaged that participants of the conversation can gain an understanding of their development more easily than reading or listening to each individual email and voice message that forms the basis of their representation. Furthermore, with the added functionality of (1) a global slider in a customized version of the *Conversation Viewer* shown in Fig. 3 or (2) the gestural activity of swiping along the vertical list of communications on the left hand side of the iPad application in Fig.1, an animated view of the conversation visually evolves at the same time each moment of the discussion is discovered.

Discussion

The overall purpose of the *Conversation Viewer* is to facilitate different ways of observing and participating in conversations and to offer end-users of the system greater contextual understanding of the evolution of dynamic situations. This is achieved through conversation where multiple viewpoints are expressed, visualized and internalized by those engaging in the discussion. As a result, a shared understanding of what is known from that which was previously unknown is created. Essential to this communication is that participants enter into the conversation with different perspectives and individual understandings that are distinct from any others. Given that without difference, there is no basis for exchange or discussion among participants that leads to the mutual understanding of something new. [7] Communication ceases to be productive without a context of difference or conflict to initiate change. [8]

It is envisaged that the manner in which dynamic situations can be experienced through the active engagement and manipulation of changing circumstances in the *Conversation Viewer* will assist the diverse consideration and development of mutual agreements. This is where interaction is the product of an individual's capacity to communicate, and develop an understanding of their actions with respect to the thoughts and knowledge of other participants' terms of agreement. Interaction is not considered in a mechanistic sense visualized by the re-positioning of graphical icons that gravitate toward the point of agreement in the *Conversation Viewer's* interface. For that is the resulting material outcome of interaction.

The notion of interaction in the context of this research is centered upon the actions required to reach a mutual goal. This in turn drives the purpose of communicating with different individuals through the *Conversation Viewer*; especially where the development of a conversation is as a result of a comprehensive understanding of a dynamic situation. The significance of interaction is therefore accomplished through the act of doing, which in turn enables an individual to cultivate a shared understanding of the current terms of an agreement.

Ideally, interactive products or services should offer participants, in its system of communication, the freedom to choose how they may express and fulfill their goals rather than being forced to accomplish a task by way of a limited system of interaction. This is where the idea of participating and communicating through a product or service is much greater than its physical manifestation and transcends the materiality of a product. Here the notion of an organized, integrated whole that interconnects people with their environment becomes important. Interaction in this sense is largely concerned with interconnectiveness between all the elements of the design situation. This can be graphic signs and symbols, material objects, activities, services, organizations, environments or systems. What is significant is the active participation of these elements with one another as an organized integrated whole. When all the parts of a design solution are connected, everything is in harmony. This holds significance for the dynamic treatment of a product's content with respect to the form of design outcomes; particularly in the design of products or services like the *Conversation Viewer* that seek to support the changing conditions of dynamic communication systems.

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DURATION AND DANCING BEARS: HALBERSTADT'S CAGE, INGE'S BEETHOVEN, ZIMMER'S PIAF AND PITTSINGER'S BIEBER

Chad Eby

This brief paper is a meditation on the technology and cultural resonance of duration-stretched sound.

Still sound is an oxymoron. Sound, as a vibration, is deeply intertwined with time and must move through it to exist at all. People express many of the properties of sound and music in terms of time: time signatures, cycles per second, beats per minute and so on. Unlike the visual component of motion picture film, which can be stilled to extract the atomic image of a frame, or of video, which can be electronically or photographically coaxed into forming a still image, stiling a sound effectively kills it; an oscillator cycling at 0Hz is utterly silent.

However, this dependence on time for existence does not render sound immune to the alteration and manipulation of its silent but necessary partner; instead, the manipulation of sound in time is probably as old as the intentional production of sound itself. Changing tempo for emotional effect was a common strategy in folk music around the world long before being codified in the 'accelerandos' and 'ritardandos' in the scores of European composers of the 18th century. Somewhere in the history in between, the medieval French composer, Pérotin Magister may have been the first documented practitioner of 'slow sound.' In the 12th century, Magister arranged liturgical choral music by extending the syllables of the melodic lines of well-known pieces in time and then inventing new, faster-moving lines as a sonic overlay on top of them.

It was only when technologies eventually emerged not only to describe music through notation, but also to actually record sonic events for later reproduction that a more direct manipulation of sound in time became possible. According to Caleb Kelly, in *Cracked Media: The Sound of Malfunction*, [1] by 1922, French composer Darius Milhaud was experimenting with varying the speed of phonographic turntables; perhaps earning him the title of first 'turntablist.' The comedic effect that could be obtained by speeding up a recorded sample (transforming tenors into sopranos, for instance) originating in public phonographic performances around that time would eventually blossom (or metastasize, depending on your perspective) in 1958 with Ross Bagdasarian's *Alvin and the Chipmunks*, whose accelerated vocals would go on to win five Grammy awards; three of them on the first-ever night of the event. Slowing a recording down, conversely, can evoke feelings of gravitas, sadness or even 'spookiness.' A 2007 study entitled "Does Time Really Slow Down during a Frightening Event?" by David Eagleman and his team, psychologists at Baylor School of Medicine, examined the perception of slow motion often reported in situations of crisis and found that, when sufficiently frightened, peoples' memories get kicked into overdrive, recording minutiae that would otherwise be ignored. This high density of detail in memory, when recalled, is felt as 'duration dilation.' Early ethnomusicologists, armed with decidedly lo-fi recording phonographs, often employed the practice of significantly slowing down playback for the rather practical reason of allowing them to more accurately transcribe and analyze the structure of the music, songs and spoken words they had captured in their ramblings afield. [2]

These intentional and incidental emotional effects produced by altering the playback time of recorded sound samples are due almost exclusively to the unavoidable pitch shifting that co-occurs with changes in the speed of analog playback; since frequency and speed are intimately entangled, increasing the

speed of playback of an audio recording also raises its pitch, while slowing down the playback of a recording lowers the pitch. This relationship is perfectly linear and direct: slowing down the playback to one-half speed results in the pitch of the sound dropping to one-half the original frequency. In September of 1967, American composer Steve Reich fantasized about completely severing this time/frequency relationship, which he elucidated in a conceptual score entitled *Slow Motion Sound*. The score consisted of only one sentence: "Very gradually slow down a recorded piece to many times its original length without changing its pitch or timbre at all." [3] In the late 60s, he considered this score to be strictly a thought experiment, since no readily available technology was capable of such a feat. In fact, the *Phonogène Universël*, a tape machine with a rotating play head developed three years earlier by Pierre Schaeffer in Paris, may have had some success at partially realizing the score, but Reich was apparently unaware of the existence of this exotic European device at the time.

However, even the advent of digital audio recording and playback techniques did not immediately provide the means to realize Reich's score. Basic digital re-sampling of an audio source at a different sampling rate (more or fewer slices per unit of time) does alter the speed of a recording, but also preserves the speed-frequency relationship precisely as analog techniques do. Eventually, in the late twentieth century, new digital manipulation methods finally began uncoupling this previously necessary relationship. With the emergence of phase vocoders and fast Fourier transforms (FFT) came pitch-shifting and pitch-corrected time stretching. Much as digital publishing tools had finally divorced content from presentation, these more sophisticated digital sound analysis and manipulation tools were able to separate frequency from playback speed, allowing sound to finally become 'unstuck in time.'

Four twenty-first century slow sound projects, three of which are digital in nature, and one which is thoroughly analog, may serve as an abbreviated survey of contemporary slow sound projects and provide a means for gathering common threads from recent manifestations.

The analog case is a fresh imagining of John Cage's *Organ2/ASLSP (As Slow as Possible)*. Originally written as a commissioned piano piece in 1985, Cage adapted it for the more continuous-toned organ in 1987. The piece, as the title suggests, is meant to be played "as slow as possible" while still maintaining the proportions of the overall musical structure. The duration record for the work performed by a single human is 14 hours and 56 minutes, achieved when Diane Luchese performed the piece at Towson University in February 2009. The pace of the piece was leisurely enough that she was able to take meals, between the chord changes, while sitting at the organ's keyboard. According to the February 5, 2009 article appearing in *The Towerlight Online* by Carrie Wood ("Fifteen Hours at the Organ"), Luchese also had a mechanism for reserving the nearest ladies' room so it would be available for her use when the score called for a rest.

However, even this feat of endurance pales in comparison to an especially slow version of the work now being performed at the St. Burchardi Church in Halberstadt, Germany. In this incarnation of Cage's piece, human performers are second-string; the notes on the pipe organ being sustained through the needed long durations by the suspension of weighted bags from the keys. The Halberstadt organ is being assembled, pipe-by-pipe, as new voices are required for the piece, but there is no great urgency to the construction. The performance, which began in 2001, is slated to last for over six centuries with notes changing only every few months or years. Crowds gather in the church on note change events, but the organ sounds continuously whether there is an audience or not; the accidental audience of people living nearby the church insisted that the ever-present drone be tamed, so a box of transparent acrylic sheeting was built to enclose the organ and dampen the twenty-four hour sound. Solar panels and a

back-up generator stand by to power the blowers and continue the performance should the electricity ever be interrupted.

This multi-generational sound piece, with the intended duration of 639 years, plays at the extremes of what counts as perceptible time for humans, requiring planning that may exceed seven consecutive lifetimes. However, it does not alter the actual sound *as produced* in time. The sound of the organ itself is like that of any organ and, more importantly, the transitions between notes occur exactly as if the organ was playing a short 'scherzo.' This piece, though very slowed-down indeed, does not directly relate to Reich's 1967 concept. Instead, this staging of Cage seems to point to the notion of duration itself and the kind of organization and optimism and required by humans to contemplate the launching of a project that will not even be half complete within their grandchildren's grandchildren's lifetimes.

The second work is Hans Zimmer's *Inception* soundtrack, specifically the remix (or re-synthesis) of deeply slowed fragments of Edith Piaf's 1960 recording of *Non, je ne regrette rien* (*No, I have no regrets*) used for the signature 'idée fixe' of the film's soundtrack; as well as some clever sound design strategies employing slow sound as markers for transition points.

The relationship between the Piaf song and the *Inception* soundtrack was first demonstrated via a YouTube video uploaded by user camiam321 in July 2010; which by June 2011 had been viewed over 2.5 million times. [4] Other videos soon appeared that also showed graphically how similar the structure of the soundtrack was to a slow version of *je ne regrette*. In addition, slowed down sound cues were used to sonically signal the transition points in the matryoshka-like nesting of the plot's dream levels. Each of which, in the logic of dreams, possesses its own ever-more-tightly coiled time line. Here the slowness is used almost diegetically to express the dilation of time in the upper levels of reality and the techniques employed begin to resemble the ideal decoupling of time and pitch. However, the method Zimmer uses is not so straightforward; and in interviews he hints that the slowness was more a piecemeal reconstruction than a just a slowing down of existing material.

To delve further into the structure of slowed sound, we turn next to the Norwegian Leif Inge's amusingly named *Nine Beet Stretch*. Not unlike the Halberstadt Cage piece, *Nine Beet Stretch* is, first and foremost, a conceptual piece. Inge says he was inspired by Douglas Gordon's *24 Hour Psycho*, [5] in which the Scottish media artist slowed down the infamous Hitchcock film's frame rate until it stretched out to fill a full 24-hour day. While Gordon's work was silent, Inge's most certainly is not.

By slowing down a single recording of a performance of Beethoven's *Ninth Symphony* and stretching it out to more than twenty times its usual performed length without affecting the pitch, Inge reveals a whole universe of microscopic sound and simultaneously makes good on Reich's original idea of slow motion sound. In Inge's piece, tiny sonic events that are quickly overwritten in the mind at normal speed are free now to develop, bloom, spread and skid off in uncertain decay. Close harmonies that create moments of tension in the real time of the original are transformed into long grating passages of dissonance. From my own listening experience, the melody is impossible to follow at this speed, becoming completely unrecognizable – lost both in the microstructure of sound and the failure of my attention; the extreme duration breaking down any notion of 'persistence of hearing.' Even as smaller structures come to the fore, there is an overwhelming sense of blurring, of wobblingly indeterminate beginnings and endings. One of the seeming virtues of *Nine Beet Stretch* is making the familiar strange: critical reception praised Inge for again making it possible to listen to and enjoy a piece that, for many, had become so familiar that it was no longer possible to focus on the sound. [6]

Finally, I would like to consider Pittsinger's glacially paced version of the pop song *U Smile* by Justin Bieber. Slowed down approximately 87.5% (not the widely repeated 800%!) by a piece of clever open-source software written by developer Nasca Octavian Paul and released as *Paul's Extreme Time Stretch*, [7] a software tool that both fulfills and exceeds the slow motion sound criteria and also greatly democratizes the process by putting a very sophisticated fast Fourier transform based stretching tool into a small, free easy-to-use package that requires no hardware more exotic than a standard personal computer to run.

The slow Bieber piece, originally posted by Pittsinger on SoundCloud.com, a 'read-only' sound sharing service, is remarkable mostly for huge number of auditions and comments it received. As many were later happy to demonstrate, virtually any piece of complexly structured audio (such as a carefully produced pop tune) would produce the same species of dreamy, textured soundscapes that *U Smile* did (and, conversely, that speeding up standard time dreamy soundscapes, like the work of Icelandic band Sigur Rós, did not produce Justin Bieber-like results). Perhaps the most significant effect 'Bieber 800' had, beyond giving producer Pittsinger ("Shamantis") a good deal of exposure, is that it started many smart people, including Harold Schellinx at *SoundBlog* [8] and Mark Weidenbaum at *disquiet.org* [9] (both writers to whom this paper owes a great deal) tracking backwards across the historical landscape of slow sound and thinking about the future of audio production.

The story of the twentieth century has largely been one of acceleration. From the physical (the midnight ride of F.W. Marinetti, the Bonneville flats, the four-minute mile, the V2, the Concorde, the Shinkansen and TGV, and even reaching the escape velocity of the earth itself from Baikonur and Cape Canaveral), to the informational (the telephone, satellites, email, and the web): speed was king.

But as we have emerged from the hangover of the millennial party a decade or so later, some of us once again seem to have become profoundly interested in slowness – there are movements in support of slow food, slow cities, slow design and even slow sex.

Perhaps this new-found interest in low velocity is just part of a collective fit of pique because we did not get our flying cars. By which I mean that the beginning of 21st century, so enormously pregnant with visions of the future for so long, has simply turned out to not be how we imagined it. One of our most lauded science fiction writers, William Gibson, has given up setting his stories in the future, because the present is so "science fictional," [10] an extension of his quip, quoted in *The Economist*, December 4, 2003, stated that, "The future is already here – it's just not evenly distributed." Maybe it is the case that we have optimistically leaned into the future for so long, rushing to meet its promise, that we may have run past it without recognizing it. Some of the interest in slowness now seems to be rooted in an interest in pausing and taking stock, to find, deal with and embody all of those futures that have already arrived.

Perhaps some of the interest can be understood in the context of a general breaking away from the formats and structures that have so long dominated recorded music. The temporal limits of 45 RPM, the LP, the cassette and the CD are, along with their attendant marketing and distribution apparatuses, becoming increasingly irrelevant in the time of cheap storage, psychoacoustic compression and high-bandwidth networking. With even a modest portable media player capable of storing days or weeks of music, why not have eight-hour tracks? Furthermore, as storage itself disappears into streaming cloud-based solutions, why have any limits on duration?

In a related thought, I believe the local spike in the interest in slow sound and the DIY movement are related phenomena; the popularity of slow sound may be bound up to a great extent in its astonishing generative capacity. With software like *Paul's Extreme Sound Stretch*, anyone with a computer, a little curatorial skill and the patience for tweaking a few settings can produce their own "ambient epics." [11] With the burgeoning popularity of web sites like instructables.com and thingiverse.com, perhaps the ability to say, "I made this!" will wind up being the majority of the engine behind slow sound.

The idea of the dancing bear, of course, is that everyone is so amazed that the bear dances at all, that there is no discussion of whether the bear dances well; it is enough that the bear dances. The metaphor is an indictment of the triumph of novelty over substance. The ease with which digital tools can now be used to slow down audio, even to absurd lengths, without drastically altering the original pitch is nothing short of amazing – and that it can result in engaging and ethereal textured soundscapes is bound to draw fire from those who produce similar ambient sound work 'the hard way.'

This situation is only a small part of a much larger debate about the ascendancy of the amateur and the celebration of the dilettante, which will without doubt continue long after 'Beiber 800' has faded from all but the search engine's long memories. There is certainly surprise and novelty that something as 'poppy' and heavily produced as *U Smile* could be transformed into something 'transcendent' so easily via even further manipulation. Leif Inge required the talents of a studio of sound specialists and the custom programming of esoteric audio tools (programmers sometimes jokingly claim LISP is an acronym for "Lost in Stupid Parentheses") to pull off his *Nine Beet Stretch*. *Paul's Extreme Sound Stretch*, on the other hand, produces quite good results after less than a minute's download, zero installation and a half dozen mouse clicks. Central to the idea of a dancing bear is not only that the question of the bear's dancing skill does not come up, but also the implicit understanding that the bear could not possibly dance well; we may be amused or surprised, but the bear does not reveal to us anything about dancing.

However, digitally slowed sound may have value beyond its novelty. Certainly, as predicted in many quarters, there has been a deluge of 'Beiber 800' imitators slowing down virtually any imaginable sound who will probably never touch 'slow-downing' software tools after their 15MB of fame. Slow sound, however, whether it be an expression of analog duration as in the 600 year Cage performance, or the visceral experience of using a digital tool like *Paul's Extreme Sound Stretch* to render a familiar melody irrevocably strange, can actually reveal a great deal about listening, memory, sonic emotion and our lived experience of time. If there is a bear dancing here, I would like to imagine him shuffling through a very, very slow but stately waltz.

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ART IN PROCESS – CROSS-BORDER AND BEYOND

Elisabeth Eitelberger & Bello Benischauer

This paper talks about the work by Bello Benischauer and Elisabeth M. Eitelberger: ART IN PROCESS (AIP), an Australian/Austrian entity that critically engages with a number of issues/behaviors specific to cross-cultures and consumer culture. We (AIP) develop our projects both independently and in collaboration with other artists at the intersection of installation, video and performance art.



Globalization has opened up enormous possibilities of linkages; it ideally means dissemination, diversity and insight into foreign worlds. However, other than leading to a broad perspective and enthusiasm about the various aspects of this world per se and its cultures, we must admit that – critically observed – globalization very often concludes in generalization and uniformity (shaped and dominated by Western society and lifestyle). It has become the ideal platform for broad mainstream, a playground for unquestioned fast food and monopole society. For artists, in the contemporary context, globalization can lead to the creation of diverse and specific interfaces, establishing new ways of communication and producing (collaborative) work that sets a counterpoint to the various absurd forms of mass consumption.

This paper talks about the work by Bello Benischauer and Elisabeth M. Eitelberger: ART IN PROCESS (AIP), an Australian/Austrian entity that critically engages with a number of issues/behaviours specific to cross-cultures and consumer culture. [1]

We (AIP) develop our projects both independently and in collaboration with other artists at the intersection of installation, video and performance art.

Such hybrid productions, created in-between art genres of experimental dance and theatre, visual arts, music and performance art, are elsewhere referred to and summarized as Contemporary Performance. [2]

In our case, we use new media/technology as a fusing and transmitting element to deliver and increase the transportation of an artistic message to a wider and global audience.

Some of our video/sound installations that have been the result of recent project series (addressing the growing inter-human and artistic communication through interdisciplinarity) are exhibited during ISEA 2011 – *SUEX* (2008), *Intervention* (2009) and *Emotional Seasons* (2010) – and reflect most significantly the general nature of our work from the past decade.

The exhibition and the workshop called *Born to be a Still Life* are accompanied by this theoretical presentation of our artistic practice. [3]

Within our work, we often force an interaction with the public; increasingly through the use of performance art techniques, experimenting with the art functioning outside its traditional spaces. The filmed and photographed documentation of such acts of live performances in public or private space is then used in the further development of artistic projects to finally result in video/sound installations that again can be brought back into the exhibition space (and/or are screened online). Single projects, always consisting of multiple components, are developed over one-year periods.

The recurrent use of language(s) as a strong tool in this work, intends to make people aware of certain issues through sometimes-provocative voice works that lead the audiences out of their comfort zone into a confrontation with their own, mostly unquestioned, behavior patterns. While our work is not didactic it reflects and seizes contemporary issues in our society. In all this work we aim to explore relationships between the human being and its urban/natural environment in various socio-cultural contexts, generally addressing issues related to identity and belonging that arise from globalization and/or cultural structures. Single projects address an elimination of existing distances through borders and barriers between countries, cultures and individual people. We investigate selected spaces of collective and

cultural identities through onsite projects (i.e. through AIRs) and promote art that extends into the social space, believing in the necessity of art that puts use over meaning.

Bello Benischauer, after working as an artist for more than twenty years, went global with his projects on a regular basis since his formation of AIP with partner Elisabeth M. Eitelberger, who is artistically involved and accompanies Bello on a theoretical basis. Since the age of eighteen, Bello has become increasingly interested in a combined use of diverse artistic techniques and finally set a special focus on new media – particularly video/sound installations – connecting visual images, spoken word and sound. Bello spent ten years in South and Central America, Pakistan, Iran, Nepal, South and East Africa, Indonesia, New Zealand, India and many other places in Australia and Europe, which results today in a deep connection to world-cultures and led to a special interest in the world's varied socio-cultural milieus.

Traveling and the constant aim to connect to different cultures through its people, lead to the manifestation of Bello's ideas, realized within our projects. These ideas do not refer to particular theories but are influenced by our immediate surroundings, by the media, by education; and depending on and shaped by our own individual cultural heritage/history and its multifarious, social layers. In becoming an extremely globalized world, not only the Western image of art has changed but also the exhibition space as we know it has died. Art lives now in cyberspace, it happens within the social space; it spreads out into our daily surroundings and many artistic ventures are sidetracked by less sophisticated projects, among others influenced and a result of cyber culture and social media. The French writer and theorist Nicolas Bourriaud addresses the shifting of the worldview according to developments within the arts. He describes how use over meaning in art has developed in recent years and how the Internet leads into a new direction of artistic expression. Under the term of Altermodernism (following Postmodernism) he addresses the global movement of engaging with the Internet as the main tool of expression, expanding the artist's possibilities to interact with the world instead of reflecting only on their own cultural heritage. Bourriaud refers to this global culture as the "playing field" for artists to experiment and to start building new forms of expression – influenced by and associated with the World Wide Web. He sees the human frame of mind today characterized by a global culture, dominated by exchange. In his opinion, Altermodern intends to define the actual modernity according to the specific context we live in: globalization, and its economic, political and cultural conditions. In an interview he states: "The core of this new modernity is, according to me, the experience of wandering – in time, space and mediums." [4]

Speaking about our own work, it also grows out of a reaction to the present. It translates our individual perceptions into works of art; it transmits our thoughts and feelings/emotions into an interpretive and aesthetic object (a wall-object, a video/sound installation, a social sculpture, a performance act) that becomes an artistic statement. It engages with people through the work process and the process itself becomes the main artistic outcome.

Questions like:

- a) Why has it been crucial for us to start forming international collaborations with others and to work in an interdisciplinary fashion across media?
- b) How does our work, based on surveying cultural likeness and differences in terms of identity and belonging, respond to modalities of globalization, growing urbanity and multiculturalism?
- c) How did socio-cultural issues become the main theme of interest?

... are currently under review for an artistic monograph called *Cross-border and Beyond – ART IN PROCESS until 2011*. This monograph will document the work by Bello Benischauer and AIP chronologically, complemented by philosophical reflections on single works.

In recent years, we have intensified our work methods concerning the use of languages and the collaborative aspect of inviting other artists into the process of our projects. Four of these resulting video and sound installations are shown in an exhibition during ISEA 2011.

SUEX (Sustainability and Extinction, 2007–2008), a four-wall video and sound installation, is designed to confront the audience with different voices (and languages) and asks to overcome the need to communicate exclusively through language, as well as highlighting how easily we tend to ignore what we do not know, or rather what we do not want to know. The basis for this work was an aphorism in sixteen sequences by the artist that was translated into Hebrew, Japanese and Noongar (language of Indigenous Australians, southwest corner of Western Australia) by collaborating artists. However, *SUEX* really looks for a communication beyond language (barriers) and explores instead, how individual languages can be used experimentally – just as a tune, a sound component. The four videos play simultaneously, 'speak' to the viewer and try to get his attention by building a conversational atmosphere in confrontation to the viewer. Other projects made before *SUEX* also questioned the social impact of human beings on nature through mass consumption and globally increasing population. [5]

Throughout the last century, many artists started to incorporate the use of language in their work, implementing certain/different meanings, effects and uses of language. In our case, we use language as a tool to question: Do we need to understand the words? Is there an understanding beyond our languages? In how far can we expect others to accommodate to 'our' lifestyle/cultural peculiarities and are we willing to accommodate/adjust to theirs?

In 2009, we developed an international project series called *INTERVENTION* that explored certain places and their cultural meaning through simple live performances in public. The project series was meant to explore the term of 'intervention' in its artistic meaning and beyond in different cultural environments. The places of this investigation arose as a result of other AIP activities at that time – in Austria, Portugal and Ghana. *INTERVENTION* has resulted in a book of photographs, text and a Blu-Ray Disc with video and sound installations. [6] The original English text and its translated versions in Portuguese and Fante served as a fundamental part of the sound composition. Part 1 – Salzburg/Austria questioned: How do we fit – as an individual – into a space? We investigated how reactions from the general public influenced the intervention itself. Part 2 – Évora/Portugal looked further, examining interventions that happen between people/bodies; how we interact, intervene, interfere and how we individually grow into what we finally are: individual beings, formed by culture, society and language. Explorations in the use of movement, dance and rhythm: dancers created situations together in a public space and in private – building communication through movement; addressing barriers, anxiety and cultural misunderstanding. Part 3 – Kumasi/Ghana explored human beings and their immediate surroundings to discover what actions can destroy others, or interfere with their environment. This part evolved from the discussion about creating appropriate environments for people – both in general and in particular places. It investigated how local resources could be engaged most efficiently, how art might act as a communicator to initiate real action within the social space and to overcome cultural differences. The work created in this particular context turned the word 'intervention' into a poetic experience and took the notion from a place of fear and resistance to one where it was able to evoke a sense of enrichment, enhancement and belonging.

The *EMOTIONAL SEASONS* (2010) project series was again produced in collaboration with other artists and resulted in various parts: *Christmas*, *The Cloned City*, *Not quite Kosher*, *Fool's Gold*, *Off Season* and *Internal Room*. Collaborating performances have taken place in Australia, Austria, Dubai, Ghana, India, South Korea and the United States. The series of works investigated aspects of the core theme of AIP works: how integration or exclusion is felt around particular cities and urban places. This project series generally addressed individual issues observed and experienced by the single artists about identity and belonging concerning aspects of globalization, while living in culturally diverse societies and by focusing on how they would explore/experience their immediate environment themselves in a certain, sometimes contrived situation. Questions that helped to shape the process included: How strongly are we influenced by the materialistic world we live in? How does it feel to live in a foreign (cultural) living environment and how does this affect us personally? Which layers of reality do we create and inhabit? Two of the works exhibited during ISEA 2011, *Not quite Kosher* (developed in Vienna) and *Fool's Gold* (developed in Sydney), are both based on two individual, abstract plays, we wrote for the process. The fragmented text of both plays has been used to develop performance parts in public and private environments that were filmed and further developed into the resulting video and sound installations. [7] The human body (in white clothes in *Not quite Kosher* and nude in *Fool's Gold*) was employed as the main tool to express a full range of emotions and feelings to which the viewer can relate, regardless of background, sex, education, culture, or ethnic identity.

Many aspects of media art and its ephemeral character, process orientation and its temporality have influenced our work methods throughout the years. Cyberculture and new technology increased the interest in an interdisciplinary and – within the arts – the hybrid process of crossing media once again. This is nothing new, it just appears as a new form of an old system; praising plurality over singularity. Contemporary art's perception has reached a different level. A shifting takes place: the process itself has become the object of contemplation. The artist traveler (in real and in cyberspace) explores global culture(s). Today we look beyond our daily environment. Other surroundings can extend our worldview, influence us and become an integral part within our own developing work/life. In our artistic projects we ask questions about the connection points between real- and cyberspace, asking how people's perception, how global culture – in general and specifically – influences our way of thinking and how this can be translated into works of art.

Globalization and new technologies, the Internet in particular, lead to an expansion of our worldview. Extensive developments on various levels urge us to reorganize, reshape and rename certain aspects of human existence. A constant questioning of our immediate surroundings can help us to build new solid structures and may enable us to find a new orientation within this explosively growing world, in which we have to redefine our understanding of identity and belonging.

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NEXTENSION: THE ADVENT OF THE NETWORK-SCREEN

HERLANDER ELIAS

The expansion of the current media-environment due to user-generated content, portable media and social networks has changed the very notion of citizenship. We live in a post-Web world and the network-screens are extensions, they perform as portals to digital space. This is the Next Tension.

1. MEDIACENE

There was a time when there was no media-environment. As technology became part of our culture so did media. One medium after another we have woven an entire environment out of media. It began with print and it did not end on the iPhone.

The society of our time worships contents according to their activities and hobbies. Today there is no fence separating users from programmers, culture men from technology women. Indeed there aren't borders between technology media, structures, patterns and contents anymore. Perhaps we could call it the Mediacene, the moment in history in which Man changes his environment, based on media.

This is the thing: The corporation world of the 80s and the wired world of the 90s have merged into one entity alone: a user-driven techno-cultural economy. Such new media-environment is what we may call now the "post-Web" world. Yes, the World Wide Web, the Grid, cyberspace, the Internet, provided ways of functioning and entertaining we cannot disregard. Thirty years ago everybody thought we would get inside the computer world. Twenty years ago we were supposed to interact with media by means of helmets and datagloves. Ten years ago computers were supposed to run vehicles. Today we use touch-screen media, we drive GPS-guided automobiles and we have declared war on depth with 3-D cinema. If there was a border between images and reality now it is gone for good. Augmented Reality is an example of this.

We carry several portable media with ourselves and computers update themselves on their own. We speak to our GPS interfaced cars and rely on Google Maps. This not anymore the planet inhabited by Man in the once Anthropocene age. It is simply the Earth from Google Earth, a media-feature used by Men in the Mediacene age.

Lev Manovich said once that "for the first time, space becomes a media type". Such statement is so much daring and true. Since cyberspace appeared on early videogames that virtual worlds, digital cartography and electronic mapping became a fact. Behind most of our media-environment's innovations over the last decade there is map technique. Now high-resolution maps take place because of the Web's appearance. As I have said previously, this is a post-Web world. And in this moment of history, each second counts and the clock is still ticking. Should we examine better these change we should mention the advent of the "network-screen," something only possible due to the awareness of our living in a "civilization of the screen." [1] Put another way, we may understand the whole media-environment thesis by comprehending first how instead of a screen we had a network-screen. Rather than being just a computer-portal to the Web world, screens and networks got married in the 00s following a similar trend as in the 80s computers were attached to telephones.

Wherever we are standing, the network-screen grants access to data, helps us finding things and eventually reminds us of things we once were looking for.

At the same time, the Mediocene establishes that media are futuristic, as if the imagined tomorrow is today's idea. In fact, most by-products of our time are simultaneously futuristic and rely on ergonomical designs. They're a sort of prospective concepts.

Of course it is not much to highlight that in the Anthropocene, Man is believed to have changed the landscape for good. Once we understand what is at stake in the media-environment we notice that most of things surrounding us, consumer products and images, resemble "post-relief" artifacts. After three decades of hard digitizing and databases' enlargement the desktop computer became a tiny netbook, mobile phone, a smart appliance useful for using everywhere, any time. It is getting harder to distinguish as times goes by what exactly belongs on the other side of the screen and what does not. So far maybe unfortunately we are creatures of screens. Computer after computer we have built a Matrix, a real one, a high-end computation network, a media reservoir for hybrid images, the very foundation of the computer as a "metamedium." [2] After this development a computer is not seen as a household appliance, office hardware or geek gadgetry. From this moment a computer is an open portal to a network, a vast world of data. So one should not think of Gibson's characters in *Zero History* novel as being awkward whenever they're "Decked." [3] Everyone is "decked" these days.

2. APPLIED SPACE

Our next range of possibilities in working performance and entertainment features fits in the new media-environment. Computers, networks and communication sciences become one universal recognizable entity, something every person notices on media screens, in the media space, which is an "applied space". Once a person uses software and triggers information commands, a new bridge is set between the screen-world and real-world. The space where we step in and out is an applied space, and interaction happens across media-screens, henceforth becoming limit-surfaces. As users make these media their world-center all options are set on them, every track record, each choice, all things to share and recollect. On the other hand we are witnessing a transition from a pre-digital world to a fully-digitized world. What else is left to scan and digitize? What else? Right now we are for sure living in a cyborg place, since we still know we are mostly human, modern progress believers. Yet, living in pre-cyborg places was a very different experience. You really had to be there. People connected online across the Web in their limit-surfaces try to search and be found, to collect information and to belong to a larger collective. It looks like we too have a match between the collective and the network. Yes, we have. It's called "social networks", a new 21st century phenomenon.

Our time is positioning us in a new condition, for we feel like we are hostages in a liquid present. An ever-expanding media-environment digests, changes, reconfigures any element that comes across its ventures. Multiplicity became a rule of the data world. We have to understand that in this media age reality becomes multiple. It is imperative this "multiplicity", it corresponds the endless range of options that Chris Anderson mentions in the *Long Tail* book (2007). Multiplication is also a characteristic of the media-screens, video-windows, multitasking, chat dialog boxes, and so on.

A new context is available and it forces us not to choose resignation. Choose options. Create options. Citizens are now equal to consumers, and they have to be global consumers and global citizens if they do not want to face oblivion and time standing still. Thus, we are left with two new elements: cities

have to be full of new citizens, and cities have to be global. From people's point of view a new character emerges: a citizen of the world. Greek-Hellenic culture had a term for this: *philoxenia* (love thy self, the other, and long live the art of travelling). Our sole condition is to embrace the eternal adventure, the trip into an environment where we stay in touch to our network of friends on a global level. Media change the city and society. Suddenly the urban world and the media world seem to be the same world, a "big neon city", in the gibsonian sense. After all, it is true that "cyberspace" resembles a city, and we cannot stop noticing that metropolises and sprawls look like the cyber world of rendered icons of data flowing in every direction. Digital Las Vegas, perhaps.

Evolving digital space has made many things possible, mostly customization. Users, players, workers, programmers, artists, designers and technicians opt each one for their favorite elements. Our digital world is the applied space, where applications follow user's expectations and motivations, skills and preferences. A bridge could be linking both the excess by-product of supermodernity and the customizable media-environment surrounding us.

A massive array of new brands (Google, Amazon, Facebook, Apple, Twitter, Netflix, etc) makes us more and more dependent on this applied space. Our eyes are glued to media-screens everywhere we go. Once Manovich defended that "We still have not left the era of the screen" [4] and so far it is still true. We haven't left the screen. In fact it is going that way. Some things only exist inside the screen, as a world of applications available and data do. In order to understand this applied space, one has to recall that cyberspace in the last century visionaries' jargon meant "control". Remote control. The power of the world in the palm of our hands. Working on different programs at the same time. Standing or walking on different worlds at the same time (GPS, videogames, Second Life, real world) is also a multitasking phenomenon. All this multiplicity and overlaid grid of available things to do by the new urban global IT citizen is about cyberspace.

At first, the applied space of today's iPad and smartphones is cyberspace. That is correct. Though we have to accept either that cyberspace is "whatever you view on your computer screen, the electronic geography you traverse when you are on the Web." [5] So ultimately, this is all about geography. What technology allowed us to do since 1994, on a mainstream level, is to traverse, avoid, overtake, transnational borders. Fences are rendered meaningless ever since the Web came up. Which type of space is this? Gibson himself in the text *Chaos & Cyberculture* (1994), in the interview conducted by Timothy Leary, tells us it [cyberspace] is "notional space." [6] So here we have the ground set up for the advent of the "network-screen." If there was a time in which each geography had its own screen codes, that time is long gone. "Notional space" has provided us with the tools to use the applied space of the digital age: "geographics". From Google Earth, GPS, Geocache communities, the applied space of control became "the grid", the ground upon which everything has been established upon. A major contribution about this issue is provided by Higgins, as she says that "the persistence of grids demonstrates that once a grid is invented, it never disappears." [7] Cyberspace is that grid, the Web is that grid. Something we can never uninvent. It's not technology we are discussing here. It is culture, a mankind landmark, an American product to civilization. Though one thing is still working on one hundred percent, the fact of each new media image being something where the user actively goes into. Why it happens is answered by Svetlana Boym, who believes that "the computer medium is largely tactile", not merely visual." [8] The computer tablet revolution, with their promising applications, proves to be a good applied space, and it shows how Boym is quite right about it.

3. NETWORK-SCREEN

All we know is that in 1994 the cyberpunk visions of the “datascape” became true by the hands of Timothy John Berners Lee and Robert Caillau whom have tested the HTTP communication design between servers online since 1989. Yet cyberpunk authors did amazing discoveries, they imagined how audiovisually and interactively things would be like. William Gibson admits such logic by assuming that “Well, if there’s space behind the screen, and everybody’s got these things at some level, maybe only metaphorically, those spaces are all the same 'space'.” [9] Despite the “newness” of his words, the point is that what today we take for certain this post-Web world and how we interact with the network-screen, yet it began in the 80s.

Media-environment users actually belong to this new sphere, the realm of control, they have grown or matured within a "post-Web," "post-cyberspace" world. Beyond this a new characteristic is implied in space-consumption, since space became translated to images (First Person Shooter videogames, Google Maps, Terragen software for virtual landscapes), or at least computer-generated, and that is how we became “user-players”. At the same time we play and use, we travel, work and entertain ourselves.

By staying connected to this universe all interaction depends on the user's position and his tactile skills, like typing, rotating, pinching, pressing and moving icons around. So, if it’s a question of space, digital one, and if people must be users, the network-screen is the hardware-software combination which establishes best the new interaction mode with the digital world, the media-environment.

For the very first time a culture appears, being produced by “everybody”, rather than by an intellectual and social elite, regardless of national borders or social class. Now, the network-screen provides worldwide access to a screen across networks, and that is the screen of new Web 2.0 and upcoming 3.0 brands.

People feel driven to the Web world. All there is one finds it on the Web. If one does not find it that is because it is likely inexistent. More and more students upload their CVs and portfolios online. Pictures are being uploaded to Flickr, videos to YouTube, short global messages composed on Twitter accounts. For professional reasons they are connected to LinkedIn and whenever they can they chat in Facebook, Orkut, Baboo, Bebo, Digg or Hulu social networks. All the people online together outperform small cities in terms of communication flows. Some countries are smaller than the amount of online users in some social networks. The advent of the network-screen is marked by another event, the fact of circa eighty percent of users being mobile nowadays, updating anywhere, anytime.

Cory Doctorow says that "the networks that emerge are owned by everyone and no one." [10] Digital world democratizes and then is turned into a corporate cluster. This too happens. It is a second nature what we’re discussing here, and right now it is huge. Today we need a “postmedia literacy.” Media started in the mud brick of Mesopotamia all the way to modern wax disc or contemporary PlayStation and iPads. And it does not end here. As the media-environment keeps growing, a “contiguous record”, a "continuous-memory" of the digital realm, improves our information and access to it. Network-screens are so global and relatively cheap these days that sometime we forgot a major part of Earth’s population has no access to cyberspace. Regarding the true substance of cyberspace, Boym highlights it is basically “datacentric.” [11] Judging by the amount of search engines and new Web sites, ebooks now available and so on, one may think a new type of person is needed in this data world. New media has new performances. Therefore, it changes the user and the player into a sort of “data-pilot”. The wider "networking" and "data collecting" event turns people into data-pilots. Due to this, one could invoke as well the concept of transmedia event. Is it possible to describe what exactly is going on? Yes, it’s a phenomenon of “global palimpsest”. It works as an ever-increasing space of posts, blogs and news from everybody to

everybody. Like a self-growing empire of records, in the Wiki age, and some narratives move from one medium to another. Consumers keep following them.

Today 36% of Amazon books sold are digital releases for the Kindle system. We no longer search for the news, the news finds us... Networks of news are established, people gather around contents. Communities grow upon content interest, depending on which records are published, available on the network-screens.

Our media-environment keeps increasing and turns other relatively new things into obsolete items. Online is no longer a state of digital citizens, it's a law. Nobody separates computers from networks. The digital is obviously the network. It hardly seems unlikely how for some time both things, computer and the Web, were separated. "Cloud computing" establishes this at its best.

People are looking for collective waypoints. GPS and GeoCache community and the social networks are symptomatic of this substantial problem. People gather, link, unite and move towards common waypoints. Cyberspace still is the perfect spot for sharing those waypoints. It can work out fine for sharing GPS coordinates as well as ideas, texts, pictures, designs or mathematical concepts.

Our network-screen world, our attachment to the mobile media-screens is a new thing. But what leads us into it is quite old. We need the past memories and the tribes. A man without culture is an empty vessel. Yes, we live in a screen culture, and now all screens are linked together, they are so flat that images seem to acquire more depth than their media.

It is a question of performative subjectivity too. People, subjects, perform, they share, work and function based on their convictions. It is not an objective data-based world, it's a subjective-relying network. This is our time's identity card. No one can predict anything anymore, if all that happens is recorded on the Web. As soon as the network-screen has it all, everybody around the world knowing something could trigger unforeseen consequences. The more people know something the likely change is taking place. Things become impossible to anticipate. Soon there will be not much differences except those of performativity. Performance will determine how things unfold. Based on performance one will be capable of predicting the future. This transition is better explained by Gibson, who says "We're all doing VR, everytime we look at a screen. We have been for decades now. We just do it. We didn't need the goggles, the gloves. It just happened. VR was an even more specific way we had of telling us where we were going." [12] In the aftermath of this thinking, the point is that now each network-screen is a portal, a door to the media-environment, we are before the NEXTension.

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SONIFICATION OF EMERGENT URBAN EVENTS WITH GRANULAR SYNTHESIS AS AN URBAN DESIGN TOOL

EMRE ERKAL

As the contemporary city emerges as a dynamic field, new temporal dimensions with inter-scale relationships have to be included in urban analysis and design, such as urban mobility. The auditory sense equipped with ecological psychological principles is fit for the task of tracking emergent events. An urban design tool is proposed and partially implemented in the form of a sonification environment with operative principles of granular synthesis.



Fig. 1. Movement channels of people and vehicles, Still from Videoanalitik: Eminönü Series, 2001, Emre Erkal, digital video, Copyright Emre Erkal.

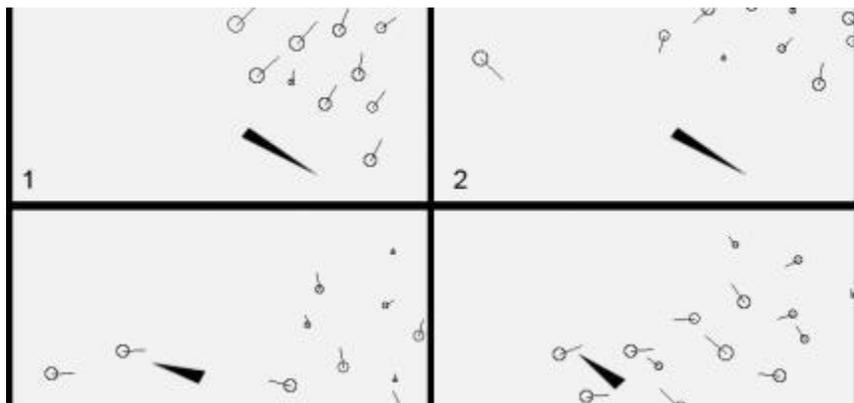


Fig. 2. Screenshots from Agents with PulseTrain, 2006, Emre Erkal, interactive Max/MSP/Jitter program. Copyright Emre Erkal.

Crisis in Contemporary Urbanism

Parallel to the increase in problems due to contemporary urbanization, it is not possible to state that today's cities are better analyzed, designed or known, all yielding to a current crisis of comprehensibility. One set of reasons has to do with the qualitative change in the urban realm, while another set of reasons arise out of the tools we try to understand our cities with.

Urbanization in many parts of the world yield to an increase in size, density and depth of cities. If megacities constitute one facet of the phenomenon, shrinking cities constitute another. In addition to this complexity, we are facing the impact of information and communication technologies (ICT's) in the urban realm. [1] For several years, it has been well-researched and understood that the relationship is more complex and ICT's and the large metropolis effect each other and therefore a more intertwined and hybrid view of space has come up. Recognition of double sided effects bring opportunities as well: these technologies might be utilized for the design of contemporary urban areas, in the form of new urban design tools.

Urban Design in Today's World: The Need for Design with New Concepts

The paradigm for Urban Design originated in 1950's architecture culture, when the capacity of public spaces in cosmopolitan city centers were questioned to be the vessels for the public sphere. Initial conceptions had more to do with devising an architectural vocabulary for symbolic identification of public space with the public sphere. However with the Team X group, urban designers concentrated on the manifest forces of publicness across a variety of urban spaces, not necessarily on 'publicly owned spaces' to begin with. Similar ideas were circulating in the zeitgeist of the post-war western circles of architecture and urbanism. Jane Jacobs analyzed the condemned urban centers in the US, and documented lively mechanisms of self-regeneration in these neglected neighborhoods. Jacobs was the first to utilize mathematical concepts of self-emergence over social networks, in fieldwork.

Since then, Castells' notion of "space of flows" and the "network society" have come to dominate urban thinking, in response to developments that can not be explained with classical notions regarding how cities work. [2] As contemporary urban design theory utilizes the concept of space of flows as the new logic of urbanism, dynamical concepts that take into analysis the flows and mobilities of people, goods, energy, money and information over what is deemed to be infrastructure become instrumental. These views take modern urbanism as complex processes playing out on complex fields over time. Relationships and links occur across many scales and vast distances.

We choose to concentrate on one such dimension: urban mobility. Barley recounts "choreographies of travel" in London, where definitions of center and edge are constantly re-emerging. [3] The physical aspects of mobility could be the indicators of forces and relationships in the social realm. Movements of crowds in urban spaces yield to the view that cities today need to be understood in terms of ever-changing possibilities. Koolhaas' work on the city of Lagos showed that the city has massive flows of people and goods in uncategorized and unregulated ways. Koolhaas' documentation of mechanisms of self-regulation and emergence begin to propose Lagos as a model for the future of urbanism in the industrialized world. [4]

As an example, seemingly unused interstitial spaces in between highway bridges act as arenas for organizing junk for re-use. Collection and dispersal rhythms of metal or tires could turn any seemingly irrelevant space into a temporary logistics center. Emerging megacities, such as Lagos or Istanbul might be illustrative of the dynamical forces of mobility, with infrastructure in formation [Fig. 1].

Tools for Monitoring Urban Change

CONTINUUM BETWEEN MICRO AND MACRO PROCESSES

If this is the future for the cities, what could be the parameters for studying and comprehending these forces of mobility? Therefore, analysis and intervention could begin with the notion of the event. Events in modern architecture theory have come to signify well-defined observable sequences in spatial configurations, yet events in contemporary urbanism are emergent singularities where novelty comes not only with re-occurrence but also with undefined categories. In other words, an event could emerge in an uncategorized way. Thus, as an event arises out of a recognition, it is a phenomenon of perception.

Mobility at larger scales signify a swarming of the individual movements and linkages; and the type of knowledge one aims to arrive at is about the large scale implications. When faced with micro-level changes in patterns of movement of people, the moment of recognition that a novel event has occurred becomes critical. Deleuze reads Leibnitz's work as he defines the passage from micro-perceptions to macro-perceptions: for him the role of perception is about the "granulation of the world and spiritualization of the world's dust." [5]

EVENTS IN ECOLOGICAL PERCEPTION

For discussing the problem of comprehension of urban intensities, a distinction could be made between model-based and event-based approaches to cities. As inheritors of classical urban planning tools, model-based approaches develop a map, an enhanced representation of the city based on pre-determined categories of inhabitation, use, linkages and event types. They are inherently ontological: the approximation of the representation is crucial to the information that can be extracted from the model/map, regarding the large scale undergoings in the actual city. Model-based approaches show a great variety: ranging from absolutist intelligent maps to computer simulations that are constructed from the vantage point of a single generic observer. However, as this observer is generic as well as the city, the model keeps it distance from the actual city.

Event-based approaches could be defined by taking the actual city and the actual observer as the departure point. As an observer in the city is part of the physical environment and the information he/she receives could be understood in terms of embodied cognition. Embodied cognition implies that information – and thus knowledge – of the actual world has to be communicated to the individual through sensory and perceptual channels that are physically coupled with the real world, as opposed to the view that observers are static receivers of sensory data. The work of J. J. Gibson in ecological perception has been fundamental for the development of this line of understanding. For Gibson, the information for perceiving events are a result of the individual's being in the environment he/she perceives. [6]

However, for developing an urban design tool, comprehension of large scale events are crucial. As an observer is limited with his/her physical existence, the problem of the comprehension of large scale

workings has to be developed with the principles of embodied cognition. Embodied cognition implies that information – and thus knowledge – of the actual world has to be communicated to the individual through sensory and perceptual channels that are physically coupled with the real world. For tackling problems of detection of events in ever-changing flows, pertinent sensory channels must be selected for conveying information. Processes of hearing has been shown to deal with temporally varying intensities better than vision.

Sonification with Granular Synthesis

ABILITIES OF HEARING IN THE EXTRACTION OF TEMPORAL INFORMATION

Sonification is a set of techniques where information is transferred with sonic elements, other than speech. Temporal nature of sound and hearing allow real-time information to be monitored constantly. The most widely known early application of sonification is the Geiger counter, a device which instantly tells the amount of radiation its sensor counts with a series of clicks: density and intensity of sound elements convey information about a landscape of ever-changing real-time data. Studies show that auditory monitoring of emerging events allows faster detection, compared to just visual monitoring or visual and auditory modalities combined. Hearing is simply more equipped for the detection of real-time change. [7]

Early sonification applications utilize musical qualities such as pitch variation in order to indicate the magnitude of change in the observed parameter. However, more recent applications try to utilize human auditory capabilities for information extraction about physical magnitudes within the physical world. Human hearing can extract information regarding the physical events that occur among physical objects in its surroundings: density, malleability and weight of objects are easily reported.

The data that needs to be sonified has to be mapped onto auditory parameters according to its dimensions. For monitoring parameters regarding change in the urban realm, issues of scale is critical. Furthermore a gradual change in parameters such as densities over a region has to be mapped gradually. In the literature there are sonification examples for geographical information which are direct translations from visualization. Zhao et al propose a four-part system: overview, navigation (zooming), filtering and details-on-demand. Performance is difficult to document, and yet the results are in accordance with other basic research that theoretically disparate dimensions such as timbre and amplitude are not totally independent. [8]

These studies show that the design of sonification becomes crucial for its effectiveness. In order for the hearing observer to make sense of the sonic input, the design of the system has to begin with auditory capacities that are to be tapped into, rather than imposed classical music theoretical categories. Trevor Wishart puts forth listening in the frequency domain, and discusses the potential in much neglected noise spectrum. Wishart is interested in the listening of a dangling telephone wire in the wind, where the sonic output is connected with the physical properties of the wire itself: its mass, cross section etc. [9] These physical parameters are directly embodied in the sound generated, and furthermore the human ear is capable of extracting information regarding these. Therefore, a natural morphology of sounds could include: crack, turbulence, wave-break, bubbles and similar physical processes.

Physiological research into auditory scene analysis, backs these holistic views. Bregman provides a framework for understanding hearing in an ecological point of view. [10] In Gibsonian psychology, event replaces sound-object as the unit of analysis. Bregman takes it further and proposes that flow is pertinent: a series of footsteps tells us about haste or laziness whereas a single footstep sound is irrelevant. Following this logic, it is plausible to propose the address the kind of hearing of layered events in sound streams, that extend across micro and macro scales. What is critical for urban fields is the capturing of dynamic morphing qualities in the continuum regarding the movement of individuals amassed. Wishart extends the analysis into group phenomena proposes streams of micro-events producing a sound landscape that is continuous across scales.

PRODUCTION OF MICRO-SOUND FOR TEXTURAL DEPICTION

One particular technique that could be instrumental in the implementation of these principles is the technique of granular synthesis. Granular synthesis is a synthesis technique devised with slightly changing micro scale sound packets produced in unison. As masses of 1 to 100 millisecond long sound quanta come together in clouds, their variations produce macroforms. Simple changes in simple parameters like the duration or the density of the granules yields drastic transitions. The potential of granular synthesis for the monitoring of the full variation in the spectrum is illustrated in the Keller and Truax study. In this study the sonic material of water drops were used as granules, and masses of these sounds were then varied in density and flow speed to fully invoke sensations along a continuous spectrum ranging from sequential water droppings to the flooding of a river. [11]

In terms of sonification, granular synthesis techniques provide an invaluable set of bricks in portraying varying textural data, such as urban fields. For implementing a sonification environment for real-time change, an observer is crucial, so that real-time intervention becomes meaningful. The more textural the granules, the more embodied will be the sensory integration for the observer.

Design Tool Implementation

THE GENERALIZED CASE

An urban design tool is proposed to track emergent events within mobility patterns happening over time. Real-time change is dynamic, yet classical planning and design tools are incapable of capturing. This proposal rests on the assertion that an operator is crucial to assess the emergence within the flows. A disembodied computer model will only be able to detect occurrences of pre-determined classes of events. For the detection of novelty, a mechanism tapping ecological perception can to be utilized.

Sonification with granular synthesis has two advantages for the task: utilization of the auditory modality for fast detection of temporal change, and micro-level granular change allowing for textural depiction of a phenomenon played out on a spatial layout. Mapping is straightforward: persons could be seen as singular moving particles, and each person's movement can be sonified in its own terms. This movement will occur in a given urban spatial configuration. With interactive parts within this configuration, an operator could make decisions and change the parameters of these moveable parts according to the emergent events she recognizes. This constitutes a feedback loop where the operator becomes enmeshed within the system she observes: in real cities these moveable parts in urban spaces do exist, however they are in the hands of security experts, not designers.

Therefore, the overall tool is conceived of in several parts: sonification of moving agents, the feedback design loop and the piping of real-time mobility data from real-time cities to provide for the agents. As the total project is an ongoing venture, the purpose of this essay concludes with the discussion of the sonification and feedback parts.

INITIAL IMPLEMENTATION: PROOF OF CONCEPT

A Max/MSP/Jitter implementation of the analysis counterpart is based on a modified version of the original Boids algorithm by Reynolds. The urban field is represented as a two-dimensional surface on which agents are set in constant motion. In the original Boids algorithm, each agent moves according to simple rules: avoiding collisions with neighbors, trying to align its speed with the speed of the group and aiming for the instantaneous group center. As all agents are on the move, the center and the collective speed is constantly changing; an ever-changing swarm of agents are simulated [Fig. 2].

In order to complete the feedback loop, a few objects are placed in the field. The operator can change the orientation of the objects. These changes bring forth more dimensions to the complexity of the system. A real-time coupling of the operator's sensorium with the chaotic system forms an embodied coupled channel, working its way through the auditory system. The emphasis should be placed on processes of hearing with granular synthesis, rather than the closure of the feedback loop. With textural depiction, changes across many scales – ranging from the micro to the macro – will be audible, and yet responsive to miniscule changes in the operator's actions with objects.

Conclusion

For the first portion of the urban design tool, an embodied feedback loop is established between a dynamical phenomenon and an operator/observer through sonification. Granular synthesis allows a textural depiction of the event landscape, the resulting sound-field is capable of portraying miniscule changes in parameters for the acute ear. There are numerous granular synthesis techniques that need to be tried out to develop an understanding of the kinds of emergence each technique is sensitive to. For example with the implemented 'pulse trains', tight convergence and staggered cross-passage phenomena were strikingly recognizable.

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BRANCHED SURFACES AND COLORED PATTERNS

JUAN ESCUDERO

A cell complex is defined in the analysis of the topological invariants of tiling spaces. In some cases the complex contains collared tiles. The representation of the corresponding branched surface can be done by assigning colors to the collared tiles. This allows to distinguish tiles with the same shape but different edge identifications.

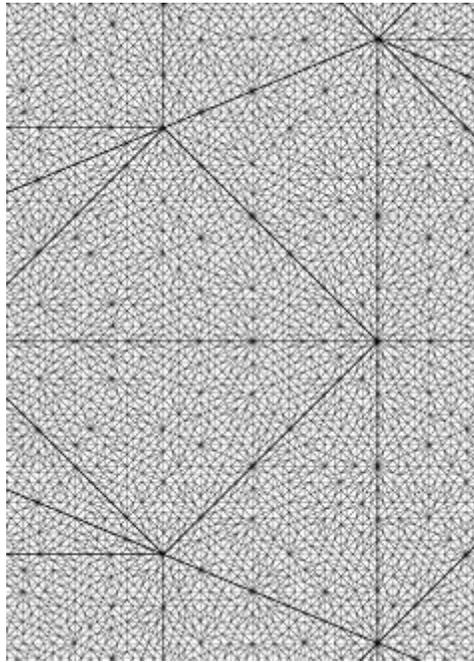


Fig.1 Level-4 supertiles for the octagonal tiling

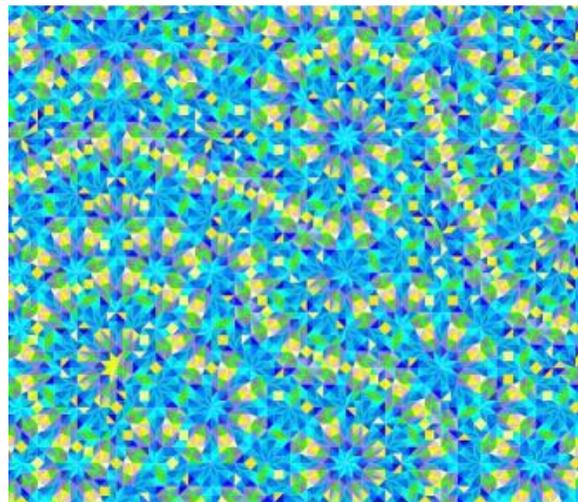


Fig 2. A fragment of "Branched Manifold"

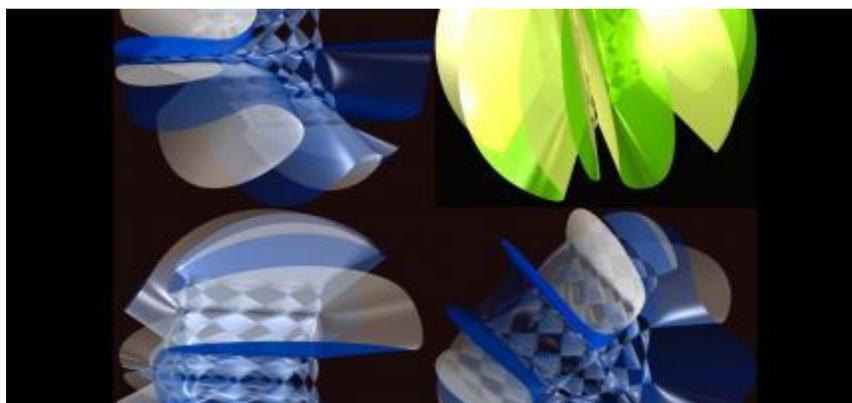


Fig 3. “Nueve y 220-A” is based on a nodal surface with degree nine and cyclic symmetry.

1.-Introduction

Artists, scientists and mathematicians share instinctive feelings about order and disorder. One of the fields where this is apparent is the mathematical theory of long range aperiodic order, because of its implications in the arts.

Aperiodic tilings are geometric objects lying somewhere between periodicity and randomness. In the 1960's Wang and Berger introduced aperiodic sets of tiles in the treatment of certain problems in logic. The question was whether or not it is possible to determine algorithmically if given a set of tiles they tile the plane. The cardinal of the tile sets was very high and examples with few prototiles were constructed later by Robinson, Penrose, Ammann, and others. Since the discovery of quasicrystals in the 1980's, the generation of ideal quasiperiodic structures has been a problem studied mainly by mathematicians and physicists.

Recently it has been suggested that aperiodic order already was present in the medieval islamic architecture. [8] Periodic and non-periodic girih (geometric star-and-polygon, or strapwork) patterns were on the basis of the designs. In particular by using certain substitutions in five girih tiles, a pattern on the Darb-i Imam shrine (Isfahan, Iran, 1453 C.E.) can be mapped into a decagonal quasicrystalline Penrose pattern with few defects. The girih tiles have the shape of the decagon, pentagon, hexagon, bowtie and rhombus. They can be seen in one of the panels of the Topkapi scroll (Topkapi Palace Museum in Istanbul), drafted by Islamic designers to transmit architectural procedures. The authors in [8] also claim that a selfsimilarity transformation, or subdivision of large girih tiles into smaller ones, was known by islamic architects.

In the 20th century, there are also many examples of non-periodic order in the arts. Xenakis, while working as an engineer in Le Corbusier's office, was responsible for the design of the undulating glass panels at the facade of the monastery of St Marie de La Tourette. Four one-dimensional tiles in golden proportion and their combinatorial distributions were the constructive units. [10] At the same epoch he employed Fibonacci series to organize the temporal sections in *Metastasis*, a work based also on ruled surfaces in the form of continuous massive glissando structures. The idea of transforming graphics into sound was elaborated by Xenakis at the UPIC system in the late 1970's.

Aperiodic order is present also in the design of more recent architecture. Penrose tilings, with tiles appearing in ten different orientations, are used in the Royal Institute of Technology RMIT and the pin-wheel tiling, with tiles appearing in all rotation angles, in the Federation Square buildings, both in Melbourne, Australia. Obviously in many cases, the use of patterns with interesting mathematical properties does not necessarily give results aesthetically appealing.

From a mathematical point of view, the appropriate space in pattern analysis is not the original surface but a folded version of it which is called the orbifold. [1] The set of points of the same kind is called the orbit of the symmetry group and the folding takes all the points of the same kind to a single point. Repeating patterns can be folded into an orbifold on some surface. The description of manifolds in two dimensions is often done by identifying some edges of simpler surfaces. Deterministic and random aperiodic tilings in two and three-dimensional manifolds have been presented in the past few years (see [5] and references therein).

There are several methods for constructing aperiodic tilings: cut-and-project methods, substitutions and matching rules. Substitution tilings grow by iteration of a set of inflation rules applied to a given set of prototiles. A tiling space can be seen as the set of tilings that locally look like translates of a fixed tiling. For the analysis of the cohomology of tiling spaces a type of cell complex is defined. [9] For each particular case the complex contains a copy of every kind of tile that is allowed, with some edges identified, and the result is a branched surface that can not be represented properly in three dimensions. A way to get an idea about it is to generate a pattern where the basic polygons with the same shape, color and orientation represent the same tile in the complex. [7] The topological interpretation is that if somewhere in the pattern a tile shares an edge with another tile, then those two edges are identified. The goal in the geometric representation is to visualize in some way the space unfolded without need of supplementary dimensions.

In the visual and sound arts, this type of constructions have potential interest as a system of reference in constrictive performing for channeling the expressive energies.

2.-A branched surface associated to an octagonal tiling space.

In a substitution tiling the pattern obtained after applying n times the inflation rules to a given prototile is called a level- n supertile. A substitution is said to force the border if there is a positive integer n such that any two level- n supertiles of the same type have the same pattern of neighboring tiles. Tiles labeled by the pattern of their neighbors are called collared tiles. When the substitution does not force the border, collared tiles can be used for the study of a type of topological invariants known as Čech cohomology groups. [9,7] In what follows I discuss how the procedure is applied to one of the octagonal tilings introduced in Escudero. [3] The study of its cohomology motivates the generation of colored aperiodic tessellations which represent branched surfaces. [6] In contrast to other well-known octagonal examples with the silver mean as scaling factor, like the Ammann-Benker patterns, this substitution does not force the border.

A vertex configuration is a set of tiles sharing a vertex. The first step in the construction consists in analyzing the dynamics of the vertex configurations. The tiling has the property of finite local complexity, which means that for some positive real number R , the tiling contains, up to congruence, only finitely many local patches of diameter less than R . Also it is uniquely ergodic, namely, it has well defined patch frequencies. In general after n inflation steps all the vertex configurations are transformed into a finite

subset. In this case it is formed by just two vertex configurations. This is the set of vertices taken to form the cell complex.

The tilings with eight-fold symmetry in [3] have four triangular prototiles represented by the letters A,B,C,D. Their edge sets are: A(a,b,b), B(g,d,e), D(g,b,b), E(b,b,z), where a,b,g,d,e,z represent the edges having lengths $2c_1, 1, 2c_2, 2c_1c_2, 2c_2c_3, 2c_3$, respectively, with $c_k = \cos(k\pi/8)$.

Iteration of the inflation rules applied to a given prototile shows that there are, up to mirror reflection, forty-one vertex configurations. After four inflation steps all of them are transformed into just two, that we label 1 and 2. This can be seen in Fig.1, where the superposition of two patterns separated by four inflation steps is shown. The vertices transform into themselves under the application of the inflation rules: 1→1, 2→2. In Figs.1 and 2 we can see both: the vertex 1 has star shape with sixteen A-type prototiles (blue), and the vertex 2 has ten A-type (eight of them yellow-green) and two of type D (green).

The edges and tiles appear in eight different orientations. By analyzing level-4 supertiles, we get the sets of possible collared tiles and edges. Having in mind the different edges and vertices we can construct a cell complex which contains 25 collared prototiles, up to mirror reflection and orientation. In order to distinguish the prototiles with the same shape we assign them colors. More than one hundred colored vertices from the forty-one initial vertex configurations appear. A fragment of the pattern representing the corresponding branched surface can be seen in Fig.2.

The collared pattern can be described in terms of formal language theory, more precisely, with the help of Lindenmayer systems. [3] The words characterize the tilings in a unique way. The word production rules are defined with the intention to describe finite patterns by word sequences as a kind of symbolic dynamical system, which is very "natural" in one dimensional substitutions like the Fibonacci sequence. In one dimension if two letters appear consecutively then the corresponding tiles appear together in the geometric representation. In order to generalize this to two and higher dimensions one has to introduce a bracket structure and the letters in the alphabet represent oriented prototiles. The allowed words in the formal language then are of the type ((ABC)(FA)(DE)). The geometric interpretation is as follows: A and B appear together in the word and there is only one way to "glue" the corresponding oriented tiles edge-to-edge. The same applies to the supertiles represented by (ABC) and (FA) or to (((word1))) with (((word2))) ... if they appear consecutively in a given word (notice that C and F will not appear, in general, adjacent in the geometric structure). A bracket belonging to the alphabet has to be interpreted not as a tile, but as a way to group tiles to get supertiles. The use of brackets mimics the hierarchical structure and it seems that they are not avoidable (without losing the result that if two letters representing tiles appear consecutively then the corresponding tiles can be glued in only one way). The model has the advantage that can be applied to higher dimensions as well.

3. Concluding remarks

In the construction of the cell complex another point of interest is to analyze the ways color can interact with the symmetries of the pattern. For a discussion of the mathematics of color symmetry see. [1] Here there is a freedom in the color selection and the final results can be very different, due to the emphasis in distinct geometric substructures. When we take into account the set of the patterns obtained by all the possible color selections we are approaching to a metaphor of the concept of rhizome which is made of plateaus. Each pattern would be an image of a plateau or "continuous, self-vibrating region of intensities whose development avoids any orientation toward a culmination point or external end." [2] Also

each pattern is related to any other pattern and can be generated starting in a limitless number of ways. There is a principle of connection and heterogeneity in the sense that any local geometric configuration appears in some other place, in fact, in infinite places when the plane filling structure is considered. The pattern is made of lines and occupy all the dimension of a “plane of consistency” following a principle of multiplicity. Each plateau here would have a strong principal unity of root-tree type because its generation is the result of successive iteration of a large set of inflation or substitution rules in a Lindenmayer system. However the whole set of colored patterns does not have this arborescent characteristic.

The basic symmetries are continuously broken and have to be perceived in a dynamical way as would be the case if temporal phenomena were embedded. There are also various levels of perception depending on the distance of observation. The image can then be seen as a kind of nomad place. While we contemplate it we travel through a space in constant change, where local configurations of just four shapes, like a ritornello, always reappear but in different surroundings. This property is preserved when we extend the pattern to infinity, but we can have a sensation of it by observing a finite fragment.

The simplicial arrangements of lines given in [5] are the basis for the derivation of non-periodic planar tilings with any symmetry. The analysis of their associated topological invariants provides a rich source of branched surfaces generation. In addition, certain families of simple subarrangements can be used for the construction of algebraic surfaces with many nodal singularities that can be represented in 3D. In Fig.3 it is shown a work based on a surface corresponding to a polynomial of degree nine obtained from one of the arrangements with 18 lines in [5] and containing the seven prototiles of a series of tilings introduced by the author in 1998. It has cyclic symmetry and 220 real nodes.

In the time domain, substitution tilings and their appearance in the field of astronomy have been on the basis of the formal procedures in several instrumental, vocal and computer generated works, where time harmonizations and sound synthesis derived from spectra of aperiodic ordered sequences play a central role. [4] One of the pieces where this techniques are present is *Yod*, for 6 percussionists and computer, performed by the austrian group Studio Percussion Graz at the 2005 ISCM World Music Days in Zagreb. On the other hand certain identifications leading to quotient spaces and orbifolds have been commonplace in musical practice. A recent work, where this and other concepts of combinatorial topology are explored as part of the precompositional materials is *Los límites móviles del agua* for two pianos, which the Ensemble Surplus plans to perform in Freiburg, Germany.

Both the visual and sound works must be regarded as projections from the same rhizomatic space. They are just manifestations of some of its infinite plateaus.

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HYBRID ART FORMS: THE WAY OF SEEING MUSIC

BILGE EVRIM ERKIN

This paper will focus on relationship between music and visual arts through the idea of hybrid art forms. Within this interdisciplinary approach, it aims to consider scientific and technological developments and the way its effects on art and perception. In this context, examples by some of hybrid art forms will be analyzed and finally compared with recent multi-media works.

Throughout the Ancient times, from Aristotle to Schopenhauer, from Pythagoras to Newton, common aspects of vision and hearing have been taken account as an interesting research field. In his passage *De Sensu*, Aristotle remarked the correlation between sound and color by encompassing physical and perceptual matters: "We may regard all these colors (all those based on numerical ratios) as analogous to the sounds that enter into music, and suppose that those involving simple numerical ratios, like the concords in music." [1] However, the analogy in physical relations between sound and vision were grounded to the ideas of Pythagoras who had depicted the musical sensory qualities related to mathematical ratios.

At the end of 18th century, physical correlations of harmonics could have been displayed by the inventions of various tools. For example, Ernst Chladni had produced his patterns with a simple system that included scattered sand onto a square plate. Chladni's patterns were occurred when this plate was bowed in certain notes. [2] Within the 19th Century, the interest of these instruments had gradually increased. French mathematician Jules Lissajous used small fixed mirrors on the sideways of small steel instrument and Sir Charles Wheatstone reflected a light beam on his Kaleidophone to produce the shapes of harmonic vibrations. Among those inventions Harmonograph is one of the well-known device that create figures of harmonic movement of pendulums.

Beside these physical correspondences between visual and acoustic harmonies, there are also remarkable interpretations vary in different standpoints. Goethe's color theory and Newton's observations on physical similarity of musical scales and seven prismatic rays of light had invoked scientific and artistic researches. In one of the early inventions of color transmission instrument 'Clavecin Oculaire', Louis-Bertrand Castel (1688-1757) modified distribution of Newton's visible spectrum and implemented these colors in to his color schema. In the half of 19th Century, new theories and applications were adapted to the instruments, such as Frederick Kastner's invention called 'Pyrophone' which was a type of gas organ and Bainbridge Bishop's device with a small display placed on the top of a classical organ that sound and its related color could be played together. However, the very-best known color organ was Alexander Rimmington's instrument, which was performed in New York, at the premier of Scriabin's 'Prometheus, Poem of Fire' in 1915.

Synaesthesia generates another common state of visual art and music. From late 19th century till the end of second quarter of 1900's, visual artists and musicians got deeply involved with this phenomenon, which is basically defined as a transition of senses. It was practiced mostly seeing the music or hearing the color of sounds. It embodies subjectivity and evokes personal associations. Like Scriabin, his contemporary in visual art Kandinsky was also inspired by this inner sense.

Artistic interpretations

Mathematical nature of harmony in music has always great influence on other art forms, such as visual arts, poetry and even architecture, which could be discussed in a wide range of interdisciplinary perspective. First of all, the sense of order, disorder and the contrast between them alter our perceptual and psychological response. [3] In music, the pleasure of order is established by tonal properties and its analogy in visual arts is indicated by perspective, which represents the vision of nature in harmony. For instance, when the tonal system was broken down by the technique of Schoenberg's twelve-tone system, the harmonic hierarchy was dismissed. This could be seen analogous in the flattened pictorial plane of paintings. However, Donald Mitchell draw a parallel between Cubism and the new architecture, on the one hand, and Schoenberg's method on the other and claim that abandonment of tonality in music and subsequent development of the serial method is well nigh simultaneous with the abandonment of perspective. [4]

Intensive interrelations between music and visual arts began to form art by responding aesthetical needs of the 20th century's worldview. Painters like Kandinsky, Klee and Kupka devoted their art to become unified with the idea of music that has the power to give expression without help of representation. Abstractness, which is considered as an essential property of music became great achievement for visual arts. Latter on, it was also determined by Clement Greenberg, who believed in independence and the purity of modernist art. For Greenberg all arts can pursue the sensuous and physical property of music. [5] Thus, in relation to other arts, music became a model; but the significance is, it should be considered as a method rather than an effect.

Greenberg's modernism is based on distilling art forms and by referring to Lessing and Babbitt; he revealed a long running idea: 'medium specificity.' On the other hand it is interesting that contemporaneously there developed new art forms and innovative experiments based on synthesis of different mediums.

Medium syntheses previously had been seen in the stage compositions like musical dramas and operas and latter in modernist period it gained new inspirations. Like in the 'Yellow Sound' (1909-14), which was an experimental piece, Kandinsky embraced all perceptual effects and blended different art forms. He turned increasingly to music by working on experimental stage compositions with Thomas von Hartmann who used music, painting, dance and lighting in his stage works. At the same time his colleague Schoenberg intensified his painting practices and stated to work on small operas. His short drama 'Erwartung' (1909) and the opera 'Die Glückliche Hand' (1910-13) revealed the same synthetic manner. Contrary to Greenberg's discriminative sense, the synthetic relations of music and visual arts could be seen as influence by Wagner aesthetics: the 'Gesamtkunstwerk' where all arts united under the banner of music.

Although in Greenberg's exclusive sense of modernism or in Wagner's unified art form, music is seen as a paradigm, as a model to define aspired 'modern' art. As Simon Shaw-Miller has pointed out in his essay 'Modernist Music', the modernist conception, has two streams developing at the birth of modernism "which are generated from music." [6] This bilateral condition of modernism stated in on the one hand 'abstract formal techniques' and on the other in 'multi-sensory' or 'multidimensional model', they can be called 'formal modernism' and 'contextual modernism', 'pure' and 'hybrid'.

Within this time period, among these stage experimenters, Thomas Wilfred conditioned himself with an exceptional aesthetic notion. He suggested a new art form, Lumia, the Art of Light, which has only light

as an independent aesthetic medium. With his instrument named Clavilux, he performed silent compositions –which were also given opus numbers like in music - controlled by a keyboard. He stated the aesthetic concept of Lumia as “The use of light as an independent art-medium through the silent visual treatment of form, color and motion in dark space with the object of conveying an aesthetic experience to a spectator.” [7] In 1920’s, when Thomas Wilfred began his experiments with Clavilux, some other artists saw advantages of film as a medium to express their abstract context. Oskar Fischinger, Walter Ruttmann, Hans Richter and Viking Eggeling, they all became aware of potentials in forth dimension. Their formalist tendency in abstract experience has broadened the essential meaning of composition, rhythm, color and the form.

It is reasonable that not all art forms are pure. Jerrold Levinson defines hybrid art forms as “art forms arising from the actual combination or interpenetration of earlier (existing) art forms.” [8] Then he goes on to categorize hybrids as juxtapositional (additive), synthetic (fusional) and finally transformational in which visual music –in the form of abstract color film- is considered as. But for Levinson, because of the transformation of music (western classical music) into abstract film is not structurally and thematically possible therefore he claims visual music as a nonexistent art form. Nevertheless he mentions that these kind of nonexistent art forms could someday exist “by appeal to radically new means and media that technological advance will make available.” [9]

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LIGHT ART IN PUBLIC SPACE

Titia Ex

Since 1991 light artist Titia Ex, has examined the value of light art in public space: its symbolic significance, referring to spirituality or the triviality of modern society. Light is a transfer of energy, an infinite potential of relationships that permanently engenders new links between things and people. Light can dematerialize public space architecture, where limits only exist on the face of things, and dissolve fixed movement patterns.

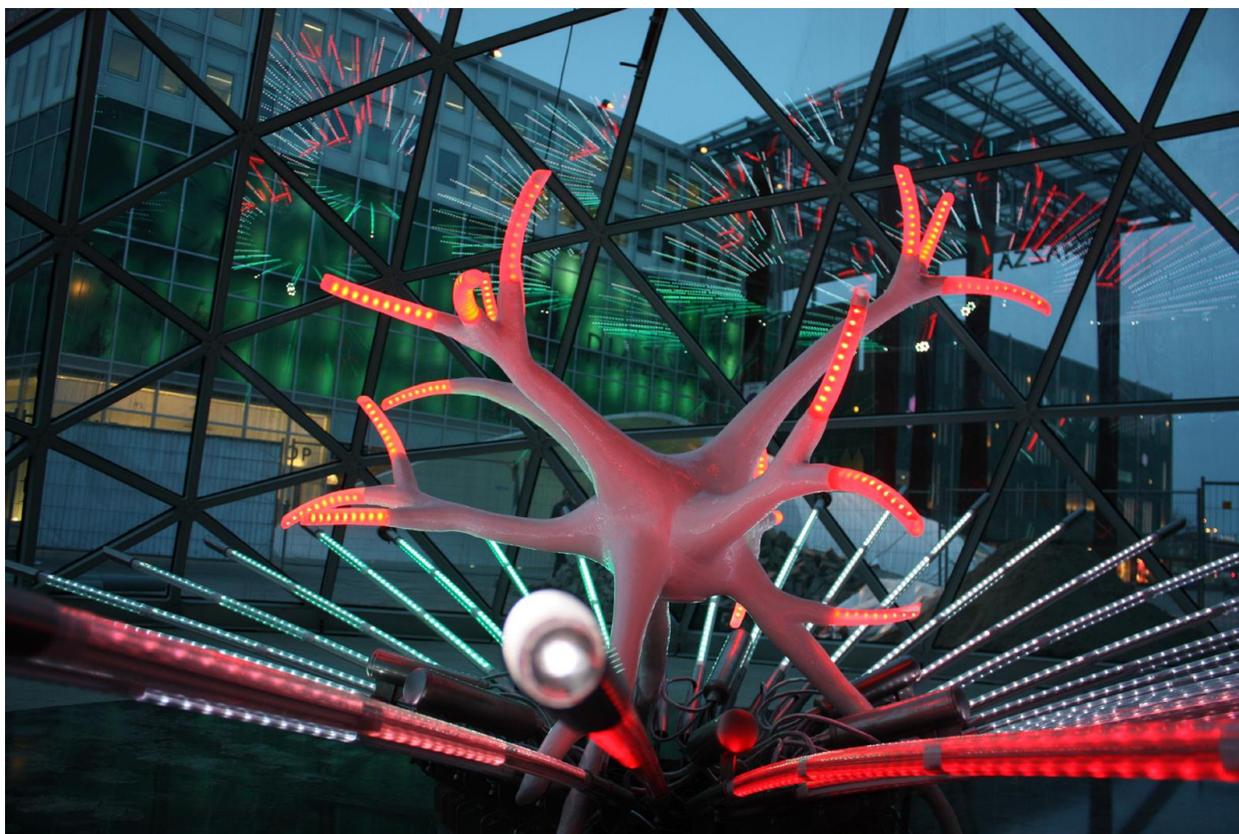


Fig 1. Flower from the Universe, 2010, Titia Ex, interactive light installation, led, diameter 17 feet, photo: Titia Ex.



Fig 2. The Waiting, 2010, Titia Ex, computer animated, led, variable dimensions, Vlieland, photo: Titia Ex.



Fig 3. Halo, 2010, Titia Ex, neon, diameter 13.1 feet, Utrecht, photo: Merijn van der Vliet.

In this paper, I would like to examine the value of light art in public space by focusing on my own practice-based field as a light artist. To me public space is a living organism. Public space is not a saturated or static space but an expanding area. The ever-changing environment has a huge impact on human behavior, on our values and our (inter) actions.

Art in public space can mirror this continuous process of interaction between people and their environment. It can draw the environment from its anonymity and establish different, new and unexpected connections, creating new perspectives on space and time and adding new relational experiences. Light

has a huge symbolic significance: it can refer to happiness, spirituality and enlightenment as much as to the triviality of modern consumer society. [1] Light art includes both artificial and natural light. Light uses time and space as material. It has a presence without presence. It doesn't merely draw attention to itself, it gives visibility to space. Light is a stimulus to our skin, body and brain.

When starting my career as an artist, I produced very short films and looped film installations, sometimes combined with slide projections. The films mostly showed inanimate objects that were a luminous presence in the real space surrounding them. They were an investigation of time and motion, often with the projector light incorporated as a visual element. The 16mm film *Still life* [2] for instance, at first shows a dining table where people have eaten. For moments nothing happens; the spectator is sitting in a dark room, looking at the deserted table, becoming impatient, when slowly the image catches fire. Apparently, you were looking at a flat two-dimensional picture of dinner party leftovers. The flat image is burning down, but turns out to be displayed on a real, three-dimensional table. The moment the spectator realizes what is happening the celluloid catches fire. The spectator remains looking at an empty – light – screen (which then turns into black).

A few years later I exchanged the celluloid surface with its accompanying light source for the transparency of glass, thus capturing the ambient light. I made large mobiles and pivoting screens: door-sized glass panels suspended in wooden frames shaped like full-size mirrors. Slides representing a geometric pattern of green dots, a detail of a plant in black and white or pictures of an empty room, images you look at without really seeing, were projected onto the glass panels. The translucent, satin-finish mobiles, consisting of etched glass discs two feet in diameter, reflected or absorbed the light, according to outside influences such as drafts and light changes. A light switch, a sink drain, a coat rack detail, familiar, everyday things you never pay particular attention to, were silk-screened on the surface in two or three colors. The mobiles created interplay between light, movement and space, both directly and indirectly. The projections on the pivoting screens added another layer to my work. Spectator participation comes when movement blocks the light when standing between the light source and the empty screen. Tilting the glass screen alters the projection and creates a reflection of the image on the wall, floor or ceiling, or makes it disappear altogether. There is no point of focus, no center left, only a continual exchange of stimuli between subject and object.

Working with light in public space is working with movement, transparency and time, all in one. It is a quest to find the rhythm - people in motion, contemplative or en route to somewhere else - and how to apply a poetic echo to this rhythm. The work is always in a dialogue with its physical surroundings and is incomplete without it. It joins the space without being absorbed by it. It makes a natural connection between space, material and viewer. Light has the virtue of reflecting on both the skin of the spectator's body and on the body texture of the environment. It has presence and non-presence. It is what the Japanese call *Ma*: the way to sense the moment of movement [3] or a simultaneous awareness of form and non-form. The word *Ma* essentially refers to an "interval" between two (or more) spatial or temporal things or events. Visitors to an exhibition do not look at *Ma*; they are touched by it and installed in it. The subject-object relationship is deactivated.

The space, the setting and the occupants of the space all supply material for the artwork. In *Musical Chairs*, [4] a permanent installation on top of a round building at the centre of a furniture mall, thirteen computer animated neon chairs in different colors switch on and off in a repetitive pattern. Unlike the children's game, it is the chairs that appear to be dancing; especially at night, when the artwork adds a festive, big city-like impulse to the monotonous architecture of the mall. There is always one chair short

in this dance, so the entire piece only exists in the mind of the spectator, who grasps its shape and character by moving around the building.

The Poet is a Cow [5] is a temporary work on the façade of the Dutch Social Insurance Bank (SVB) headquarters. The work, titled after a poem by the Dutch poet Gerrit Achterberg, consisted of a colored foil layer on a large window, representing an enormous light blue cow's head, a dark blue farmer floating in the sky along with his cow, a red and purple toddler, crawling down the dyke, a green globe with a cow's silhouette on its surface. The image relates to the Dutch landscape, flat and sky high, and the cow is a metaphor for the welfare bank. The colored foil introduced the tension of light in this white, glazed building. During the day the sun projected the image into the main hall and colored the office spaces, until the images disappeared due to passing clouds. The light installation dematerialized the space, the building became the canvas and the sunlight acted as a brush. Visitors to the building became part of the predominantly violet light landscape in the hall, and when using one of the glass elevators they became immersed in the huge cow's head. The intervention of the work very gradually affected the people working in the institution. In time, they discovered that the reflection of the colors also entered the offices, coloring their papers and walls. This "color bath" put their environment in a different perspective. People became aware of the physical light and space, and their own movements, and felt more unified with the architecture and surroundings.

Another example is *Halo*. [6] A permanent light circle, diameter 13 feet, floating above the crest of the lower chapel of the Roman Catholic Church Saint Willibrord in the city of Utrecht. The church was built in 1877, a time in the Netherlands when Catholics were again able to express their faith by building new churches. The entrance is humble, in a residential street with small shops, the church disappears out of sight, is invisible. The work of art establishes a link between the church and its surroundings; the silent gesture taking the church out of its shadow. The circle of light – comprising two neon lines, a golden yellow inner circle and a pure white outer circle – is both dynamic and static, it connects the space to a human sense of history. The intensity of the light in the artwork draws your eyes upwards only to disappear into the black hole, experiencing another dimension of space in the city.

Last year I made *The Waiting*, [7] a site specific, computer animated installation during the contemporary music and art festival *Into The Great Wide Open*. 'The Waiting is the hardest part', is a song by Tom Petty, who also wrote *ITGWO*, the festival's title song. The work comprised forty red LED lights that float just below the surface of a pond and blink randomly, short – long – short. The spectator's close attention was drawn by the continuous random blinking; endlessly waiting for a pattern never to emerge, knowing all was there. The unreadable rhythm of this atmospheric lighting evoked a sense of infinity and a sense of life, an effect that is disconcerting and exhilarating at the same time.

This layered thinking in associations and references is a recurring element in my work. Neither the object itself or the beholder is most important, but the very moment at which everything converges. My installations, computer animation works and video loops seek a balance between this elusive border area at the edge of human thinking and a plain understanding. I wish to create a personal, intimate moment, preferably in a dynamic field of the public domain. This notion is strongly reflected in the interactive light installation *Flower from the Universe*. The installation is always in the present, like a real living, biological plant, [8] unfolding the moment.

Flower from the Universe is a gigantic light flower, seeming to float above the surface, with a heart modeled on a nerve cell, encircled by a garland of graceful stems. A circle of seven pods lies under the heart, and in here the seed of movement is hidden. By walking around the artwork, the visitor sets off a wave

of moving colors. The flower records the colors surrounding it and transfers these to the “petals” - group of stems - into which the garland is divided. Near the borders between the petals, the reflected colors gradually fade into one another. The nerve cell in the heart has illuminated offshoots that follow or are in contrast with the colors in the garland. A dynamic interplay is created with both the viewer and the surroundings influencing the light flower.

This object works using sensors and specially developed software that controls the LED lights in the stems and the offshoots of the nerve cell. Without the external stimulus, the offshoots will switch over to internal control. The principle behind it is physical space. Space as a palette, as a biotope: a living organism. The context changes continually, viewer and light sculpture intermingle and connect, and together are incorporated into a unity of time; there is no beginning or end. _

The *Flower from the Universe* has been exhibited at various locations, [9] including a pond in a botanical garden and the hall of an immense “blob”: an organically shaped glass structure designed by Massimiliano Fuksas. At each location I noticed how people responded to the *Flower* and what impact light can have. Using their bodies, mindful of or attentive to their environment. There is no rational model that allows us to foresee how it feels to play and experiment like this with color. The identity of a color does not reside in the color itself, but is established by relationship. [10] Colors present themselves in a continuous flux, constantly related to changing neighbors and changing conditions. In no reliable sense can we speak of color “as it really is”; it is always determined by its context. A diverse public of all backgrounds and ages were fascinated by the chance color of the moment, became absorbed in the work and mingled with other passers-by. They actively collaborated, interacted with each other, played and blended into their environment.

I like the complexity of working with light in public space. Each context is different, changing the perspective of perception and memory. Light can pass borders; it can fill a space in an instant and be gone the next moment. Light can convey both the dynamics of a space and its tranquility. It can establish an intercourse between several dimensions with a diversity of actors, involving the spectator’s sensory experience.

The Danish light artist Olafur Eliasson works with sensory experience using natural phenomena. He creates an ongoing exchange of stimuli between the visitor and the space. Like *Your rainbow panorama*, [11] 2006-2011, on top of the Aarhus Kunstmuseum, a permanent elevated structure with a 360° view of the city of Aarhus, Denmark. Suspended between the city and the sky, the viewing platform insists on the sensory engagement of those who enter it walking through the colors of the rainbow, from color to color. The USA light artist James Turrell usually encloses his audience in order to control its perception of light and make it lose all sense of space, scale and color, like in the series *Skyspaces*, [12] built at several locations, a number of architectural installations with holes in the ceiling to look through at the sky, meticulously designed in order to heighten the viewer's awareness of light.

The present state can also lodge the past. Currently, I am working on a new temporary project in public space; it is partly virtual and entitled *Walking the Light*. It is about attachment to a place, recollection and transformation. The work draws the public space out of its anonymity and forms different, new, unexpected connections. It will entail walking a light circle in an urban landscape led by virtual light guides carrying torches while telling their stories. It will reflect the public space in a poetic manner, evoking a sense of belonging.

Artificial light is an expanding field bearing innovations within the scope of architecture, health care, and the quest for mobile and sustainable light systems. Light facades; the public space; innovative employment of light as a stimulating impulse to our bodies, in light therapy and brain activation methods; mobile light sources, like LED, making it possible to wear light on the body; and sustainability solutions, allowing spaces to be lit in a cost-neutral way.

Art reflects who we are, and what really matters to us. Light art in public space doesn't begin and end in a physical frame. Light is a transfer of energy, an infinite potential of relationships that permanently engenders new links between things and people. With light you can dematerialize the architecture of public space, where limits only exist on the face of things, and dissolve fixed movement patterns. Public space, not as a passageway, but as the place where life is lived, amidst historical tokens, rediscovering or redefining the environment from a new dynamic perspective. Light art can contribute to the present, to the relational experience of a place, to a general consciousness of being in a public place. The Dutch poet Rutger Kopland interprets this exquisitely as *An empty place to stay*. [13]

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ART, TECHNOLOGY, AND INSTITUTIONAL DISCOURSE

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This paper and talk ties together current innovation policy initiatives that incorporate the arts into their programs, before arguing in support of more complex understandings of the relationships between art and technology.

Recent structural changes in Western industrialized economies include the establishment of the knowledge economy, competition from emerging nations in the manufacturing sector, economic crises, and grand scale challenges such as climate change. National leaders are seeking to support the development of new economic sectors as a response to these circumstances. This has led to a focus on innovation economies fueled by increasingly rapid technological change. In this climate, creativity and technological innovation are seen as correlates to a competitive economy. At the same time, art has shown its capacity to engage with high technologies through a critical mass of technological art visible in exhibitions, public interventions, symposia, and specialized academic programs. This paper ties together current innovation policy initiatives which incorporate a spectrum of roles for artists. It then argues in support of more complex understandings of the relationships between art and technology.

European Innovation Policy

Millennial European Union (EU) innovation policy exemplifies the shift from conventional technoscientific industrial research and development (R&D) initiatives to those incorporating a focus on creativity as a driver of innovation. In March 2000, at the EU Heads of State and Government meeting in Lisbon, national leaders set an overarching goal to make the EU “the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion” by 2010. [1] The policy supporting this objective is known as the Lisbon Strategy. One of the main goals of this ten-year economic plan was for government, university, and corporate R&D spending to reach 3% of gross domestic product in each of the member nations. Throughout the first half of the Lisbon Strategy years, we see strategic guidelines, such as the communication *More research and innovation*, [2] which correlate economic objectives and institutional R&D. The shift to a rhetoric emphasizing *creativity* and innovation in addition to institutional R&D is apparent in the 2008 Council of the European Union communication, *Council Conclusions on Culture as a Catalyst for Creativity and Innovation*. [3] Here the Council promotes a broader understanding of innovation and recognizes the contribution of the arts and culture to foster creativity. Overall, EU communications throughout the decade 2000–2010 show a shift from institutional R&D toward a vision of an innovation economy emphasizing creativity as a key resource in the new economic environment.

This change in the concept of innovation is due in part to a shift in profitability from the manufacturing sector to the creative industries. While traditional manufacturing industries in Western countries suffered external shocks such as the rise of industry in emerging nations, the knowledge-based creative sectors were resilient. According to a 2010 United Nations report, despite the 12% decline in overall global trade, world trade of creative goods and services increased by 14% between 2002 to 2008. [4] A recommendation in the same report suggests that “Policy strategies to foster the development of the creative economy must recognize its multidisciplinary nature — its economic, social, cultural, technological and environmental linkages.” Here the ‘creative economy’ refers to a loose intersection of the arts,

culture industries, business, and technology, particularly digital technology. In this thinking, economics are explicitly linked with creativity, technology, and human social and cultural development in the sense that the ability to create and circulate creative intellectual capital can produce income, jobs, and export earnings. Artists working commercially in the creative industries are typically configured as contributing aesthetic assets, whether it be digital assets, storytelling, music, or product design, for example.

The later Lisbon Strategy years saw the 2008 economic crisis as well as the European Year of Creativity and Innovation, 2009. The role of this initiative was to highlight innovation and creativity as a response to the global downturn. Prioritizing creativity and innovation in conjunction with the knowledge economy represents a transition from the mindsets, practices, and divisions of labor that determined success in the industrial economy toward an economy where creativity, entrepreneurship, knowledge resources, skills, and expertise function in an interconnected, globalized economy running on a combination of information and know-how.

The shift in policy rhetoric from industry-focused research and development to creativity-fueled innovation brings the arts into innovation discourse. In preparation for Europe 2020, the next European economic framework following the Lisbon Strategy, 75 experts at the “Towards a Pan-European initiative in support of innovative creative industries in Europe” workshop, wrote the Amsterdam Declaration of 5 February 2010, which stated:

Beyond their contribution to cultural diversity, creative industries represent indeed a great economic and social potential. In order to take full advantage of this potential, there is a need to combine arts and creativity with entrepreneurship and innovation. These industries are not only a source of inspiration but represent also an enormous asset to be turned into competitive advantages and the creation of new and better jobs in Europe. [5]

The relationship between the arts and innovation in this discourse is supported in part by the associative relationship between the arts and creativity, and creativity and innovation. Other discussions of the role of art in innovation policy configure “humanistic” contributions of the arts:

Art and culture can make a vital contribution to the achievement of objectives that reconcile wealth creation with sustainability and respect for common humanist values because one of the features of art and culture is that they help us to transcend purely economic or utilitarian constraints. [6]

In these examples we can see various configurations of the artist within the new innovation initiatives. Many of these initiatives situate artists in terms of potential aesthetic, creative, and humanizing contributions to the central project of technology development and innovation; however, there are EU-related projects which configure artists as more centrally involved in the development of technologies and innovation processes. For example, INNO-Grips is a project of PRO INNO Europe, a research agency that supports European policy. Their report titled *Innovation Unbound: Changing innovation locus, changing policy focus* positions artists in multidisciplinary innovation labs along with engineers, architects, designers, sociologists, businessmen, and policy-makers. [7] INNO-Grips sets forth a vision of a network of multidisciplinary and interdisciplinary innovation labs supporting Europe as the “global innovation leader in effectively addressing complex social, environmental and economic challenges through sustainable, human-centered and democratized innovation.” In this vision, these innovation labs “create and support the combination of social, scientific and artistic disciplines.” [8]

Two programs existing independently of the EU policy framework also place artists centrally within the innovation team. Disonancias is a Basque organization supported by the corporate Xabide Group and the Basque government. Disonancias places artists in companies, research centers, or public institutions to work along with members of these organizations on innovative projects. Disonancias promotes the capability of artists to “propose new and different innovation paths, introducing detours and dissonance into the usual processes of thought and action.” Disonancias puts forth the view of artist-mediated innovation “not as an end in itself, but as a tool to change ways of acting, attitudes and values, beyond that of economic benefit.” [9] Disonancias was chosen as a Best Practice Case in Creativity and Innovation by the European Year of Creativity and Innovation program.

AIRIS is a similar project initiated by TILLT, an organization formed by the region of West Sweden in 1973 as a platform for collaboration between artists and businesses. Under AIRIS, artists join a company for ten months of collaborative project work. The AIRIS project has three main goals: “to create an interface for interaction between industry and the culture sector, to enhance the creative capabilities of industry with regard to a specific business development goal, and to create new employment opportunities for professional artists.” [10]

Creative Clusters

Creative clusters are cities or regions that combine related industrial, small business, or other economic practices. The notion of a creative cluster leverages the idea that through networking and cross-pollination, a creative cluster can be synergistically greater than the sum of its parts. Localization and sense of place are central to the notion of creative clusters, and cultural and artistic presence within the cluster is seen as desirable for community-building. Discourse and initiatives supporting creative clusters configure a spectrum of roles for artists. For example, Digital Media City in Seoul, Korea was established by the city of Seoul on the site of a massive landfill to be the center of Korean broadcasting, music, film, computer game, e-learning, and other digital media-based industries. Commercial artists are employed by the digital media industries, and fine artists are commissioned to create public art. The rationale behind welcoming artists and allocating resources for public art is to support placemaking. [11] The presence of art and artists is considered to play a role in creating an environment which attracts a mobile, highly-educated, and skilled workforce. [12]

Kortrijk, Flanders has a long history in the textile industry. Rather than face economic decline when textile manufacturing moved to Asia, Kortrijk reconfigured itself as a cutting edge design region, Designregio Kortrijk. Thanks to funding in part by the City of Kortrijk, a large abandoned textile factory is being transformed into Buda Fabriek, a physical location as well as project platform for artists, designers, research institutes, students, and businesses to come together and share knowledge about artifact development, new materials, and innovative applications. Supporters see Buda Fabriek as necessary physical infrastructure to create a substantive intersection between artists, the economy, innovation, and development. The goal of Buda Fabriek is to make its locale, Buda Island, into the cultural and artistic node of Kortrijk, thus building a creative cluster within a creative cluster.

Silicon Valley in the United States is often cited as an example of a successful creative cluster. While Silicon Valley innovation depends in part on the dense concentration of technology specialists who can readily interact with each other, there is a parallel cluster of technological artists. Formal contact between artists, scientists, and technologists has come through artist-in-residence programs at Xerox

PARC, Interval Research, the University of California at Berkeley Space Sciences Laboratory, and the Exploratorium, a San Francisco science museum. Informal cross-pollination occurs between Silicon Valley and nearby San Francisco Bay Area artists and technologists through festivals such as the Zer01 San Jose Biennial and Maker Faire, an annual art, engineering, science, and DIY (do-it-yourself) exposition and networking event. There are accessible and well-tooled community workspaces for both technology and technological art projects. These include The Crucible, NIMBY (acronym for Not In My Backyard), and TechShop. The Burning Man Arts Festival, in which 50,000 participants come together for a week each year to build a city in the Black Rock Desert of Nevada, features a high concentration of high-tech art projects from Silicon Valley and the San Francisco Bay Area. Black Rock City, likened to the temporary autonomous zone (TAZ) of Hakim Bey, is itself a creative cluster. Artists and technologists build and test hybrid art/technology projects in the harsh but Dalí-esque desert, exemplifying a mixture of artistic creativity and technological innovation. The Burning Man organization and spin-off affiliates apply this know-how to not-for-profit community art/technology/building projects in public art, disaster relief, K-12 education, and solar energy.

Initiatives in the United States

While the European Union develops pan-European arts and culture policies, there has not been a great deal of interest in the United States in formulating arts and culture policies at the federal level. The largest share of government support for the arts and culture is typically provided indirectly through tax concessions which encourage individual and corporate giving. [13] Yet in 2003, the National Academies Press of the United States published a book titled *Beyond Productivity: Information, Technology, Innovation, and Creativity*. The book argues for institutionalized support for integrated art and technology practices, included under the term 'ITCP' for 'Information Technology and Creative Practices.' The book views certain "art and design practices as forms of computer science research and development." [14]

This book was followed up by a program at the U.S. National Science Foundation (NSF) called CreativeIT, which funded work at the intersections of art, music, performance, design, creativity research, and information technologies. The CreativeIT program in turn led to the first joint meeting of program directors and high-level representatives of the NSF and the National Endowment for the Arts (NEA). This joint meeting produced a roadmap for developing and supporting integrated art, technology, and research strategies at the national level. [15]

These developments intersect with current discourse within and beyond the NSF to expand some STEM (science, technology, engineering, and mathematics) educational programs to STEAM (STEM plus arts) programs. STEAM discourse had been an undercurrent in education, science, and technology circles until recent momentum from the NSF CreativeIT program and the joint NSF-NEA workshop described above. STEAM was given further impetus through a NSF five-year joint research award to Brown University, the University of Rhode Island, and Rhode Island School of Design, a prominent art and design school, to study the effects of climate change on marine organisms and ecosystems. Recently, U.S. Congressman James Langevin from Rhode Island introduced federal STEM to STEAM legislation, which as of the writing of this paper stands in committee. [16]

A handful of public universities in the United States have combined arts and technology programs which exemplify STEAM, including the CADRE program at San Jose State University in Silicon Valley, the Univer-

sity of Washington's DXARTS program, and Arizona State University's Arts, Media, and Engineering program. The prestigious art academies Art Institute of Chicago and Rhode Island School of Design have arts-based research and technology programs.

Art?

As we can see from the examples above, the arts hold a spectrum of new economic potentials beyond the art market, commercial arts, conventional art-in-education programs, and other domains in which artists traditionally participate. Emerging roles include the development or co-development of new technologies or innovation processes within business contexts, participation in creative clusters, and participation in STEAM-based education. Yet within the high status discourse of technology, innovation, and creativity, there are questions regarding the terms of participation. We may be reminded of Adorno and Horkheimer's critical stance toward the culture industries in the mid-20th century, and Benjamin's counterpoint.

To Adorno and Horkheimer, art's function is to challenge the alienating capacity of advanced capitalism. The culture industry brings the 'administrative rationality' of industrial production into arts practice and consumption, thus undermining its ability to challenge the economic hegemony. [17] Benjamin believed that art could participate technically in the same methods that support the culture industries but would invert their purposes to bring about new collective modes of production and participation that undermine the hegemony's ability to create status through a logic of aesthetics (as Hitler had aestheticized war in the 1930s and 40s). [18] These positions regarding the culture industry have parallels in the contemporary innovation industry. The innovation industry values the rapid expansion of the technological frontier. There is a notion of technological advancement building upon previous successes within a domain. Challenges and provocations are not a central part of this paradigm. Thus art-based intersections with technological innovation may be characterized in terms of their formal aesthetic value, expressive potential, communicative power, or humanizing insights. Yet we can see that art from the industrial age forward has a history of radical departures from the established norm, bringing about a reorientation or, to use a stronger term, destabilization of convention, perception, and/or established ways of doing or being. Consider the modern and postmodern works of art we value from the past: the work of the Impressionists, the Cubists, and the Fauves, the writings of James Joyce, the interventions into the concept of art by Duchamp, Warhol, Serrano, Koons, and Hirst. Contemporary Western society does not so much cultivate art that harmoniously stabilizes a practice, concept, or perception. It cultivates art that destabilizes.

In contrast, technological development values stabilization. The practice of engineering is to stabilize natural forces so that they act reliably within a device. This emphasis on stabilization extends beyond technological reliability to social and cultural stabilization as well, so that when we are acting within a reliable threshold of a technology, be it a bridge or an iPhone, we are also stabilizing reliable cultural practices. Postmodern technological art acts outside of these reliable thresholds. Thus it follows that art, as we as a society have conceived it, would not be instrumentalized into the service of status quo technological innovation. Instead, art would be more apt to push and pull on the assumptions of technological development as well as particular technologies and technological practices. This role is already realized by some elements in the art and innovation arena, including Disonancias and Tiltt's AIRIS program mentioned above. We can find further support for this way of understanding art's role in the new innovation economy. For example, President of the European Commission José Manuel Barroso's response

to Culture Action Europe's *We Are More* campaign shows an openness, at least rhetorically, to this conceptualization of art:

Sometimes we can have creative disruption, but it is from this kind of disruption that we can have real construction and also innovative thinking inviting us to prepare for the future in a mindful way. And in challenging times such as this, creative, critical thinking is more essential than ever. [19]

Conclusion

Truly incorporating art and technological innovation practices means admitting the dynamics of stabilization and destabilization within the discourse of innovation. By allowing art to be a churn in the system instead of a well-behaved contributor to sunny-day scenarios of creativity and innovation, we open up new dialogues about what technology is and can be. Such dialogues would come as institutions face the challenges of climate change, financial crisis, increasing competition for resources, and a generation of innovations involving populations existing beyond first world commercial agendas.

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SOFT COMPUTING: FORMS AND LIMITS IN COMPUTATIONAL AESTHETICS

M. Beatrice Fazi

This paper contends that soft computing can help us investigate the aesthetics of digital computation. Employing broader conceptions of aesthetics and perception, and whilst drawing upon the ontology of Alfred N. Whitehead, it uses soft computing to address the 'prehensive' dimension of the quantitative procedures of computation, and explores the interrelationship between the factuality and formality of computational structures.

This paper will argue that soft computing may be of relevance to the field of computational aesthetics. By focusing on the theoretical foundation of aesthetics in computation, I will show that soft computing can highlight the indispensable role played by abstract processes within the construction of experience.

Soft computing is a rapidly advancing area within computer science. It is characterised by an attempt to deal with uncertainty, approximation, randomness, and partial truth, and some of its most prominent examples include neural networks, fuzzy logic and evolutionary computation. 'Soft' techniques differ from traditional computing as they employ diverse methodologies in order to cope with the difficulties involved in achieving and maintaining algorithmic efficiency. Their originality and appeal lie in their ability to provide inexact, indeterminate and generative solutions to 'computationally hard' problems (i.e. questions that are too complex to be addressed via classic computational systems).

I will contend that soft computing can offer a means of investigating the aesthetic dimension of digital computation. However, 'aesthetics' will be understood here in a manner that exceeds the disciplinary bounds of a theory of art or beauty: in keeping with its etymological roots ('aisthesis'), it will be taken to denote a theory of relationality and perception. One further qualification: 'perception' will not be viewed as referring solely to human cognitive faculties. Just as aesthetics will be understood in a non-anthropocentric sense, so too will perception: it designates the ways in which experience is constructed, thus referring to the manner in which we encounter things and to the ways in which these things encounter others in turn. Consequently, 'prehension' may be a more appropriate term than 'perception.' I take this suggestion from the work of the philosopher and mathematician Alfred N. Whitehead, within whose ontology prehension plays a special role: it refers to the most foundational type of relation – the extrasensory awareness that all actualities have of earlier and future occasions – and is used to explain how all entities within the realm of actuality are acts of experience. Such experience is not the exclusive domain of human consciousness. All actualities are in fact held to experience one another, whether they are conscious or not, as the data that they inherit from past occasions leave them internally connected.

[1]

Whitehead's ontology and the broader notions of aesthetics and perception that I have drawn from it allow us to view computational structures as possessing a relational dimension that exceeds both their phenomenal effects and the intentionality of their users. My contention is that computational structures can be understood as systems of actual occurrences: they are concrete 'facts,' fully realised actualities, particular to their own spatial and temporal occasion. To focus only on the performative and qualitative character of these events, however, is insufficient. In my view, factuality itself is enabled by levels of quantitative, logico-mathematical abstraction. In a computer science context such abstractions are

usually understood as computing's *modus operandi*: those methods or processes that follow a well-defined procedure and describe how a task is to be performed. Yet I would argue that logico-mathematical abstraction also constitutes the 'form' of computation itself, i.e. its potential character, the pattern that defines its ontological possibility. My interest here is in presenting computational structures both as facts (actual instances, events) and as forms (patterns of potentiality). The aesthetic relevance of computation, in my view, lies in the irreducible relationship between the two. I will show that soft computing practices emphasise this interrelationship of fact and form, and thereby highlight crucial, although largely unaddressed, issues within computational aesthetics.

The relevance of this approach can be illustrated by looking at current understandings of computational aesthetics, but in order to do so I need to make a brief qualifying remark on digitality. Computation and digitality are by no means synonymous, yet both can be understood as processes of discretisation: computation, by virtue of its axiomatic character, involves the discretisation of procedures; likewise, digitalisation can be seen as the technological automation of those discrete procedures. I will focus on the discrete aspects of both computation and digitality below, as in doing so we can underline the fact that contemporary computational aesthetics has overlooked the prehensive dimensions of quantities.

This is important, as the concept of prehension affords a relation between the discrete and the continuous that has eluded contemporary computational aesthetics' attempt to connect the digital to the analogue. Media and cultural theorists, computer scientists and philosophers still disagree on an exact definition of digitality, but they do seem to view the digital as a discrete data technology that uses discontinuous values to access, represent and manage information. Yet, at the same time, the vast majority of philosophical, cultural and social accounts of aesthetic experience portray a universe of percepts and perceivers, the reciprocity of which is established by a rapport of continuity with what is given in experience. Hence the difficulty that digital aesthetics seems to be faced with: where the digital tends to be understood in terms of the discrete, aesthetics tends to be understood in terms of the continuous, or the analogue. The discrete nature of numerical and data quantities is thus largely omitted from aesthetic considerations of the digital medium. These accounts are often geared towards analysing its perceptual, performative, and phenomenical effects, which are possessed of characteristics often associated with the analogical. Codes, scripts, values, parameters and algorithms are viewed as performing actions, which in turn exhibit qualities and properties. Agency and quality thus appear to be key to the disclosure and employment of the aesthetic value of computation. These approaches risk dismissing the mathematical and logical nature of computational digital media. If the latter is specifically addressed, it is done so in a manner that understands the ontological power of logico-mathematical abstraction only in terms of continual calculation; this tends to be characterized as 'topological' in nature and expression, and flattened onto a plane of differential transformability. I, however, would like to propose that the impasse between continuity and discreteness could be re-thought in the light of the prehensive dimension of computational structures, as prehension exists before and beyond any performance, action, or effect. The approach that I am arguing for would retain the possibility of working with the reality of algorithmic entities by addressing the aesthetic dimension of their quantitative, discrete procedures.

Soft computing can help us explore these issues, for it serves to highlight that the rules and quantities of algorithmic construction are always involved with patterns of potentiality, and that these patterns are themselves expressed by abstract logical processes. It thus illustrates the importance of the interrelation of factuality and formality within computational structures. There are a number of ways to prove this speculative hypothesis, but I will attempt to do so here by looking at the empirical and rational characteristics of soft computing methodologies.

As noted at the outset, soft computing uses uncertainty and randomness to solve problems that humans are adept at, but which classical computational methodologies struggles with (face recognition or linguistic disambiguation, for example). Whilst indeterminacy is considered undesirable in the classic theory of computation, soft computing exploits it in order to obtain tractability, lower solution cost and a certain economy of communication. The metaphoric ‘softness’ of this approach is meant to afford an alternative to the ‘rigidity’ of the conventional analytic methods that found the classical theory of computation. Soft computing can thus appear more tuned to the ‘empirical’ levels of reality than traditional computation, as it seems to allow factual chance into its algorithmic formality. This point is perhaps proved by its ability to solve tasks that involve information gained from or modified by experience, such as the industrial application of intelligent systems geared towards solving ‘real life’ tasks (e.g. control, modelling and simulation). Soft computational systems have also been utilized in social science contexts, where adaptation to imprecise judgment, sense perception and emotion is key.

Generative algorithms provide an example of soft computation’s relation and frequent association with the empirical. Chance, I would contend, is particularly important for generative algorithms, as they encode formal rules via the application of a bottom-up approach designed to encompass contingent change over time. The programmer deliberately writes very simple instructions, and lets complex behaviour emerge through an iterative selection process, which picks the best representations of solutions, rejects bad results, and produces new ones from those that survive the procedure. Generative algorithms are therefore able to modify their own code, allowing new combinations to arise from parallel and random behaviour, and thereby simulating natural selection and biological evolution. [2] This process fosters autonomy and uniqueness, and has in consequence been employed by artists as a means of playing with the underlying rules of formal generation and structure. It however also offers an interesting prompt for us to speculate as to the ways in which empirical factors – in the guise of variation, selection and evolution – can enter the formalism of computation.

The example of generative algorithms illustrates that soft computing can be seen to be characterised by an empirical aspect. Yet this does not mean that soft computing dismisses logic and formality: where others have emphasised its orientation towards the empirical, I would argue that its most interesting theoretical implications lie in its indirect continuation of what might be called a ‘rationalist’ project of optimization, compression and synthesis.

My point is that soft computing, despite its openness to contingency, still operates within the rational, disciplinary bounds of mathematics and logic. This can be seen in fuzzy logic systems. Whilst the traditional method of computation uses binary logic, which permits only a dichotomous opposition of true and false, fuzzy systems compute via a logic that allows for differing truth values: they are thus able to reflect the imprecise definitions of language, and can engage with complex control, management and recognition problems that cannot be framed in ‘crisp’ terms. The fundamental idea behind fuzzy logic is that all things exist in degrees, and that we are in consequence bound to encounter imprecision in truth. Fuzzy logic responds to this (as does the seminal fuzzy set theory first outlined in 1965 by Lofti Zadeh) [3] by trying to tune knowledge representation, so as to make artificial systems function more like humans. Like the generative algorithms described above, fuzzy logic thus accommodates the contingent conditions of experience, but in capturing loosely-defined categories and generalising them it remains a formal model; so too does the generative algorithm, which puts forth a problem-solving strategy in terms of a set of axiomatic rules evolved upon a specific yet formally addressed situation. In sum: although many have associated the merits of soft computing with this orientation towards the empirical, I would argue that it is this formal dimension that constitutes its real potential.

This claim can be developed by looking further at fuzzy logic. The latter is a logical calculus designed to build a formal system capable of handling information devoid of analytic formulation. Fuzzy logic, however, also produces a logico-mathematical structure that can be computed, and which can be put into the finite terms that machines require in order to operate. One can therefore comment that the rationalizing power of soft computation stems from its capacity to enlarge the realm of actuality, through accommodating factors that could not be encompassed by mathematical formalization. Soft computing has consequently been viewed as incorporating a degree of quality into the computational process, as it can be interpreted as a quest to capture the 'continuity' of things through approximation. Imprecision would then seem to arise from a continuum possessed of degrees that can be broken down into 'fuzzy' chunks. One can see how this project can perhaps be associated with the 'analogical' digital aesthetic perspectives discussed above, which frames aesthetics in terms of the continuous transformation of perceptual qualities. Yet, in my view, fuzzy logic is also characterised by attentiveness to the implicit rationality of the real: its focus rests not on binary calculation per se, but rather on the inherent possibilities of calculation itself. Thus, contra those who would claim that the importance of soft computing lies in its attention to quality, I would argue that it returns us to the significance of the quantitative in computational aesthetics.

Fuzzy logic's advocates often emphasise that the technique uses imprecise indicators instead of exact values. However, I believe that if we look at the manner in which fuzzy systems deal with vagueness we are brought back to a question implied by Alan Turing's classical theory of computation, which he set out in 1936: how could one devise an 'effective method' composed of finite terms that might be able to put the infinity of quantities into the finite terms of a procedure? [4] Such a method would be a process of discretisation, as is the method by which fuzzy logic deals with vagueness. Briefly, fuzzy logic works through a system of sets with graded members; each grade is possessed of a different truth value, and each member thus forms part of a smooth but differentiated continuum. One might read this as an attempt to turn quantity (discrete grades) into quality (varied continuity), and to create a means of computation that comes a little closer to 'reality'. However, I would hold that it in fact remains just as reliant upon the quantitative and the discrete as Turing's theory of computation, as soft computing's ability to cope with the uncertain is itself grounded on the quantitative nature of computational formality. Fuzzy logic doesn't render quantity qualitative by attributing continuous characteristics to it: rather, the mathematical processes that allow fuzzy systems to accommodate approximation are themselves based on the procedural and axiomatic modes of quantitative abstraction.

It is important to stress now that the observations above locate soft computing within a broader debate about the limits of formal reasoning. These limits were envisaged by the logician Kurt Gödel in 1931, [5] and subsequently framed in terms of computability by Alan Turing in the 1936 paper mentioned above. Turing's famous thought experiment, the so-called Turing Machine, established the theory of computation by demonstrating that there are limits to what can be computed. His account has however received criticism over the last two or three decades, and much of this has involved framing his model as a closed formalism that doesn't allow for the influence exerted by the external factors of contingent reality upon its purely internal world of algorithmic procedures. This brings us back to soft computing, which as we have seen is engaged in an attempt to 'open' formalism to contingency. Yet, in my view, it is not by introducing the empirical that we are afforded a more 'open' formalism; rather, this openness is already granted by virtue of the fact that computation has intrinsic limits. I would contend that Turing cast uncertainty and randomness as intrinsic features of his model of computation by discovering the notion of the uncomputable, as this means that computation becomes defined by that which it is not: the formal logic of the algorithmic method is consequently always already 'open', as it tends towards its own limits.

We are thus returned to the import of the quantitative in computational aesthetics. We have seen that soft computing attempts to introduce the empirical into its calculations. Yet we have also seen that it does so without fully abandoning the rationality of the formal method. So, rather than focusing on soft computing's accommodation of contingency, I would argue that we should instead take soft computing as an illustration of the manner in which quantity is always already involved in the qualitative. This point can be made on two levels: firstly in terms of computer science, and secondly by way of reference to the philosophical ideas sketched at the outset of the paper. We should note that computing systems function through discrete processes: through axiomatic structures that operate via finite, and thus quantitatively distinct steps. Quantity also grounds the logical forms of computational structures, as it defines and shapes their possible configurations. Yet in Whitehead's ontology, as described above, reality itself is a succession of actual facts. Each is informed by a prehensive relation with other facts, and each has an equally prehensive relation to the quantities of their potential patterns. Earlier I described such patterns as the forms that enter into these actual facts. If we now consider these patterns of potentiality as the logical and mathematical forms of computational structures, then we would have a means of according computational aesthetics a far broader reach than has commonly been ascribed to it.

In conclusion, I believe that one of the most interesting issues that can arise from this way of thinking about soft computing is an awareness of the mutuality between factuality and formality. Soft computational structures are factual, as they are computational events with an actuality. In other words, they are acts of experience, as they inherit their constitution through the prehension of other acts of experience. This is their factual existence which, by virtue of this relationality, is possessed of an aesthetic dimension that is not uniquely reliant upon the contention – common amongst the approaches to aesthetics described above – that computational processes exhibit effects, agency and quality. I would also stress here that soft computing structures have a formality, and that this is expressed through their logico-mathematical character. For example, the procedure by which generative algorithms operate varies with contingent change: the factuality of this computational structure thus has a relation with the empirical world. In its factuality, however, it needs also to refer to what we referred to as 'forms' above, i.e. its logico-mathematic pattern, and this relation to ideality can once again be termed prehension. It is here, beyond the phenomenological outputs of computational structures, that we find the real ontological motive force of their interrelation. The forms of computation can thus be seen as an ontological, existent reality, and not just as a type of deductive reasoning that contrasts with the direct experience advocated by inductive approaches. Aesthetics, in this sense, is not the subjective judgement of the perceptual experiences that a computational structure presents to us; instead, it is the relation between factuality and formality. Although soft computing is limited in the degree to which it can help us develop this position, I believe it can help us shift contemporary discourse towards the issues that are indicated here.

References and Notes:

1. *Alfred N. Whitehead, Process and Reality. An Essay in Cosmology (New York: Free Press, 1978).*
2. *See Melanie Mitchell, An Introduction to Genetic Algorithms (Cambridge, MA: The MIT Press, 1998).*
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4. *Alan M. Turing, "On Computable Numbers, with an Application to the Entscheidungsproblem," Proceedings of the London Mathematical Society 2, no. 42 (1936): 230–265.*
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AMBIGUITY AS A SIGNATURE OF THE SUBLIME IN MEDIA ART

Ksenia Fedorova

The paper focuses on the effects of media artistic representations of ambiguity in perspective of the classical aesthetic question of presenting the unrepresentable. The concept of the sublime reveals how representations of indeterminacy in relation to decentralized systems are capable of creating a temporary gap in cognition, thus enhancing the feeling of potentia and opening towards the reality of nonconceptual mind and interconnected being.

The concept of the sublime has been widely appropriated within technological arts and culture: as the computational sublime in relation to autopoiesis in generative art (McCormack, Dorin); and in relation to immersive virtual environments, as the digital sublime (Mosco) and anti-sublime (Manovich) in relation to data art and data networks. At the same time, the principle of ambiguity is often placed at the heart of algorithmic art, hyperfiction, game environments, interactive cinema and other genres that engage narrativity. In this case, we do not claim to make any comprehensive and systematic account of how ambiguity states itself in various media arts. This is more a methodological introduction to one of the possibilities to expand and deepen understanding of media arts through the lens of aesthetics, in particular through the concept of the sublime taken as ambiguity.

The sublime is a term of both control and surrender, of a negative pleasure, associated with the impossibility of either mental or physical representation. This uncanny feeling of being confronted with the limits of comprehension, of facing the unpredictable and the unknown, often works as a sort of litmus, testing the “seriousness” of the produced effect, the transformative potential that reveals itself through nonattachment and groundlessness. As applied to contemporary life and culture, this category becomes a “sliding” or even “empty” signifier for the space of liminality; for limits as the basis for an ontology of interaction and communication at large. Privileging heterogeneity and difference (the transcendental “Other”), the framework of the sublime refers to the questions of individuation and authenticity of the self, which is especially relevant in today’s multicentric social environment.

This quality of being in uncertainty, accurately described by Keats’s famous term “negative capability” (productive doubt, precedence of intuition and imagination over consecutive reasoning) is fundamental for artistic production. It is also extended towards media theory’s concept of “interface”, or, “intraface” (Al. Galloway) that may be interpreted as a “‘zone of indecision’, between the inside and the outside” [1] (Gérard Genette) – a zone of nonchoice between the edge and the center, inside and outside.

In the fundament of any system of relationships — and at the base of any individuation— lies a heterogeneous manifold of potential differences, a pre-individual field of singularities (French philosopher Gilbert Simondon). The tensions of singularities frame a *marge d’indetermination* (“margin of indeterminacy”), described by Simondon as a characteristic in machine / human creator relationship), a concept that opens towards the broader paradoxes of structural and ontological causality (quantum indeterminacy).

Theories of distributed intelligence, emergence, and complexity present challenges for newer types of representation of reality as a self-organizing flux, with a role of the observer as a measurer of the operations of chance. Conscious appeal to “arbitrariness” in art started as early as work by Duchamp (Erratum

Musical), Morellet, Cage, De Vries, which technically was already a prototype of “algorithmic art.” It was not always an act of a visitor (observer/user) that determined further unfolding of a work, but of an artist. The important stage was to recognize that emergence happens through differentiation of pieces of reality: that their patterns are relative and the processes of their organization into structures indeterminate. The natural continuation of this aperçu became interactive art, where a viewer is an actor determining the development of the work. Relationality and, thus, unpredictability is an integral part of both relational aesthetics and art, and interactive media art. The latter is not surprisingly compared with the quantum wave function that produces an evolving “space of possibilities” (whereas object-based art is akin to classical particles). [2] One of the classic early examples of interactive media art illustrating the principle of ambiguity is P. Weibel’s “Observation of the Observation: Uncertainty” (1973), an installation that investigates the special mood of disorientation when self-perception is given only from a third-person perspective. Is it a perspective of the “transindividual”? Does it feel overpowering and totalizing enough to name this sensation “sublime”?

Effects like change of perspectives and disorientation of the senses that are often used in media installations (Olafur Eliasson’s experiments with optics and space, Carsten Höller’s “Text Site” CAVE environments by Jeffrey Shaw, Agnes Hegedüs) produce the image of specific kinds of distance between the self and the world, a gap through which enters the terrifying, stunning, revealing unknown. These illusionary worlds allude to a numinous realm which seems to have its own self-generated ontological substance. The projects like “Sensory Environment” (2003-2004) by Chris Salter, consisting just of barely perceivable threshold levels of light and sound, confront the visitor with a direct experience of intense concentration and restlessness that arises in the process of breathing during meditation. Inability to estimate the proportions of your own body in this kind of installations often creates effect of what might be termed overpoweredness.

A range of provoking questions is engendered by conceptual dualism of complementarity and metastability in works that collide the virtual into physical reality. One of the examples could be a work-in-progress by a Russian group “Where the dogs run” entitled “Quantum Mouse” that visualizes the double-slit experiment in a form of interaction between the movements of a live organism and its virtual doubles. A mouse is moving through a labyrinth, followed by camera. Every time it makes a turn, its virtual doubles make the opposite decision.

Other examples address the reactions of anxiety and perplexity in relation to the qualities of equivocality and vagueness, as in such natural and social phenomena as (respectively) the immune system, colonial organisms, cellular metabolism, spontaneous order in economic systems, social networks, etc.

The concept of the sublime reveals how representations of indeterminacy and ambiguity in relation to decentralized systems are capable of creating a temporary gap in cognition, a disruption of conventional contexting cues, thus enhancing the feeling of potentia and opening towards the reality of nonconceptual mind and interconnected being.

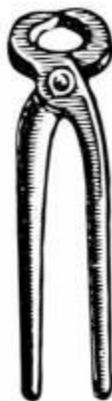
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2. *Jeremy Levine, “Quantum Systems and Interactive Media Art,” Digimag44/Mag09, <http://www.digicult.it/digimag/article.asp?id=1456> (accessed August 20, 2011).*

CRAFTING COMPLAINTS AS CIVIC DUTY

Jamie Ferguson & Daniel Wessolek

This paper presents issues and ideas connected to the concept of complaining in general and the work of the Complaint Department specifically. Here we present two case study examples that illustrate the work and process involved, and explain why we think complaining can lead to a better world.



complaint department

One variation of the Complaint Department logo, based on a set of tools from the Open Clip Art Library and the font Vollkorn by Friedrich Althausen. Copyright by the authors.

Complaining as a means of expression should encourage the individual to acknowledge the seemingly inconsequential annoyances of everyday life as opportunities for discussion and participation. By encouraging the potential for engagement, awareness and conscious expression can be experienced as creativity and even denote performativity. It is our understanding that expression in this sense can also lead to self-worth, gratification, and even collective well-being. Studies show that emotions are as contagious as a virus. [1]

Inherent to being human, to complain was once seen as a powerful source for citizen definition and direction; to speak-up, to object and to protest was understood also as a reaction for something. The

Complaint Department recognizes the importance of a platform for complaining and sees this as a powerful means of expression and of citizen agency.

It's not polite to bitch, grumble or whine. To protest against something, which is how the term is now usually implied, is discouraged. The 'complainer' is typically depicted as self-interested, cantankerous, over-emotional, even anti-social. One might find little understanding in a pervasive market where the 'person as consumer' becomes an aggregated commodity item with little individuality. One's efforts seem lost in as many products and services and consumers out there as there are complaints to be made. Complaints are met often not without some sympathy but without agency. The current state of making a formal complaint seems curtailed to an industry operation, an endpoint having little palpable impact. Few bother, understandably, to invest the time or energy.

It is a highly valuable resource when an individual makes the decision to invest the effort and time involved in voicing an opinion. To formulate and describe an issue, to communicate this, to even go so far as to suggest a possible solution, is as close as one can get to genuine field research and user feedback. This information is a source for design strategy and conceptualizing futures. To mobilize the collective imagination, a complainer not as an anti-social but as participant for public good and improvement gives rise. Such direct and participatory methods for evaluating our present culture can lead to a better understanding of the underlying societal structures and patterns at work. A recognition of the current state of affairs can embed an appreciation for alternatives.

Complaining is at once a strategy and mode of intervention, a means to counter-act. By encouraging the expression of one's reactions to events or situations, the act of complaining can be reappropriated. The Complaint Department regards the ability of crafting complaints as a civic imperative for the public good, to which any small contribution is valuable. Enacting a call for change, choice, or accountability, citizen democracy can promote accessibility and transparency. By leveraging the freedom to disagree, those who are dishonest or do not act in favour of the public good can be discredited.

We see the Complaint Department as an ongoing art /design agency project with the goal of finding and communicating what we call improvables: design problems in everyday life that cause negative interruptions. The case study examples illustrated below present some of the issues the Complaint Department deals with. Instead of circulating negative emotions, we believe that 'room for improvement' is opened up through this approach.

Those familiar with BIXI [2] will recognize the public bicycle sharing system in Montreal that is growing in popularity. It is comparable to the Stockholm City Bikes or to Vélib' in Paris. The system is made up of bikes, bike docks, and pay stations powered by solar panels. It is an opportunity to evaluate different instances of public systems in various cities, and to think about their urban context and cultural variances. These systems have an impact on urban fabric to varying degrees and on different levels of discussion, as it seems many have an opinion or story to tell about their experience. Complaint Department is interested in how such systems can be embedded within seemingly very rigid infrastructures and how these implementations can alter one's experiences, whether this takes the form of added value and improvement to one's daily life or instead contribute stress and irritation.

In this case an attempt to rent two bicycles with one credit card failed. Normally, the casual user can purchase up to two 24h accesses on one credit card. After accessing the second bike, it was discovered that one was damaged, though no other bikes remained in the rack to choose from. The Customers biked to the next nearest stand and attempted to replace both bikes so they could begin their journey

again with equal time remaining on the trip. After replacing one bike, a second bike was no longer permitted. It appeared the number of bicycles allowed was limited to one after the first return. Were important instructions not followed or could one speculate that this scenario has been generally overlooked in the workings of the system? One might be satisfied with a reimbursement, but this is also an opportunity to enhance communication and/or usability of the system. The overall importance for continued evaluation of products in their environment over time, after they have been released into the market and have accumulated feedback, is integral.

This Customer requests a different flavoured yoghurt in his nearby grocery store. Stores of the same chain carry a variety, so he often goes to a different location in order to get what he wants. Upon request, the manager of the supermarket says he will try to fulfil the wish. After some time, Customer asks the shop manager about the result of his enquiry. The manager is very sorry, he has tried everything possible, but a store of this size is not able to fulfil this particular request due to decisions made by upper management of the chain. Customer is sceptical and decides to contact upper management directly. The representative of the chain is not aware of any such decisions, and strangely enough, some days later there are a variety of flavours available at the store. Interestingly, other suggestions made at the time of enquiry, for example, to keep discounted food that is close to the date of expiration separate from the fish section, have been implemented. Customer imagines that this follow-through might lead to a greater awareness for the value of consumer requests with a store manager, and in doing so has also improved business.

Corporate complaint departments still typically handle complaints as a problem, not as potential symptoms of a still improvable product or service. The focus lies mainly on the relationship with the customer and not losing them as a result of their complaint, instead of utilizing the complaint as resource. From our experience, complaints are a rich source for problem detection and voluntary insight that is generated by those confronted with an improvable. Complaint Department aims to detect and communicate these improvables, sometimes by describing the occurred, sometimes by coming up with design solutions.

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UNCERTAIN AESTHETICS: NETWORKS IN THE AGE OF EMERGING TECHNOLOGY

Renate Ferro & Timothy Murray

We understand Uncertain Aesthetics to be a critical component in the performative spaces between contemporary conceptions of networks. The surge of digital accumulation, the continual surprise of informational texture and the layers of expressive multiplicity are what lend networks their creative power – as networks interface both real and virtual spaces.

In approaching our thoughts about "Uncertain Aesthetics: Networks in the Age of Emerging Technology," we understand uncertain aesthetics to be a critical component in the performative spaces between contemporary conceptions of networks. The surge of digital accumulation, the continual surprise of informational texture and the layers of expressive multiplicity are what lend networks their creative power - as networks interface both real and virtual spaces in public and in private. We are attracted in our curatorial and artistic work to projects that capitalize on the expansiveness of the digital and that confront the user with the realities, thinking here of Maria Miranda's exciting project of undisciplined knowledge (2009). Undisciplined, that is, as we embrace it from within the legacy of interactivity, a practice that both solicits the user to respond to a set of predetermined choices and gives itself over to the users' momentary stages, creating works and archives whose algorithms and structures leave them incomplete.

In our work we have drawn upon our reliance on artists and theoretical principles of uncertainty as they have shaped our collaborations in research, curating, and creativity to shape this presentation. Tim, a curator of new media and critical theorist, and Renate, a conceptual artist mining the fields of the public and private within the creative folds of old and new technologies, collaborate on joint projects that are framed by emergent technologies in dialogue with the layered tapestry of culture, theory, and art. Collaboratively our interventions through the Rose Goldsen Archive of New Media Art <http://www.goldsen.library.cornell.edu/> or The Tinker Factory <http://www.tinkerfactory.net/> both at Cornell University or through our curating of the –empyre- new media listserv <http://www.empyre.cornell.library.edu>, we combine technological and archival platforms while relying on unsettling, contemporary understandings of aesthetics, psychoanalysis, memory and fantasy. (We might add that –empyre- soft-skinned space is currently discussing the topic we enlist during the month of September <http://lists.cofa.unsw.edu.au/pipermail/empyre/>). Key to our shared interests is the shuttling back and forth between the public and private spheres of the archive, as the archive takes on greater weight in networked culture and as networked culture destabilizes the certainty of the archive's relation to aesthetics. As we use the archive, it is a rhizomatic relational structure that ebbs and flows in relationship to those who engage it.

To some extent, this is not something new to digital culture. The archive, Foucault wrote as early as 1969, is the horizon of "enoncés" marked by their "thickness of accumulation" which never ceases "to modify, to change, to disturb, to upset, and sometimes to demolish" (Foucault, 1969, 164). Such multi-layered thickness, which we might envision today as a fractal conglomeration of accumulated data, is what constitutes the lively energetics of the archive's erasure of previous notions of stability and certainty. Rather than grounding the specter of erasure in conventions of archival legibility, we are drawn to the expansiveness of the digital event's confrontation of the user with the realities of undisciplined knowledge. Undisciplined, again, once we embrace it from within the legacy of ruptured teleologies or

even from within the forgetful field of what Derrida understood as the differances of the erasures of archival fever.

The archive dissipates the temporal identity from which we like to admire ourselves to conjure the ruptures of history; the archive breaks the lineage of transcendental teleologies; and there, where anthropological thought interrogates the being of man and his subjectivity, the archive explodes the “other” and the “outside.” (Foucault, 1969, 172). It is in this sense of an interrogation through art and curating that we have formulated our sense of archival practice as an explosion of the outside as the imaginary boundary that separates the public from the private.

At the same time as Foucault argues for a generalized archival discourse of difference, he gestures to the promises of institutionally specific practices that might profit from the very “surface effectivity of discourse” in the expansion and accumulation of the archival event. Foucault sees in the institutional commitment to expanding resources, open archives, and limitless storage (all in the age preceding “open source” archiving) something different from the legacy of “legibility” and “memory.” For it is precisely the surge of accumulation, the continual surprise of informational texture, and the layers of enunciational multiplicity that lend to the archive its power. While “surface” might often be associated with only the threshold of memory, if not also with mere digital glamour, we are fascinated by how connective screen cultures have empowered the everyday event of the archive. The screen lives and breathes memorial reconstruction while also interacting with linked associations provided by media and networked cultures.

Most reflective of these conceptual parameters is our curatorial collaboration with the –empyre- listserv. –empyre- was initially founded by Melinda Rackham in 2002 as “a soft-skinned space,” one that would create a new public network of artists and theorists to spawn a virtual discussion of emergent practice. Now a community of some 1500 international members, the community focuses each month on the discussion of emergent topics important to the new media community, while maintaining an on-line archive of its ten years of discourse. Part of our ongoing commitment to maintaining and growing –empyre-, during a period when Melinda and previous managers have moved on to other projects, is to profit from the vitality of this listserv as a literal reconfiguration of public space. Initially, –empyre- capitalized on the freshness of the web by soliciting an online community via complex discourse delivered to the members’ e-mail mailboxes and simultaneously preserved for a public web archive. Now with the arrival of social networking sites such as Facebook and YouTube, which users voluntarily visit for less robust forms of conversation, we remain committed to maintaining the more antiquated e-mail format of –empyre- as a means of disrupting the now settled norms of social networking with heady e-mail blasts and monthly topographical shifts of discussion topics. While limited in scope to textual communication, –empyre- continues to resist the corporate codification of public net space while continuing to render uncertain the frameworks of networked space and global aesthetics. We even understand the fascinating amoebic syncopation of the listserv to accentuate the flow between public and private, as conceptual gaps occur when subscriber’s threads fall silent because other subscribers do not respond, or intent and content is misunderstood, or even when there is a language barrier between subscribers writing in differing languages. At all times, however, the postings accumulate, whether in singular silence or cacophonous dialogue, to result in a soft-skinned space of expansive and effervescent chatter about the ephemerality of digital aesthetics and its uncertainty.

Within both real and virtual spaces, The Tinker Factory and the Rose Goldsen Archive of New Media Art are born from similar notions of digital accumulation. Within the real space of the open lab, The Tinker Factory allows generative networking of ideas, problem solving, and skill building through practice and

tinkering. The Tinker Factory is a lab for research design, creativity and interdisciplinary technology created by Renate converging the cross-disciplinary areas of new media and emerging technology. As a space that exists "outside" of regular university programs and curriculum, the research lab, nurtures interactive, technological, and artistic research, by inviting students as well as faculty from many of the University's multi-disciplinary colleges to not only investigate technical possibilities, to engage in artistic collaborations, as well as critical and historical implications for ongoing research projects. In this workshop atmosphere, participants have investigated both the networked extension of public space and experimented with how digital and analog components might render uncertain the parameters of public space through interventions with noise, light, and networked culture.

Similarly, The Rose Goldsen Archive of New Media Art exists as a flexible library and networked space that has grown over the years to house collections of American new media art, Chinese and Taiwanese contemporary and new media art, internet art, CD-Rom/DVD Art, and, now expansive collections of video art that rekindle new media's relation with its distant past. Following the principles of undisciplined knowledge, the Goldsen Archive has set out to be indifferent to conventions of archival legibility in order to catalyze a critical rethinking of the meaning of the archive in the age of electronic art. At stake is a reconceptualization of art away from critical dependency on the narrative of history, the psychology of identification, and even the heroics of connoisseurship. Most important, its shifting reliance on online and offline platforms embodies the networked condition as grounded in tension with deeply influential institutional constructs.

Renate's on-site and on-line artistic project, *Private Secrets/Public Lies*, exemplifies the toggle between both the real and virtual spaces of the archive. Secrets and lies are at the crux of networked relationships whether they are grounded within the privacy of family dynamics or the public realm of international government relations. Most interesting is how easily the public flows between those two social constructions in the digital age. In her compelling work of non-fiction, *A Chorus of Stone*, Susan Griffin emulates the interconnectedness of how the personal experiences of an individual can have resonances into the affairs of international states directly relating to the underlying causes and or effects of war.

The inter-relationship between matters of individual privacy, secrecy, and concealment on one hand or the open, forthright, tendency for revelation were also key contradictions in the biography and life work of Sigmund Freud. It is for that reason that Renate uses Freud's writings as grounds for inspiration. In his construction of the screen memory, he provides us with insight into how memory is re-composited in the present. By looking at the past from the present we attempt to uncover the deposits of our unconscious archive of memory while acknowledging how the presentness of memory depends on the structural role of erasure through the processes of revision, re-inscription, or re-presentation, a memory conglomeration of the accumulated uncertain data/memory.

Both a performative, collaborative installation and an on-line game, the project, *Private Secrets, Public Lies* <http://www.privatesecretspubliclies.net/> showcases the collective screened memory of the participants whereby each contributor is asked to re-constitute the lively energetics of his or hers personal trove of secrets. In this project the variable of erasure is foregrounded through the underlying code and the intrigue of viral technology.

The on-going construction over time of this project as a collaboration with willing participants in the real public spaces of an installation toggled to the virtually accessible online game enables an assemblage of data traces in an ever expanding site. In the virtual version of *Private Secrets/ Public Lies* subsequent screens of the project ask the user for inputted text data, the content of which is parsed into keywords

via code and algorithms. What is left for the participant to interact with is an archive of floating data bubbles each filled with words left from previous participants. As players manipulate residual keywords from former user's information, the newly formed keyword phrase interfaces through World Wide Web via Bing. Having had their private secrets erased by fusion, the players are able to peruse news feeds, entertainment, and advertisements. The more often the interactive simulation of Private Secrets/Public Lies is activated the more often it implicitly records and archives the misguided personal information and deconstructed content and meaning of the originally intended personal information. What remains accessible on the homepage is not the original private secret but an archived list of what was subsequently transformed by player manipulation and internet linkage.

This playful translation of private data, enabled by the speed and instantaneous nature of the viral context, meaning, and intent of the original texts are playfully reminiscent of the notion of "erasure" within instability and uncertainty of Foucault's archive. The nature of evidence and memory is transformed in relation to the technology embedded in it. The real truth can neither be accessed nor verified. But, thought otherwise, couldn't we say that the real truth, at least as existent in the world of Web 2.0, consists of the active, playful, and provocative erasure of memory itself.

In a new project, Suspicious Packages <http://www.renateferro.net/suspicious/>, Renate begins to lay the groundwork for another archive, a collection of audio narratives. As participants recount situations where personal space or belongings have been under suspicion, the territories between the private and public again become blurred. Difficult to demarcate a border or marker that divides or separates, often times suspicion takes on a contested imaginary. As the project spans both the real and virtual spaces of exhibition, the object relations of packages of all shapes and sizes will trigger digital events via sensors that will illicit channels of video feedback in real time intermixed with archival footage, animation, still images, and sound.

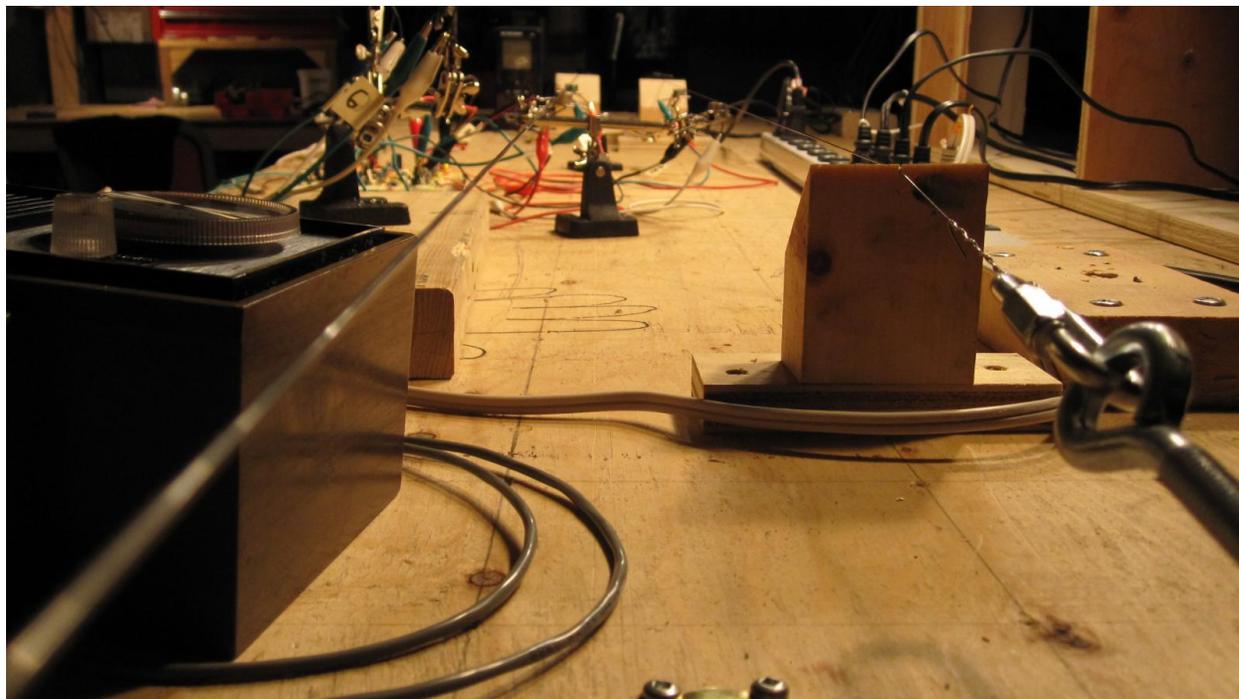
In the real spaces of emergency preparedness as Renate and Tim left New York one day after the tenth anniversary of 9/11, Mayor Bloomberg in a televised press conference urged all citizens to be wary of suspicious packages. In the very early stages of researching the project, Renate took note of the virtual links online to both the Centers for Disease and Prevention and ready.gov the place to get up to date information on emergency preparedness. The relationship of information on the virtual site and the urgency to manage the panic of an event in real space and time were sources of reflection for the relationship between an artistic archive online and the manifest of that in a real time exhibition space.

Our aim in presenting the cross-pollination of both our independent and collaborative work, work that remains between the interstices of the real and the networked, between the Goldsen Archive for New Media Art and the Tinker Factory is not only to move between the creative and research worlds in new media arts, but also to continue to forge innovative initiatives that will expand our notion of the archive itself and the range of relational artistic interventions in its midst. Additionally, these parallels lay the conceptual groundwork for future cross-disciplinary ventures where the value of conceptual tinkering with technical and physical tinkering opens the possibilities of inventive research with the network of uncertain territories.

VIBRATIONS AND WAVES

Peter Flemming

I am a folk machinery artist, doing electronics handcraft 'by ear,' tinkering intensively and intuitively in the studio. This paper discusses my current work *Vibrations and Waves*, an ongoing series of experiments about sound and resonance. Along the way, the paper introduces some working methods in my studio practice.



Vibrations and Waves, 2010-2011 (in progress, Peter Flemming, piano strings, turnbuckles, helping hands, wooden table, wooden blocks, DC power supply, electromagnetic coils, glass, mouth-harp, 555 oscillator circuits, screwdriver, radio, Creative Commons Peter Flemming Attribution Non-Commercial Share-alike.

I am a folk machinery artist, doing electronics handcraft 'by ear,' tinkering intensively and intuitively in the studio. This paper discusses my current work *Vibrations and Waves*, an ongoing series of experiments about sound and resonance. [1] Along the way, the paper introduces some working methods in my studio practice.

Vibrations, waves, and therefore sounds, occur when machines do what they are built to do: wires hum, motors whir, gears grind, and metal clangs. In this sense, sound is a natural by-product of all machine activity, even if it is not always the intended output. Where utility is the primary consideration, these vibrations tend to be ignored or actively suppressed. [2] Mechanical systems in which oscillations are desirable include musical instruments and certain types of sound-based artwork.

In *Vibrations and Waves*, notions from intentionally sound-producing machines are transposed onto ordinarily non-musical devices, and vice versa. Undesirable vibrations move from periphery to centre stage. The normal utility value of the machine becomes a secondary consideration, as it is regarded through the lens of musical practice and its elements such as pitch, harmony, and rhythm.

By revealing the basic physical ‘magic’ within our everyday machines, structures and systems, I wish to show that they are subject to material laws that are fundamentally mysterious and outside of our absolute command. This elusive ‘magic’ is a worthwhile reminder that we are not in total control in a digital-technocratic world where total control seems to be a goal.

My interest in sound and resonance was sparked by an accidental discovery made while working in the studio. [3] A project required a silent rotating mirror. The natural vibrations of the motor were physically amplified by the spinning glass, and I tried all kinds of things to muffle the sound. After a long day and a very late night I gave up without success, and let the motor spin away undamped.

I stared at the running motor for quite some time while listening to its drone. Slowly, the annoying noise transformed into a compelling, and even beautiful sound. In my over-tired state, the motor seemed to be singing to me. There was a provocative contrast between the ‘dirtiness’ of the unadorned device and the surprisingly elegant sound issuing from it. With scrap glass and a salvaged industrial printer motor as my unlikely revelators, I realized that I was experiencing the phenomenon of resonance.

Eventually this project became an installation in which a dozen rotating sheets of glass fill a room with powerful, singing tones. Entitled *Stepper Motor Choir* (2008), this was my first sound-based work and the precursor to *Vibrations and Waves*. [4]

All things have a natural resonant frequency. This intriguing idea suggests a baseline connection between just about everything, but I will keep to the physical for now. The metal body of my 1981 Econoline van would vibrate intensely when reaching certain resonant speeds. Our bodies have resonant frequencies. As does the stapler on my desk, as do skyscrapers, bridges, tectonic plates...

The current public incarnation of *Vibrations and Waves* is a series of video documents, which I see as an extension of my sketchbook. [5] Video provides a record of a temporary set-up, and helps me clarify vague ideas so that they can be communicated to others. Most of my experiments use a limited palette of basic tools and readily available materials. To create vibrating magnetic fields I use simple variable frequency oscillator circuits, rare earth magnets and cheap electromagnetic coils. These fields sonically activate things like scrap glass, metal objects, and tensioned wire. A full sheet of plywood cum worktable has served as a resonating and amplifying surface, and also as the main staging area for most of these experiments and their documentation.

The most fascinating sounds occur when the oscillator is slightly detuned from the materials' resonant points, and when multiple oscillators act simultaneously. In these cases, the slightly unbalanced system wavers at the edge of stability, like a tipsy tightrope walker attempting to find the centre of gravity. When left to run their course, these simple initial conditions give rise to complex and surprising results: shifting and shimmering harmonics, sudden crescendos and alternating rhythmic beat frequencies.

At one point, when leaning on the table to adjust something, I noticed that even a little weight would stretch the strings somewhat, altering their natural frequency. The effect is similar to, yet distinctive

from, manipulating the electronics. I replaced the manual tuning element of the oscillator circuit with a photocell, so changes in ambient light would be reflected in the driving frequency. Modulating these variables adds to the complexity of the system. It becomes a kind of instrument that can be performed. I began to think of ways to automate this.

To do so, I have been developing a diverse, modular 'material vocabulary' of techniques and devices, which I will draw upon for future site-specific works. So far, this repertoire includes: long vibrating wires, electromagnet coils, simple oscillators, saltwater, water as weight, glass vessels, glass panes, four-bar reciprocating mechanisms, motorized cranks, electric guitar pick-ups, found object resonators, swinging pendulums, cinder blocks, solar circuits...

Machine 'performers' will converse with and manipulate these various elements: an animated pump system will use water weight to tension wires, slowly modifying sonic characteristics as it is displaced into different hanging containers; oscillators could change pitch based on ambient light levels, regulated by motorized dimmer devices and automated shutters.

Each 'performer' will hypnotically repeat simple tasks, at their own lethargic pace, independently, but simultaneously. They will combine for a cumulative effect that is subtly unpredictable and in continuous slow, fluctuation. By letting machines run the show, I hope to open up a temporary space for contemplative consideration of the forces at work in the environment around us. Connecting the visible and physical attributes of mass and light to the sonic intangibility of resonance is an exploration of the fundamental properties of the stuff the world is made of.

Mistakes and accidents such as the singing motor or leaning on the work table frequently shape the course of my artwork. They typically occur when I have met some kind of technical or financial limitation, or some material quirk asserts itself contrary to my aims. After much hair pulling, occasionally I realize that the unintended behaviour is interesting in itself. I drop the original goal and pick up a new path, letting it lead me along instead of trying to bend it to suit pre-determined criteria. Knowing how to read these hidden signposts as they reveal themselves is a crucial part of my process.

I look at what I make as the electro-mechanical equivalents of short stories. Naturally, every good story needs some tension to keep it going. In my machinic 'texts,' I try to create tension by intermixing different systems. Organic ones blend with technological ones, the old with the new, and the handmade with the machine-made. And rather than words, sentences and paragraphs, I use bolts, batteries, metal, and custom electronics.

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2. They can even become dangerous. Frequently cited is the 1940 collapse of the Tacoma Narrows bridge. Wind-generated reverberations created a rippling ribbon of concrete and steel: [http://en.wikipedia.org/wiki/Tacoma_Narrows_Bridge_\(1940\)](http://en.wikipedia.org/wiki/Tacoma_Narrows_Bridge_(1940)) (accessed July 10, 2011).
3. Norman T. White has spoken eloquently on 'Mistakology.' Norman T. White "Mistakology," February 5, 2006, summarized by R. Debatty, <http://we-make-money-not-art.com/archives/2006/02/just-listened-t.php> (accessed July 10, 2011).
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CELL TANGO: AN EVOLVING INTERACTIVE ARCHIVE OF CELLPHONE PHOTOGRAPHY

Angus Forbes & George Legrady

'Cell Tango' is an interactive multimedia artwork consisting of a series of animated visualizations. The visualizations are based on a dynamically evolving collection of cellphone photographs contributed instantly by the public. These images, and the accompanying tags that categorize and describe them, are projected large-scale in the gallery, continuously shifting as new contributions are added.



Fig 1. A participant examines the Cell Tango installation.

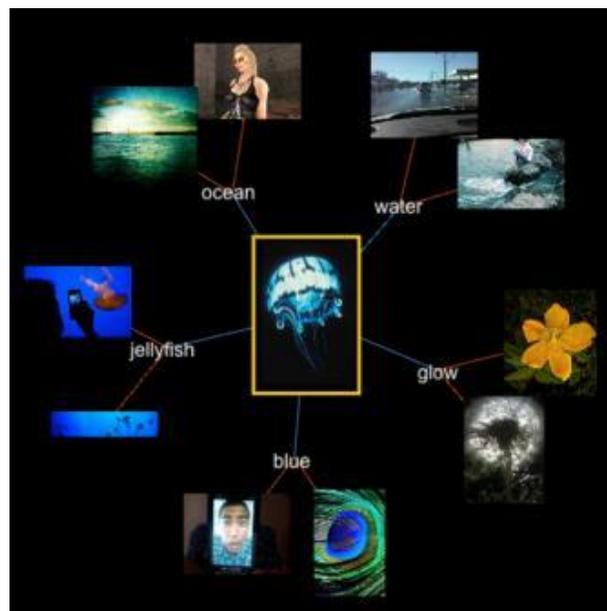


Fig 2. Detail from the 'Cell Burst' visualization. The center user-submitted photo is connected to other photos via semantic tags.

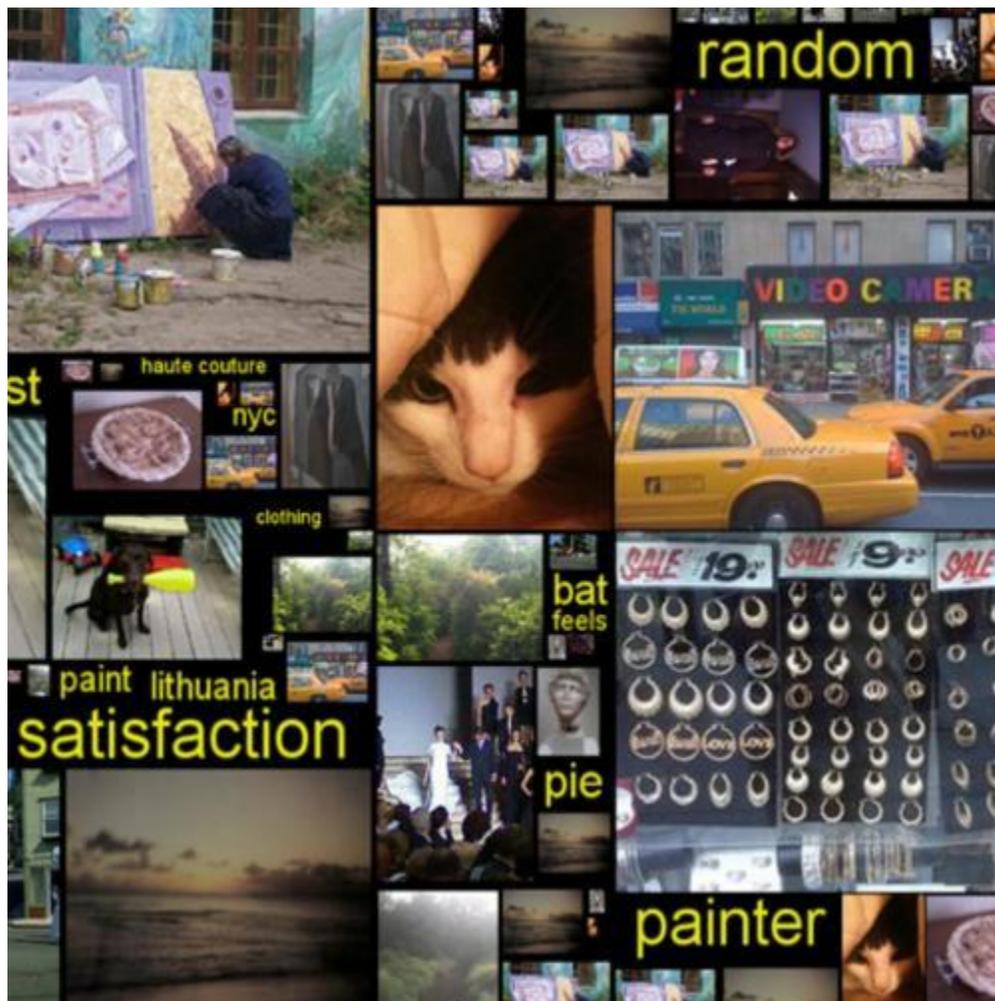


Fig 3. Detail from the 'Cell_Bin' visualization. User-submitted photos and tags are organized into a mosaic using a bin-packing algorithm.

'Cell Tango' is a dynamic artwork presented as an interactive installation in fine arts museums, in galleries, and at special events. The public visiting the exhibition is invited to interactively participate as a contributor to the project through the submission of cell phone images. These images become the primary content source of the Cell Tango artwork, and are stored online at the Flickr photo management and hosting website.

The gallery display consists of a large cinematic projection that presents the contributed cell phone images in four animation configurations – 'Cell Bin,' 'Cell Clusters,' 'Cell Burst,' and 'Cell Finale.' The public is asked to add descriptive tags in the subject heading along with each submitted image. These descriptive tags function as search queries for retrieving other images from the larger Flickr database of public photography and also as organizational devices to create thematic clusters of images. The intent is to explore the potential of unexpected juxtapositions where common semantic labels can generate interesting visual relationships.

The animation 'Cell Bin' consists of visualizing the most recent images in the database on the screen using an algorithm that selectively places large images first and then gradually fills in blank spaces with gradually smaller images until all of the empty screen spaces are filled. 'Cell Clusters' consists of thematic clusters of found images based on contributors' tags placed around each incoming contributed image that are marked with a yellow frame. The 'Cell Burst' animation throws images on the screen that then open like bursting fireworks, placing the tags once the image appears, followed by the found Flickr images associated with each tag. 'Cell Finale' concludes the visualization sequence by rapidly placing on screen all of the contributed images in the database one after the other in the spectacle action of fireworks exploding in the sky.

The artwork is dynamic – meaning that what is featured is continuously being generated in real-time according to the rule-sets of the computer code. There is a conscious approach to software development, and thus it is a form of authorship. The artwork has been designed in such a way so that the software implementation that drives the project expresses the concepts, aesthetics, poetics, and artistic intentions and philosophies of the artists. The software development involves significant engineering and problem solving, but it is driven by cultural concepts and aesthetics. In other words, it was designed with a creative pull as opposed to technological push.

Works of art tend to coalesce concerns, goals, and meaning, all of which evolve at multiple stages in the work's evolution. These stages include the initial planning and design phase and the continued iterations of transforming the design during production. Many times implicit meanings are recognized only once the work is complete, either by the artists or experts in the field whose job it is to identify what the artwork may mean. Cell Tango addresses a variety of concerns. It is an artwork that is about the creation of an archive, or collection of images – in this case limited to cell phone images. The project is based on the participatory, public contribution of data. Each exhibition represents a collection that is the sum of all contributions made by the public during the length of the exhibition. So at the start, the collection is empty; and at the end, the collection is closed. Each time the project is exhibited, the sum of all images collected during the exhibition's lifetime becomes the embodied visual archive specific to that event.

The research literature that relates to Cell Tango's foci of interests includes Kindberg's discussion on the ubiquitous transformative role of cell phone camera usage. [1] Lehtimaki discusses the increased use of picture taking from specialized occasions to the documentation of ordinary life. [2] Miller addresses the social network aspect of image storage sites such as Flickr. [3] Van House articulates a prioritization for image sharing as story telling, self-representation, self-expression, and documenting of everyday life over the long-term archival, collection opportunities that the photo management site offers. [4] The artist Golan Levin [5] has assembled a useful reference page of cell phone art projects, however most projects use the cell phone as a sound instrument in group performance, or else as control devices by which to activate events in site-specific locations, for example by turning on architectural façades with embedded LEDs. [6] The artist Jonah Bruckner created an early cell phone image-based work titled "Phonetic Faces" that consists of a mixed collage of images and portraits on a display contributed by the public present at the exhibition. This work used the cell phone to activate and control an onsite video camera that did the visual recording to a computer that assembled the images. [7]

The Cell Tango project may be understood as an exploration of the process of constructing and conveying meaning through the organization of visual elements (the images) according to a set of rules or conventions defined in the algorithms (the syntax) used to create the visualization. This positions the project within the context of a structuralist, cinematic tradition, as defined by the French film theorist Christian Metz in his analysis of semiotics and film. [8] Cell Tango follows the structuralist film theory model

of constructing meaning through juxtaposition, adding an uncertainty component as the aleatory selection of accompanying images are delivered according to common tag labels. The outcome of the selection covers a continuum from a pure literal, analogous matching visual content to visual content that may be totally unrelated at the literal, similarity level, but which may have implicit metaphoric or associative relevance. For instance, a tag that says “circular” might result in an analogous image of a tire, whereas another image which is tagged less literally with words like “yummy” or “sweet” might result in images of cell phones, cupcakes, chocolate drippings, images of a mug, a doodle, et cetera. One of Structuralism’s fundamental principles is that underlying structures lie beneath the surface or the appearance of things. [9] In *Cell Tango*, the algorithmic processes express the projects’ structure through its programmatic rules, and this functions as the binding by which the juxtaposed images in *Cell Tango* are organized. When the meanings between juxtaposed images are evident, viewers’ experience in fact becomes less interesting than when the meanings are harder to interpret. Humans naturally attempt to create and interpret meanings out of any information coming their way, and the less evident pairings turn out to be the most stimulating in the viewing experience.

The structuralist approach to art-making and information classification had significant influence in the 1960’s. This approach was initiated through anthropology (Levi-Strauss), and migrated to cinema (Metz), literature (Barthes), architecture, and art (conceptualism, Lewitt, Darboven, Baldessari), et cetera. Over time, the structuralist approach was challenged and rejected for its absolutist approach to the world, but it becomes of interest again considering that computational processes do function at the structural level to generate narrative forms through the articulation of rules.

Cell Tango features the interplay between two image sets: a) the ‘known’ system of the visiting public’s cell phone contributions, and b) the ‘unknown’ open system of tag retrieved associative images from the larger Flickr archive. At the start of the exhibition, the collection is limited to a few starter images, but then builds up throughout the length of the exhibition, and by the end of the exhibition, the collection culminates into the unique record representative of that installation’s specific set of conditions, visitors, cultural and temporal contexts.

Our interests in opening an account at Flickr were primarily utilitarian driven. Flickr is able to process incoming cell phone messages from all the various international standards. Flickr also includes a filtering mechanism by which sensitive content is managed to a degree. Additionally, we use the site for additional editing and for storing each exhibition as a set.

Cell Tango evolved out of an earlier museum-based data collection installation project titled ‘Pockets Full of Memories’ (PFOM) commissioned by the Centre Georges Pompidou National Museum of Modern Art in Paris in 2001 which then traveled to seven other cities (Rotterdam, 2003, Linz, 2003, Budapest, 2003, Helsinki, 2004, Manchester, 2005, Frankfurt, 2006, Taipei, 2007) each having its own variation based on cultural content defined through location and audience. [10] It consists of a data collection stage where the public first submits personal objects using a scanner and then describes and categorizes the object by answers a series of questions using a data entry kiosk station. These scanned items and their associated data are arranged using a self-organizing mapping algorithm. The algorithm spatially clusters the collection of contributions whereby each object is surrounded by other objects that have the greatest semantic compatibilities. It becomes a form of emergent organization where local relationships create a global order with each object is spatially positioned to every other object in the set according to their individual semantic value. *Cell Tango* grew out of the artistic, cultural, and computational concerns of PFOM, but aims to alleviate the burden of site-specific data entry. There is no need to

be physically present in front of a data entry kiosk station at an art installation. Using the cell phone, anyone, from anywhere, can submit a contribution and interact with the project.

The artistic requirements of Cell Tango necessitated the creation of a robust software implementation that allowed effective user interaction via the cell phone, animation of the visual elements within the different scenes, and the extensibility and adaptability to add new scenes and to easily relocate the project in different environments. Cell Tango visualizes an evolving database of cell phone photography and it is itself an evolving project that changes according to the venue, but also in order to explore new ideas and representations.

The system is separated into four processes that run simultaneously: the data gatherer, the visualization modules, the local network management component, and the graphics renderer. Communication between these processes occurs through writing and reading from concurrent data structures, which efficiently and safely allow multiple threads to access and update the same information asynchronously.

Because the main user interaction with the system is done through submitting cell phone photography, a primary technical goal of the system is to retrieve new photos as soon as they are available. Another goal of the project is to explore the relationship between the user-submitted photos and the related public photos. In order to facilitate the rapid retrieval of new photos and the exploration of related photos, a data-gathering component is placed in a background thread that continually checks the Flickr database. The process gathers both user-submitted photos and tags, as well as related photos from the public Flickr photo pool that are related to the user-submitted photos via their folksonomic tags. A local data store is kept in memory that holds the most recent user-submitted photos and well as selection of photos selected from the pool of other, less recent, user photos.

The system uses a custom 3D graphics framework called 'Behaviorism' [11] which loads each of the photos on to hardware-accelerated textures and also provides a robust scene graph and a sophisticated set of animation and timing techniques that control the layout and narrative of the different visualization modules. Each of the visualization modules processes the data that has been placed within the local data store by the data gatherer. Visual elements based on this data are placed on the scene graph, and then rendered via a dedicated rendering thread at sixty frames per second. Animations of the movement, size, color and structure of visual elements, as well as the movement of the camera view, can be programmatically defined by adding behaviors to the timing graph. These behaviors update the objects in the scene graph at the start of each loop of the rendering thread. In addition to using hardware-accelerated textures for rendering the photos and text, each visualization module is able to use OpenGL for advanced graphics techniques, including binding to custom GLSL shader programs. Because we have had to evolve and adapt the Cell Tango project to new environments (and expect to do so further in the future), the software system is designed to make it easy to add new visualization modules that transform and visualize the photographs and tags in novel ways. Additionally, we have experimented with the sonification of the visualizations, and have developed a networking component for propagating visual or data events to another computer that transforms these events into algorithmically generated composition.

Following the 2006 premier at the International Society of Electronic Arts in San Jose (under a different title, 'Global Collaborative Visual Mapping Archive'), Cell Tango has been featured in a variety of venues that include: an opening event at a national theater in France; a month in a commercial gallery; a long media arts exhibition at a West Coast research university gallery; a 2 month exhibition at a public Mid-

western university; and a 4 month exhibition at an East Coast private university. While Cell Tango functions primarily as an artwork, it also is a research project in the study of how the functionality of photographic image-making is changing through cell phones. Each exhibition is a data collection environment as the public submits images, which are then stored for later analysis. Each venue has its own socio-economic/cultural context with some noticeable differences. User responses revealed that images were expressive of local community interests, social perspectives, and varying degrees of implementation of the functionality of photographing, from recording special events, to recording phenomena, or idiosyncratic expressions. Additionally, there is the play between the collection of submissions through the artwork's context, which is contrasted to the public images retrieved from Flickr through the associated tags submitted by users.

Since the Cell Tango exhibitions act in one sense as a process of data collection, the next obvious step is to carry out the analysis of this collected data, which we plan to do in the future. We expect Cell Tango to continue on its exhibition life, each time new adding new datasets of user-submitted images. Cell Tango came into being at a time when we are witnessing the exponential changes in cell phone technology. A key component of this project will be the analysis of the various datasets to reveal the correlation between the cultural and technological elements as they change over time.

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FOODPOWER

Franca Formenti

The world in which we live is an integrated system of information in which we participate as consumers, increasingly unable to experience the immediacy of what we find standing before us.



Tommaso Arrigoni 2011. Author: Franca Formenti

FOODPOWER

work in progress

<http://www.foodpower.it>

<http://www.wikifood.es>

Online recipe project

Premise

The world in which we live is an integrated system of information in which we participate as consumers, increasingly unable to experience the immediacy of what we find standing before us. For us, reality is experienced through the media, is constructed by the media, which make events, places and people whom we have never seen or met familiar to us, and compensate their artifice by giving us a feeling of immediacy of that “dramatised” reality. At the same time the media bring about a sense of nostalgia for reality, a need for authenticity, spontaneity, physicality. There is a paradox: the media tell us that they manipulate reality, but the media also spread their accusations of their own falsifications. In other words, we live in a society where even immediacy is a construction.

The case of wikileaks is exemplary of this double movement of the unveiling and dramatisation, of a staged immediacy by the media: an international not-for-profit organisation, Wikileaks, uses a coded system to receive anonymous and secret documents, to then upload them on a website. In other words, a un-transparent process where unveiling means to cover up something else (the anonymity of information, ways of checking the authenticity of the materials...); but through this website, we can find a “mediate” user with a responsible, ethical and critical identity.

A mediate reality is a reality where modern distinctions between public space and private space have very blurred boundaries, and concepts slip between one and the other, emphasising the need for safeguarding privacy at an institutional level but also as part of the media.

In such a context, secrecy is transformed from an object of desire of our collective imagination into an obsession for those who are more exposed to the media. In this way, privacy becomes a luxury for the few or for those who have the means to protect their own data from the omnivorous indifference with which the media metabolise them.

Concept

The project that I am proposing must be understood as a strong metaphor of the analytical and philosophical premise, concentrating on the following aspects: familiarity/difficulty of direct access to media legends; artifice/desire to encapsulate authentic experiences; un-transparency of the dynamic of veiling/unveiling.

In order to emphasise the omnivorous character of information and the necessity to metabolise it in order to acquire an identity, I targeted my research on the body, on food, on the legend. To reduce the body is the first movement of the concretisation of the experience, to feed is the physical expression of vital growth, to elaborate legends is the principal operation of language and communicating in the veiling/unveiling process.

At the core we find the mouth, a bodily organ used for introducing/injecting and consuming, the organ with which we exchange material and spiritual foods, real foods spiritualised in artificial delights and foods with the spirit=ideas that are materialised in recipes, quantities, data. The mouth is the cavity of

the tongue and the base of taste, the organ of technology of the word, the first medium that is freed for communication between human individuals,

The tongue maintains the finesses of taste and the omnivorousness of communication.

As an example of familiarity and at the same time unfamiliarity of the legends of the media, I will take the category of chefs, the new demiurges of an increasingly common aesthetic in daily life, who are exemplars for their capability to manipulate food within mediate/experiential contexts.

The idea of identity will be identified through the portraits of the chefs. Every chef will accept the fact that he/she will be photographed in a portrait where they “stick out their tongue”, in other words exposing their tongue to the lens: this is to emphasise the symbolic importance of it, and also to use it as a metaphor for creativity as a ludic activity, irreverent and non-normalised (inspired by the famous portrait of Einstein), but also a reference to the medical test that doctors perform on small children to check their “inner” health. Wisdom and taste.

Every chef will give me an original recipe, written by hand on a piece of paper. Even the request for hand-written materials focuses on identity, as handwriting is a characteristic of every human being, just like finger prints, to the point that it can be part of a scientific inquest through graphology, which is capable of revealing identities and intimate characteristic of the person who is writing.

In order to give a theme to the reliability of the personal experience of what is often easily created on a mediate level, my artistic work will be presented online: the online connection will be the only way to discover and experience the recipes of various chefs who collaborate. On a website the names of the chefs will be put into alphabetical order, and by clicking on each name his/her portrait will appear, seemingly normal, but instead the image will be a steganography.^[1]

In order to de-code the image and discover the hidden text underneath, users will have to download a very simple program, which will give the possibility to read the “secret” recipe.

It will be a very simple operation because my objective is not to transform my work into an unnerving code-programming exercise, au contraire! It will be an invitation to reflect on the concept of privacy through games and cuisine.

PROMOTION

A concept on the mechanisms of communication would not make sense if it was not accompanied by an adequate use of means of communication and distribution. Therefore the disclosure and modalities will have to be studied carefully, so that it can obtain much visibility, can create interest and stimulate participation.

p.s. I want to emphasise that despite the fact that a portrait with a tongue sticking out can perhaps seem unbecoming, and may accentuate physical defects, it will be of utmost importance to me to exalt the aesthetical side of the image, because the concept of beauty is part of my research: “beauty” intended as a form of seduction that takes one back to oneself.

And anyway, as another guarantee for those who are photographed, every image will be chosen with the chef involved each time, so that they can be convinced and satisfied of their photo. I will also give the chef the possibility to decide how they want to show their tongue so that the collection of portraits is not repeated with the same gesture.

After having completed the online recipe book project, as I was gathering the recipes and the portraits of people with their tongues stuck out, and I thought that the peculiarity of steganography, which is a specific technique for hiding the existence of a coded message, could be a different way of creating a social network which could be revisited and destructured and that, in contrast with facebook, which violates privacy, will use similar dynamics to a classic social network but with the difference that the profile image can become a kind of medium whereby to exchange secret messages.

This curious and playful characteristic creates a buzz with other users who will want to become increasingly skilled at using the software programme, which is steganography, using it not only on the website which hosts the recipe book made by some young European chefs, but also participating in it, uploading their own image with a hidden recipe, even if this choice will remain optional within the social network.

Therefore this would be an attempt to offer a service through an artistic piece of work, where the users will find themselves faced with a different way of using a social network without the risk that their own privacy will be violated. Another peculiarity is that the users will be able to connect facebook to wikifood so that they may take advantage of the popularity of the top social network in the world, therefore sharing photos and posts on their wall automatically on facebook, so that it becomes a means for the promotion and sharing of wikifood which is a kind of parasitic economy concept typical of capitalism in our current society.

Then I thought, instead of adding the feature of clicking whether you like something or not, I will add the option "friend or enemy", therefore after asking for a user's friendship, by accepting the request the other user will decide whether to put their new friend in their friend list or enemy list with the added bonus of being able to de-steganographise the image if they are a friend, whereas enemies will not be able to.

It's evident that this new option is a bit contradictory because the symbolic value of steganography is to hide a ciphered message, therefore its existence is hidden whereas with cryptography, which is often used to exchange messages, it is evident that messages are being transmitted, albeit in a ciphered way.

The choice of informing one's enemy of the existence of a ciphered message behind an image was adopted to create a playful environment where the user, looking for a challenge or for a bit of fun or to quench their curiosity, will slowly learn how to use steganography, transforming the virtual environment into what could be considered to be a "gym" where one can practice and train, as well as being an interactive theatre which continues to grow and develop.

In all of this architecture of images, software and interactivity, the food and chefs remain at the foundations of the project, because in our current society they have a very special appeal and therefore in my opinion remain an excellent instrument to invite people to take part.

As far as the legal aspect goes, wikifood will ask users to sign so that they can register, it will not be the same process as facebook or other social networks which clearly collect personal data to then sell them

to other companies, but rather is dedicated to not selling data using some of the rules of the creative commons where the content and the photos will be the intellectual property of those people who produced them and published them on wikifood and if they should be used by wikifood, the user will be informed.

In the specific case that they should be used by other users who are registered with wikifood, wikifood will not be held responsible for such actions.

The last but not less important characteristic is that the recipe which will be de-steganographed will not go through the server. Aruba was chosen because of the previous violations of privacy and possession of data, but Claudio Agosti made sure that the steganography software that he created gives the possibility to the user to read the recipe without it going through the Aruba server.

I think that this detail is very innovative, almost visionary, mostly because the internet will be increasingly less secure and privacy will continue to be violated, therefore users will be able to educate themselves in a playful and artistic atmosphere, which can only be a good and useful thing.

Claudio Agosti created the steganography software, whereas Fabrizio Mascheroni is at the heart of the technological side of the project, creating the software, infrastructure and graphic design of our social network. Chiara Rusconi takes care of illustrations. The name of the online recipe book is HYPERLINK "<http://www.wikifood.es/>"http://www.wikifood.es

Steganography Software to hide one image inside another

WHAT

The software is called "rabbisteg", it's a steganography software. In order to work it identifies all of those bits of digital information which, even if they were lost, would not deteriorate the image. Once they are selected, it substitutes them with those of the image which is to be hidden within it.

This is the process of steganography, because the result is an image which, in the eyes of the observer, be they human or digital, looks completely normal.

This must not be confused with cryptography, which generates content which cannot be read by a human being or a machine that are not capable of deciphering it. In this case, on the other hand, it's not just privacy that we obtain, but we actually hide the existence of data.

HOW

Normally a steganography programme analyses the content of a file in detail, it understands its multimedia format and identifies those bits that can be sacrificed. This can be applied to video or audio as well as to images. Every format which contains the "quality" or "high definition" concept maintains its sense even if its definition is diminished. Steganography can be thought of as a controlled degradation process. The bigger the content that needs to be hidden, the higher the degradation will be.

This normally used to be done with software that needed to be downloaded, installed and used by both communicators. Now it has been implemented in javascript: every website can implement it and can consent to have its users use it. It's innovative in a way that web innovations are: in the beginning it's useful for web developers, who then make their own ideas with it and use it.

Steganography existed in ancient times, but it was never implemented in an easy way for its users. The Internet has reached new heights of user-friendliness and usefulness. The challenge of the software, released under a free licence so that it is freely available to integrate into any website, is to see whether steganography can be shared in this way.

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MAKE IT VISIBLE!

Fabio Fornasari & Sveva Avveduto

We present the first results of a research project, that studies and produces objects to implement new models and perspectives of art in education and research. The part we present is a medium, a narrative technology in constant evolution. We use a narrative path as an experimentation field to test and verify connections between social space and the construction of world images building a specific language in the narrative dimension of research.



Fig 1. Screen layout of the images found in the selected period in the browser MAKE IT VISIBLE©



Fig 2.



Fig 3. A confirmation of what is supposedly from the reading of images. The internal roads in the country are organized on the visual center of the tower. Another highlight from the series of photos: unmarked roads are reconstructed from the vision of episodic photographers that load on the network.

There are questions that we attempt to answer since a long time. What are the real challenges of contemporary art? What are its relations with society, history, culture, science and technology?

Where will our "obsession" for interactivity and technology lead us? After the consumer society and the era of communication, does art still contribute to the emergencies of a rational society? How art resists dominant homologation? Where is the conscience? And then, how do we remember?

Science approaches results by theorems, almost aphorisms, the literature builds sinuous prose. But sometimes the opposite can be true and the language of science is almost poetry. Art communicates with us through a visual and tactile thinking. All this revolves around one goal: to enlighten the reality, make it perceptible to our senses.

The task of this work is just that: to make visible our "conscience" settled into the Net, following its tracks into "a time".

Making the invisible of science visible, occupies a good part of contemporary physics and astrophysics at first through the inductive reasoning, then through technology. Making reality more visible through technological and artistic tools is part of our work.

Explaining what we intend to do could be very simple: a search engine that operates on a stock of images uploaded to the Net, and aggregates them in "paths" that are tied to space and time. But we believe it is interesting to argue the meaning of an operation that sees the world as a building site that produces images in continuous construction.

This work stems from a simple idea: it is impossible for humans to understand their long history without being aware of how over time they came together around the forms of consciousness that are the result of continuous sedimentation.

This is what in general we call culture.

In the formation of culture, has had a significant role both the study of the reality of things, and the making a series of conceptual tools that have led to the identification of samples, examples and models that, once defined and verified, we have been able to use as samples, as a real measurement system to watch and observe everything around us according to this ideal.

The encyclopedia and the museum have been considered the two major conceptual tools, real architectures that have the task of giving structure to knowledge, make it visible and shared for a common review, to represent the models to be used to make comparisons.

The reality in all its forms can be measured and subjected to reference models.

This view of knowledge and culture is coupled with a vision of science ready to prove everything through the experimental method, towards a unique result. Since several decades we have a different awareness: science is not able to provide conclusive evidences, it is always falsifiable. Rather it is a means to understand the world and the universe around us, and then it adjusts continuously (Tattersall 2008).

If we intend to think about the history of culture, of mankind and its step on the skin of the planet, there are no experiments to conduct. Only one thing is possible: we can only observe the traces left behind, and put into a continuous relationship past and present. An interpretation that has a relational attitude: only through a system of qualitative and quantitative comparisons of the traces, you can have an interpretation of cultural history (Diamond 2006).

The styles of scientific and humanistic thought require mutual interpenetration.

There is no discontinuity in what happens around us. The idea that science and philosophy or, more generally, all the humanities are separate, falls into an old approach that divides fields of science and reasoning, that has no sense nowadays.

Technology is designed as a means to reach an end (Brian Arthur 2011) and in this sense, language is a technology which in turn uses other technologies. What we learned is that all technologies are set all together. Are not concluded in their external form, but there is continuity with other technologies included in them, combined.

For technology we mean a combination of knowledge, practices, techniques that come from applied science, communication and art.

In this sense we can say that we are writing more and more using technologies. And we also refer to technology when we talk about images: those related to the production of photographs, those related to the loading of them in the various social networks or institutional sites that host them. We refer to them also when we use a tool that allows us to navigate this body of images over time, associated with the space in which they were produced. Google Earth or Picasa, for example.

We're not talking about a hard technology, a technology that tends to overcoming the idea of "human" in a key of "body". We are rather thinking of a software, a search engine that thinks for us, and with us, the way we look at things stored in the Net. We are no longer in a time where you must fill out the Net of contents, but in a time where you have to work on the quality of landscape produced. You must make your way through this vast sea of contents uploaded on the Net.

After all, the sense of this work is to provide a tool to reconstruct the tracks within the historical context of the visions in the network path, and how this activity leaves us a legacy to continue to live the present and the future of our dwelling in the world.

Facing through pictures, routes and maps of the most interesting topics appeared on the Net. Following the joints of the medium over time, its constants and its evolutions. These are the aims of Make it visible, an atlas that seeks to make explicit the links of the vision, to look at the world with technology, geography, travel, literature, theater and other media, as well as with social relations, spaces, rituals. In other words, the consciousness of a place. This work establishes links and correspondences between images, photographs and geography, related to a time that is not just accumulation, but that can be browsed, scrolled and get across. Like a time machine for the visions.

The nature of this work would be to tracing a path.

A road in the visual consciousness of the world. The place of consciousness is the dynamic life of the whole person or the whole animal immersed in life itself.

Human experience is never alone: it takes place in the world with other individuals. The process of consciousness, as that of life, is a dynamic process that involves the world. We are at home in our surroundings. We are out of our heads.

Science, just like history. It can not be taken for granted, firm, fixed. The historical discourse is never born, it always starts again anew.

Why this focus on time, history and its way of developing?

Technology is the result of project, of design, and any technology, any design process is defined first of all in relation to time and place in which it was produced.

The pictorial turn is also well established: the images are considered by any science and discipline a proper language, turning upside down the view that considered images as somewhat misleading, as bearers of a degraded knowledge (Mitchell, 2007)

This change has now led to a simultaneous presence, visible to anyone, of the drawer full of photographs taken on the planet.

The meaning of the images is intimate and internal to the same image. But today we are interested in having the perception of a consciousness that is shown in the world and on the world.

Once the photos were just "snapshots". Today the use of geo photos made the same world a "snapshot". But living the instant removes time. And it is his limit. It leads to forget to put the space of vision in the appropriate time.

What is needed is a thought that may find in a technology a tool to make sure that all this does not become a trash for narcissistic images, but the image of same consciousness of the world. Metaphrasing-Wittgenstein: if he thinks that the human body is the best image of the human soul, then the collection of visions of Panoramio, taken as a "corpus", that is the selection and organization of the whole "corpora" that have a qualitative relationship, is the image of the consciousness of those who live in a place.

An image, produced as a thought full of meaning, emerges only if you keep the whole body immersed in its environment, dynamically.

If the avatar embodies our being in the Net taking us away from our real body, the many visions that each of us now deposited in the Net, in the "virtual" (digital) dimension of planet Earth, are more and more referring to the reality of personally experienced situations, in other words are pieces of consciousness that join with those of others within a timeless mosaic, that has lost the very idea of time. The reality in all its forms can be measured and subjected to reference models.

For centuries we have discussed the idea of presence and the idea of simulation and simulacrum.

In the act of depositing a visual memory, the idea of presence is already inherent in the vision that allows to offer the image the vision to everybody, on the one hand narcissistically, and on the other as evidence of an act of conscience and an act of living and inhabiting.

We are no longer at the dawn of that time. We are inside its adolescence. We are growing inside that time, and on growing we feel the need to organize things differently. To compute, for example.

But which images are we talking about?

We are not taking care here of images of high cultures, of painting, for example, but of the images produced on travelling, the images associated to leisure, to a glance made free from the history of photography.

In this sense, the idea of continuity, vicinity, fractures and survival, that, after Warburg, we apply to the world of images, changes its status as images are often linked to the daily visions or visions of the sublime (meaning the emphatic visions that the public shares on the Net, for example those of sunsets. The landscape reinterpreted in a postcard). People shoot pictures having in mind images taken by others, that often become survivors in their visions. Images shared and participated.

The images speak and make us speak. Always. But the images uploaded to the Net, are not a synthesis, are things not acts. Acts performed by anyone, without giving them any merit. Thanks to the Net and its resources, this is the time that seems to have given at least one answer to the problem of becoming visible. At the beginning of the third millennium, this need has been solved for any representation. If for someone the goal is then to see everything, but also to have everything, for the anonymous crowd it is just to be seen (Virilio, 2005).

All this is now possible and it is even more not only as an opportunities but also as an experience.

The word experience includes thinking, feeling, as is manifested in the perception of the world before us.

The earth, our planet, thanks to technology has become a thinking thing. Our consciences are intertwined, interconnected. But we need historicizing in order to build a sense of all this thinking, remembering, otherwis it is nothing more than background noise.

Any science can not do without using the tools needed to perform research.

These instruments are the result of sedimentation of intelligence applied to building them. In other words of technology.

In front of an image, we are always facing the time (Didi-Huberman, 2000).

Looking at pictures in the Net is like looking at the frame of an open door: it is not hiding anything.

Any image, as recent it may be, finds a re-signification through time. The image becomes the object of a special obsession that binds its meaning to a past that constantly reconfigures it. This happens for every single image placed on the Net.

The construction of meaning in memory, builds up a new meaning to the viewer. It puts at stake the consciences of the beholder and of the picture felt as consciousness, as perceptive experience that represents the world as it has been seen.

Perhaps what we are presenting in the end is the disease which claims to be his own therapy: look, see, recognize!

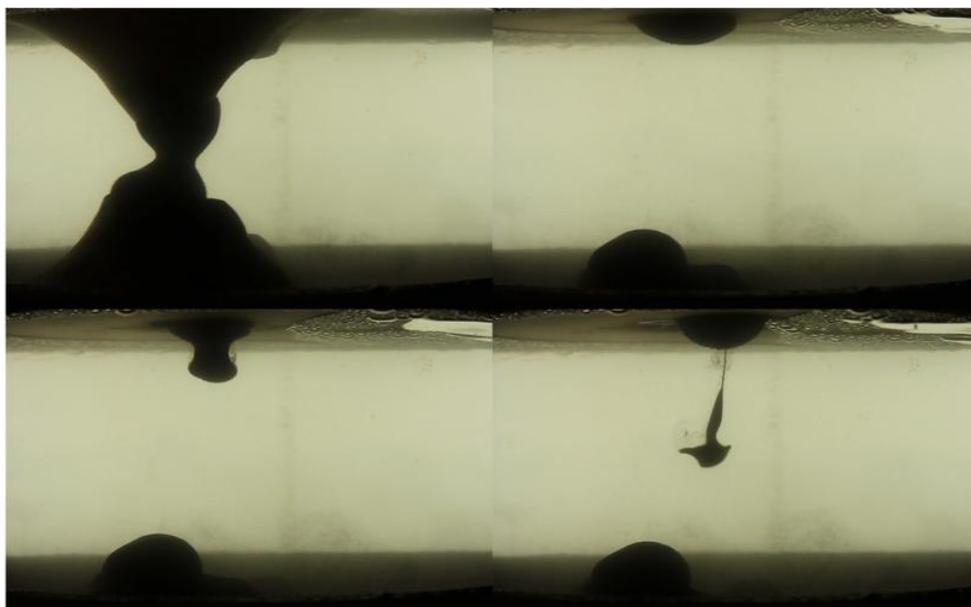
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DYNAMIC LANDSCAPES

SARA FRANCESCHELLI

I will illustrate a performative design research program, based on a structural (albeit dynamical) interpretation of the figure of landscape in theoretical biology. We are interested in the dynamical properties of landscapes to be instantiated by the behaviour of designed devices: we are working on a pragmatics of landscapes.



“Paysage magnétique”, february 2010, in the framework of the workshop “Dynamics of a Landscape”, in collaboration with the research program Dynlan. Students: Maia d’Abboville & Ferdinand Dervieux. Copyright ENSAD.

Morphodynamic narratives

ONE. CHANNEL

On a tensed membrane presenting maxima and minima, balls of different size are falling down. Sometimes they stop in local minima of the membrane. A second tensed membrane lies under the first, and they are connected by a channel.

TWO. TECTONICS

Potentially interacting agents are irregularly distributed on a plan network, at rest. They attract each other whether their distance is equal or less than a critical value. This condition can be produced, for example, by an external perturbation. Their topological disposition may thus change, and the global form of the surface be modified, folds appear.

THREE. A NETWORK OF SINGULARITIES

Imagine a network of singularities, dispersed in the three-dimensional space. Local maxima, local minima. They are interconnected. This connection is materialized not by linear links, but by surfaces. As in a dance, each equilibrium is nothing but a frozen instant of a global morphodynamics. An equilibrium can be destabilized, following certain tendencies. A local maximum can become a local minimum, while other unstable and dynamic equilibria are deploying their connection surfaces. We assist to a – periodic – revolution of the mutual equilibria.

FOUR. FLUID SCENARII

Insistent attempt of an encounter. Pressure. Resistance. Crossing a threshold. Modification of the form. Explosion. Surge. Fall. Dispersion. Extinction. Agglutination. Da capo. (Fig. 1)

Each of these morphogenetic narratives is compatible with one of the prototypes that have been produced in the framework of workshops on performative design held in ENSAD, Paris, inspired by the figure of landscape in theoretical biology. Some details on the context of the teaching and research experience in which these workshops took place are given in. [1] The idea was to provide to applied art students an introduction to the figure of landscape in theoretical biology through the presentations of some researchers in the field. A brainstorming with the researchers and with some teachers of the ENSAD - also involved in the project - followed this introduction, in order to help students in formulating a project of prototype, to be realized in the following weeks. In which sense the figure of landscape can be connected with morphogenesis and morphodynamics? And how can it inspire an experience of performative design?

The figure of landscape in theoretical biology

In every day language the term “landscape” has several acceptations. The most obvious are perhaps the ones referring to landscape as an expanse of scenery that can be seen in a single view: a desert landscape, for example, or a picture, or an artistic representation depicting this expanse of scenery. In our research, however, we are referring to another acceptation of landscape – we will not consider a material landscape or its image, but an abstract one that, nevertheless, also concerns vision: the landscape considered here emerges from contemporary science practice, it is a mental picture offering a theoretical view on morphogenesis and morphodynamics in systems composed by interacting agents evolving in an environment.

From the theory of evolution to embryology and statistical physics, the “landscape” metaphor - qualified as “adaptive”, “epigenetic”, or “energetic”, depending on the domains under consideration – presents a characteristic shape defined by peaks, pits, and cols. An example of recent interdisciplinary research in theoretical biology dealing with landscapes is given in Armando et al. [2] These figures played and play an important role in the development of biology, from population genetics and evolutionary theory to embryology and epigenetics, since they entrance on the scientific scene during the 1930s. On one side, the adaptive landscape, introduced in 1932 by Sewall Wright, one of the founders of modern synthesis, is described by this author, as a

“diagrammatic representation of the field of gene combinations in two dimensions [...]. Dotted lines represent contours with respect adaptiveness.” (from the original caption) [3]

In this representation the dynamics of mendelian populations on this surface is expected to go towards local maxima of fitness. On the other side, the epigenetic landscape introduced by Conrad Hal Waddington is qualified by Waddington himself as a mental image, a representation by a diagram of the developmental system of an embryo:

“Although the epigenetic landscape only provides a rough and ready picture of the developing embryo, and cannot be interpreted rigorously, it has certain merits for those who, like myself, find it comforting to have some mental picture, however vague, for what they are trying to think about.” [4]

From a morphological point of view, the common shape of these landscapes (hilly surfaces) could suggest an analogy with the images of potential or energy landscapes for dissipative systems in mathematical and physical literature. However, Wright himself affirmed years later the introduction of his landscapes, that he did not meant to give them this mathematical connotation. He was indeed interested in suggesting a visual metaphor and in using its rhetorical power in order to render his own theory more understandable and to promote it in the wide community of not mathematics trained biologists. If in the case of Sewall Wright’s landscapes images served manifestly to visually illustrate his already mathematized theory, I argue that the epigenetic landscape plays, with respect the theory it should represent (on embryo development), an inverse role: it is not an illustration of a theory, but in some respects an anticipation – an anticipation of its expression in mathematical terms. As a composite metaphor, involving variables at different spatio-temporal scales, it contains a call for mathematization of developmental processes. This interpretation of the figure of the epigenetic landscape, with all the potentialities it offers, lead my choice to build a teaching and research program at ENSAD on morphogenesis in an art-science perspective (see also papers by Jonas Ranft and Jiang Bin & Sara Franceschelli in this conference).

How to say mathematics with images

In Waddington’s 1957 version of the epigenetic landscape a ball, lying on the top of an undulated surface, is ready to move along one of the paths opened in front of it. This image is completed by a “hidden” part, underlying the undulated surface: a network of pegs fixed in the ground, interconnected, often in a redundant way, by guy-ropes and strings. Tension on the links (guy-ropes and strings) is finally assured by the fact that some of them are connected to the inferior side of the surface (imagined here of non-zero thickness). The form of the undulated surface is thus seen as the emergent effect of this complex set of relationships. This suggests that a change in the tension of a link (that could be provoked by a variety of factors, for example an external perturbation, a modified tension between two or more pegs, or other...) could modify the form of the undulated surface, thus creating a new path, a new possibility for the balls to be chosen. On another side, one can also imagine that some tension modifications could be balanced by other modified tensions, so as to leave unmodified the global tension game on the undulating surface. This would imply that the paths offered by the undulations of the surface to the balls routes would not change, despite the underlying local modifications. And this could be seen as the guaranty of a certain form of robustness for the dynamics of the balls. Now, what could this image represent? Waddington states it explicitly: The undulated surface represents the fertilized egg. The path followed by the ball represents the developmental history of a particular part of the egg. As far as the underlying part, the epigenetic landscape turns out to be a composite metaphor, offering an explicit and mysterious at a time interpretation of the constitution of the surface itself:

“the complex system of interaction underlying the epigenetic landscape. The pegs in the ground of the figure represent genes; the strings leading from them the chemical tendencies which the genes produce. The modeling of the epigenetic landscape [...] is controlled by the pull of these numerous guy-ropes which are ultimately anchored to the genes.” (from the original caption) [4]

This figure points out at least two aspects of Conrad Hal Waddington vision of embryology:

- the development of the embryo is canalized along defined pathways
- the undulating surface on which pathways, or channels, are defined, is moulded by the underlying network of genes interactions.

Waddington’s non reductionist position vis-à-vis single gene action is explicitly stated:

“it is not necessary, in fact, to await a full understanding of the chemistry of single genes before trying to form some theoretical picture of how gene-systems produce integrated patterns of developmental change.” [4]

Moreover, Waddington compares the genetic actions on the whole to the geological structure moulding the valleys of the landscape: beyond the field of embryo development, structural and morphological thinking is inscribed in Waddington’s images. And this is the aspect that our research stresses.

What do landscapes do?

I argue that they call for a mathematization, setting the agenda of what a good mathematization of development should take into account. They also suggest the ingredients (non-linear dynamics, sensitivity to initial conditions, networks...) that could be at work. The mathematician René Thom, father of the catastrophes theory, inspired himself from embryology, and from these images, to create his mathematical theory. Catastrophe theory is a general theory of morphogenesis, intended as the creation or the destruction of forms, without regarding nor the substrate, nor the nature of the forces that determinate it. Waddington and Thom have been involved in a long correspondence, about a possible mathematization of the epigenetic landscape in terms of catastrophe theory. The correspondence shows some misunderstandings both on the theoretical notions associated to the landscape and on the mathematical notions that could describe them. [5] Despite these misunderstandings, and even more because of the questioning they open, I argue that the image of landscape, if interpreted in a structural, albeit dynamical sense, is a call for mathematization. It inserts itself in the history of the use of dynamical systems theory in biology, use conveyed also by cybernetics (the relevance of dynamical systems theory for cybernetics was not unknown to Waddington). Thus, if we look at the images of epigenetic landscape not as referring to objects, but to processes, possibly grasped by a dynamic systems approach, what becomes interesting is their performative power, more than their representational status. If the term landscape has, in its most general acceptation, the peculiarity of designating both the thing and the image of the thing – the signified and signifier - in our research program we are interested in the dynamical properties of landscapes to be instantiated by the behavior of designed devices. In other words, we are working on a pragmatics of landscapes. The challenge for students working with us on performative design is to conceive prototypes which instantiate some of the dynamic properties of landscapes.

What is performative in performative design?

The idea is that the morphological properties of landscapes, in their dynamic evolution, defines narratives that one could try and produce through designed devices. These narratives - thus shared by images of landscape (thought as processes) and material devices - can be supposed to be interesting on the basis of their genericity. Therefore one can work on pragmatics, with the idea in mind to eventually come back to semantics, carrying out questions and insights from the observed dynamic behaviors. If we consider the morphodynamics narratives we began with, each compatible with the behavior of a designed material device, several questions emerged from observations.

As far as the first narrative, "Channel", inspired by the dynamics of canalization on a landscape, a possible question to explore is: Can the balls pass from the superior membrane to the inferior one, and how?

For the second narrative, "Tectonics", which has been realized in the framework of the workshop "Dynamics of a landscape", the questions we tried and ask to the functioning of the device were of the kind: Which are the properties of stability and of robustness of the folded surface - globally and locally? How does the device resist to external stresses?

The third narrative "A network of singularities" is associated to a device that has been realized by a group of first year students of ENSAD in 2008, in the framework of the workshop "Paysages sensibles et dynamiques" (co-directed by the ENSAD colleague and architect Yves Mahieu and myself), which has been inspired by the notion of deployment arising from the analysis of the Waddington-Thom correspondence ([6], see also [1]). Here we took the notion of singularity as the dynamic unit around which a complex deploying surface has been designed. We worked on the calibration of the parameters of the dynamics to obtain a periodic deployment of the surface itself. In order to go further and to work on a possible interactivity of the device, questions arise, such as: How could an agent evolve on this surface deployment? Will there be any interdictions? Any ruptures? Any holes? What else - who else could take part to this dance? Interactive potentialities of this device are to be explored.

Interactivity perspective has been further explored in relation with the fourth narrative, "Fluid scenarii". This is associated to a device, "Paysage magnétique" (realized by two students, Ferdinand Dervieux and Maia d'Abboville in the framework of the workshop "Dynamics of a landscape", Fig. 1), that has been conceived following the idea that, in a generic landscape, the ball, coming from the image of the epigenetic landscape, could be a modifiable element, too. The behavior of the conceived device, in response to user stimuli, raised the following questions: Are there recurrent morphologies in function of external stresses? Can we recognize recurrent histories? And try and obtain them again? Here, thanks to the exploration of the responsive dynamics of this device, under the effect of external stresses, we found pertinent the use of the notion of "scenario", coming from the study of dynamic/complex systems transition to chaos.

In the study of dynamical systems from a mathematical point of view, as soon as non-linearity is implied, and there are more than three degrees of freedom - as it is well known since Poincaré's work on the three bodies problem - predictive power of equations is not guaranteed. In order to make some predictions on the dynamics of this kind of systems, the question of establishing a good representation of the phenomena thanks to the equations is not enough: one needs to know the history of the system, its behavior under the effect of the variation of some control parameters: what does the system perform spontaneously in time, and under the effect of its parameters variations? Are there generic scenarios,

defined by generic series of bifurcations, that one can recognize? Our experience of performative design allowed us to explore this set of questions by observing the dynamic behavior of the “Paysage magnétique”, in response to the user actions.

Discussion

Without explicitly writing any equation, these performative design experiences lead us at the heart of the questioning about dynamic and complex systems behaviors, that the figure of landscape synthetically grasps. We followed the idea of not designing objects, but processes generating families of objects. From a practical point of view this has been translated in designing parameter controlled devices. We worked on mechanical, analogical devices without using the digital as a source of morphogenetic research. We worked on a qualitative basis, but theoretically there is no opposition with digital, morphogenetic research flourishing in architectural and design research, as for example in the work of Mark Burry, Hachim Menges, Michael Hensel, Aliza Andrasek... The tension analogical/digital, that we will explore in our further research, is not but a reactualization of one of the founding debates at the core of cybernetics, and still of great pertinence.

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FLO)(PS : BETWEEN HABITUAL AND EXPLORATIVE GESTURES

Karmen Franinovic

The perceived affordances of an everyday object guide its user toward habitual movements and experiences. Physical actions that are not immediately associated with established body techniques often remain neglected. Can sound activate those interactions that remain latent in the physicality of an interface? This paper presents the Flo)(ps project, an ecology of interactive cups that aim to engage strangers in non-verbal communication.



Fig 1. Girls drinking lemonade and playing with Flo)(ps. Photo by Annie Tremblay. Courtesy of OBORO.



Fig 2. The Flo)(ps glasses are active only when filled with liquid. Photo by Karmen Franinovic.

Introduction

What we know how to do strongly affects what we do, what we perceive and what we are willing to do. Given a glass and a pitcher filled with water, we will most likely pour the water into the glass, although its shape suggests many other movements, such as rolling and throwing the object. The latter actions, however, are neglected because we do not associate them with glass as a functional object. Abandoning such functionality in the name of exploration and play can foster existing and new types of social interaction.

The unusual sonic objects within public setting can attract and engage the user in an explorative discovery of its potential for action. [2, 3] But what happens when an everyday object is augmented with sonic gesture? In the musicBottles project, for example, the user can play music by removing the cork from the bottle, having the impression of freeing a song from the object. [5] Using the bottle as a sound container, the user expression is limited to acting with its cork as an on-off switch. A more explorative sonic interaction with an everyday object can be found in the Audio Shaker project where sounds can be mixed by interacting with an ordinary cocktail shaker. [4] Users can speak into the object to record sounds, close and shake it to re-mix them and then literally, pour out the sound mix. The object challenges users' preconceptions about the purpose of a cocktail shaker through an unusual feedback. While the continuity of Audio Shaker's responses allows for a more explorative interaction than the discrete feedback of the musicBottles, both interfaces engage habitual actions: opening a bottle or pouring sound. But how can an everyday object guide the user toward the space of unusual and explorative gestures?

The coupling between action, sound and object seems to play a key role. The material aspects of an interface, such as its shape, weight or texture, afford an energy transfer between the body and the interface. When interaction is designed around such physical qualities and without reference to another known object, the user has to discover how to generate sounds. Such process of learning is enabled by coupling action to sonic feedback in unusual as well as in expected ways. [6] Whereas the former foster discovery, the individual repertoires of expected couplings are defined through shared, culturally encoded movements and shaped by specific personal skills, such as knowing how to skate or to play an instrument. My argument is that this existing bodily knowledge may serve as a starting point for unusual and novel embodied experience.

Flop)(s interactive glasses

The Flo)(ps are project explores habitual and explorative sound gestures with everyday objects, and their impact on social and personal interaction. It is a set of glasses that sonically respond to habitual actions such as cheering and drinking, but are also activate when certain unusual gestures are performed. Different glasses can establish connection among each other if synchronously moved in a similar manner. Their connectedness is manifested through sonic and light responses which signal to the users that they are affecting their behavior. The goal of such performative connectedness among glasses is to make strangers communicate with each other, through an everyday object, in an embodied, dance-like way.

ACTION-SOUND COUPLINGS

The design of action-sound couplings took place through bodystorming where sonic gestures were explored using different objects and materials. Individual use of the object and the interaction between two people such as throwing the sound toward someone were probed. This helped decide how to map selected habitual and non-habitual gestures to different sounds. The habitual gestures extracted from sensor data included filling the glass with liquid, raising the glass, stirring the liquid, drinking and toasting, while the unusual gestures comprised twirling, moving the glass very slowly and shaking the glass. Habitual gestures generated sound of liquids such as pouring, while unusual movements opened up unexpected sonic spaces such as the sound of the storm. The movement of the glass continuously changed the qualities of the sound in order to give the user the feeling of an ecologically natural experience - in

the sense of cause and effect logic found in physical phenomena. [7] For example, tilting the glass would make some virtual water come out and then stop until the user inclined the glass more in order to pour out the remaining water.

EXPERIENCE DESIGN

The glasses respond to the user only when they are full, and otherwise sit quietly waiting to be filled with the liquid. Once filled, the glasses begin to pulsate luminously and emanate the sound of water drops, each in its own rhythm: faster and irregular, slow and in patterns or slow and regular. Different responses aim to communicate specific identity of each glass - one is energetic and nervous, one is slow and relax, one is determined and clear. Their behavior is intended to attract the visitors: as they approach the glass the volume of the sound increases, and once the glass is grasped the dripping fades out. The habitual actions, which are expected to be firstly performed, activate sounds of liquid. Starting from existing action-sound repertoires, the user is guided into new movement spaces. For example, twirling the glass activates the sound of the wind. The wind sound grows louder and more complex if the user continues to twirl the glass.

When the movement is synchronous, same light and sound patterns are displayed in both glasses. The aim of using the light feedback is to establish visual link when users are too far apart from each other. The connective sound responses become stronger as the users move in the domain of non-habitual movements with the glass. In this way, the users may influence each other's movements through the sonic and light response of the glass. The goal of connected behavior of The Flo)(ps is to allow the users to collectively perform and "to dance" with each other stimulated by the sonic response to their gestures. [1]

EVALUATION

Considering that the main goal of the project is to connect strangers through performative acts with everyday objects, the evaluation aimed to reveal the social potential of the system and to gain understanding into individual experience of using the Flo)(ps within public setting. The artifacts were exhibited at the Oboro center in Montreal, Canada over three-week period at the International Design Biennale, St. Etienne, France over four-week period. In the Oboro exhibition the users could drink beverages from the Flo)(ps, whereas this was not possible at St. Etienne Biennale due to the large number of approximately 85.000 visitors. In Oboro installation, each of the three glasses was associated with an area of the bar below which the speaker was located. Chairs were used to keep the visitor's interaction bounded to that designated bar area. The drinks were served in the late afternoon and evening of each weekend, at the exhibition opening, events such as Journees de la Culture and special organized visits that lasted from two to five hours.

The range of social experiences that emerge within public context in large part cannot be predicted. [3] Thus rather than focusing on a specific task which could be quantitatively measured, we preferred to qualitatively evaluate user's interaction with the system without any previous instructions. We used questionnaires and direct observation including participant observation, design-adopted video ethnography and the informal interviews. These methods were applied sequentially in order to avoid guiding user experience through questions. Firstly, the visitors interactions were video recorded; then participatory observation combined with informal interviews took place; and finally, the questionnaires were

provided after the groups of visitors finished interacting. The data collected included more than six hours of video recordings, seventeen filled questionnaires and notes from the participatory observation and interviews with participants during the installation. [1]

SOCIAL INTERACTION

The average interaction with the glasses took fifteen minutes, although many visitors spend more time within the installation while chatting with friends and drinking from the Flo)(ps. Overall, the findings about the social dynamics emerging around the objects proved to be best defined from the analysis of the video material and the insights gained through informal interviews. A number of patterns were seen to emerge including:

- **Mirroring and Synchronizing:** Participants were observed to mirror each other's movements, especially when someone discovered a new sonic behavior, as if learning from each other.
- **Non-verbal Communication:** One visitor wrote: "you don't have to talk to connect with strangers since you are already linked by the sound you are making and also the gestures" and another visitor described sound as "an extension of body language";
- **Collaborative Performance** was observed, as groups of three participants aimed to collaboratively compose sounds. This often led them to ignore the sonic and light connections as they focused on musical improvisation;
- **Simple Play** such as creating sound of clinging glasses by toasting was repeatedly performed. Participants appeared to enjoy the simplicity and predictability of the direct feedback, but this sometimes appeared to limit further exploration of interactivity;
- **Curiosity and Discussion:** Participants proposed different interpretations of the objects and explanations for their use such as glass as a seduction tool or a waiter's help;
- **Ambient Display:** During the performance with the objects, participants would stop to talk to someone while enjoying their drinks. The glasses would fade into the background until the user's attention was drawn back to their responses and play was resumed.

These observations show that the installation forged interaction between strangers, through sonic and light gestures. The light appeared to have a stronger connection effect than the sound which often appeared to be too complex to interpret. The use of light rhythmically varying in color and luminosity had an important role in establishing contact and was necessary when the overall soundscape grew louder.

Some visitors expressed desire for simpler and clearer sound responses. The clarity of interaction may be improved by reducing the number of gestures and by using simple motions, rhythmical patterns or large movements that showed to be preferred by the participants due to their clarity. However, prudence is required as reducing the temporal evolution of sonic feedback to direct responses may lead to on-off behavior that could quickly bore the user. In fact, those participants who had interacted alone desired more complex sonic behaviors. Thus, one solution to be tested is to apply simple responses when more people are using the glasses and more complex ones when a solo interaction takes place.

INDIVIDUAL INTERACTION

The subjective aspects of the experience were best described within the questionnaires and in participants reflections collected during the informal interviews. The following behaviors emerged:

- **Expressive Solo Performance:** Most visitors experienced the object as an expressive instrument. When they interacted alone, the rhythm of the performance often slowed down as they more carefully explored the sonic behavior of the object;
- **Exploring the Unusual:** Participants found it difficult to interpret unusual sounds, but were satisfied that the sound continuously responded to their gestures. One visitor wrote: “swirling it in a slightly less habitual and functional manner, it opens up an unusual sonic space. The splashing sound seems to gain in resonance. Soon after a deep howling, evocative of a storm, becomes amplified;” [1]
- **Limited by Habits:** Few participants stated that certain assumptions about what should be done with the glass affected their experience. One participant wrote: “I was more focused on solitary interaction. I guess I assumed that all that could be done with the glasses could be done alone.”. Participants enjoyed small deviations from habitual events, such as toasting with glasses of different materials (i.e. plastic glass with the sound of crystal one);
- **More Dynamics:** Because the sounds did not evolve if only habitual gestures were performed, some visitors who played for a short time period said that the sounds should evolve or change more often;
- **Introspection and Intimacy:** Many visitors who were alone in the installation used the glass as a kind of meditation tool. They were observed to stare at the drink being illuminated by the light or to slowly twirl the glass while listening to the sound of the rain or the wind. One visitor wrote: “They remind me of candles. It would be cool if they reacted to the stress in your palms.”;
- **Strangeness:** Several comments suggested that the sounds confer the sense of strangeness. Participants associated sounds to “an imaginary chemistry lab”, “stalagmite space”, “a damp basement” and “outer space”. Others, however, linked them to personal memories such as “playing in bath as a kid” or “it makes me feel like I am underwater”.
- **Fun or Function:** The presence of liquid in the glasses showed to be highly significant in affecting and constraining the way in which users interact with the Flo)(ps glasses, and the ways in which they perceive them. If the glass was activated when no liquid was in it, it was interpreted as a musical instrument, a toy or a magical device.

When performing individually, the participants were more attentive to sensuous responses of the system. They explored more deeply the transitions between habitual and unusual gestures while forming new interpretations for sonic and luminous behaviors of the glass. The distribution of the attention of the user appeared to be central to shifting between different types of interaction. Although the user interaction cannot be predicted, the spaces in-between the solitary and collective performance and between habitual and unusual gestures need to be well choreographed.

Conclusion

I have described the design and the qualitative evaluation of the Flo)(ps project that aimed to stimulate connectedness among strangers through sonic movement. The goal was to explore the space in-between the habitual and unusual sonic gestures with an everyday object. Using a familiar object such as a cocktail glass showed to facilitate the first exposure to its interactivity, but it showed to limit the exploration of its behavior due to the assumptions about their use. Such objects proved to engage users in non-verbal communication, especially if the action-sound relationships are simple. Strategies for the transition between habitual and experimental actions still remain to be explored. The integration of the speaker in the body of the glass is necessary in order to improve usability and to conduct exploration within real-world context such as a dance club or a cafe. The next steps for The Flo)(ps project will focus on more abstract sonic feedback for habitual actions in order to break the expectations of the user and facilitate unusual gestural interaction.

Strangeness may be the key to exploring the boundary between the familiar and the unknown gestures, as witnessed by this reflection of one of the Flo)(ps users: "As I become immersed in my experimentation with the drinking glasses, their familiarity gradually becomes odd to me, in the way a word can gradually acquire a strangeness if we repeat it over and over again. This turn from familiarity to estrangement allows for a rediscovery." [1] It is my hope this project raised questions and awareness that such playful and embodied reflection can be stimulated and sustained through novel sonic experiences within our everyday contexts.

ACKNOWLEDGMENTS

Many thanks to Yon Visell for software development, Martin Peach for electronics advice, Fabienne Meyer and Thomas Tobler for fabrication support. This project was supported by the European Commission project CLOSED and the Interstices Lab, Hexagram, Montreal.

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MAPPING UNCERTAINTY

EUGENIA FRATZESKOU

The issue of exactitude in mapping the physical world has been debated extensively in science and has influenced the formulation of scientific paradigms. New types of site-specific digital art are developing for creatively investigating the intersection between various types of reality and their exchanges. This paper focuses on how it is possible to trace and interact with the emerging paradoxes, through innovative modes of spatial intervention.

The issue of exactitude in mapping the physical world has been debated extensively in science and has deeply influenced the development of scientific paradigms. According to Lev Manovich, a fundamental paradigm shift characterises the transition from Modernist reduction and abstraction to complexity in art and science. [1] As we pass from Modernist mathematical formalism to complexity, uncertainty and complementarity, our perception and understanding of the relationship between physical and virtual worlds are changing in the most unexpected ways. The developments in Quantum physics and scientific visualisation have revealed an emerging kind of multiple dimensionality that characterises the fuzzy boundaries between reality and virtuality. As a result, a new understanding of space and reality in general, as well as of the limitations of science, is developing. A closer investigation of what is understood as paradigm shifts, may show certain ambiguous interchanges between reduction, abstraction, complexity and complementarity, in a context where not even a single definition of complexity seems to be universally accepted. This situation is most revealing of the inevitable limitations and shortcomings that characterise our attempt to study and map reality.

The creation of algorithms is part of the development of mathematical formalism that has been based on the probabilistic relationships between predetermined abstract sets marking the transition to the 20th century rationalism, the abstract vision of Modernism, the excessive trust and over-confidence in digital technology and visualisation. Data visualisation and scientific simulation have been largely used in science and across disciplines for visualising and investigating the co-ordinates of the real world. Despite early hopes however, new technology has not eliminated indeterminacy. The workings of Virtual Reality (VR) itself are inconsistent. Based on software engineering and media theory e.g. Friedrich Kittler's writings, although programmers struggle to remedy noise – the inherent side-effect of the chip, which may include diffusion, quantum mechanical characteristics, etc. – machine reduction and constraints, an inherent degree of randomness and the increasing incompatibility between the diverse computational levels haunt digital technology even more. [2] Simulation includes processes of analysis as well as of synthesis. The algorithmic infrastructure of digital visualisation systems is characterised by precarious interplays between abstraction and complexity. New ambiguous relationships between part and whole emerge due to such interplays. The world appears to be unconnected, diffused and uncertain, as it is visualised through the algorithmic veil of digital geometry that is not only abstract but also unstable and paradoxical. [3]

Instead of seeking to achieve the unattainable, that is, to map the changing reality with exactitude and certainty, the most relevant challenge would be to map the boundaries and uncertainties of our knowledge and its applications. The use of data visualisation, scientific simulation etc., can be contradictory. On the one hand, digital visualisation is used as a means for analysing, simulating and predicting reality, evoking thus, a sense of objectivity, certainty and control, as the probabilistic space of VR is forced to

look real; as possibility becomes a kind of reality. On the other hand, it is broadly acknowledged that emergence derives from complexity; from invisible, interacting and unsettling potentiality fields. Complicated beginnings emerge as there is no ground zero, while elliptical ends occur due to a constant asymmetry that causes new fields of creative possibilities to appear. Such a condition of emergence calls for new modes of presentation, interaction and aesthetics, in relation not only to the issue of boundary but also of understanding reality per se. Instead of ignoring or introducing unpredictability and uncertainty, their hidden existence in digital visualisation systems can be creatively revealed and explored in depth. In this way, new modes of innovative practice that do not comply with the established doctrines of representation, formalism, constructivism and their opposites, can be developed.

In contemporary art, architecture and the related disciplines, the changing relationships between data flows and data matrices inspire new types of spatial research and practice. As a designed environment, built space can be perceived as a fragment of an excessive superimposition of dynamically interacting algorithmic, geometrical, topological and structural grids. A creative exploration of the data that flows into, from and within the physical structures of the built environment, challenges our common assumptions about space and our experience of it.

Instead of perceiving it as neutral and stable, space is heterogeneous and uncontrollably evolving due to its multiple layers of virtuality and reality. As Lev Manovich states, the influence of Quantum Physics and Manuel Castell's concept of informationalism is particularly evident in the development of digital and media art, while the most interesting and challenging art is created through the interactions between the various layers of space. [4] In this way, it is possible to surpass the limitations of producing a neat and settled hyperspace that is characterised by the unity and continuity of spatial augmentation. One of the most challenging possibilities arising, is to creatively reveal various interstitial spaces of emergence that derives from complexity; from the invisible and unsettling potentiality fields between the transitional states of spatial transformation and exchange. Imperceptibles and intermediates would emerge, as we unravel what is observable. The latter can be perceived as the outcome of the various intersections of interacting fields and the ruptures that emerge from the changing and heterogeneous nature of the layers of space. An oscillation between atopias, utopias and dystopias may challenge the established borderlines between a plan, a map and a building, as well as their meaning.

The opportunity to reveal and challenge the relationships between diverse kinds of reality and perception, can be realised through exploring various types of interstitial space, by creating innovative and unsettling spatial interventions. Certain emerging types of digital site-specific art enable the creative investigation of the intersections between various types of reality and their exchanges. For instance, Pablo Valbuena uses mutually interacting digital input and output processes for enabling in-situ spatial projections, injections and incisions, so that para-sites are revealed through light-based drawing. [5]

Creating inter-passages between digital and actual spaces forms part of the author's practice. The emphasis is placed on how interstitial spaces, in terms of code and maths, can be revealed in a physical space, where perception levels can be crossed. New modes of site-specific drawing are developed for tracing and interacting with the half- and by-products of algorithmic flows that remain unbuilt, their meta-dimensionality and the emerging paradoxes, through different modes of innovative spatial intervention. Instead of creating a singularity e.g. translating a digital design into a building, or developing progressions and sequences as in animation, the aim is to create inter-passages between the unsettling heterogeneous and interacting layers of architectural space. Interstitial spaces can be creatively revealed through the use of material/immaterial mediums such as light and line as well as through the

processes of drawing and diagramming, for opening up the interfaces of thought, VR and built architecture. Innovative spatial interventions can be realised through a) site-specific drawing of and onto the actual site, b) interactive spatial diagramming as realised in a site-specific semi-immersive virtual environment. When entering interstitial spaces, viewers encounter neither a mere place, nor an absolute or utopian space, but a kind of inter-passage between real conditions, VR and thought, where an unprecedented kind of spatial experience emerges. Inter-spatiality enables a new philosophical understanding, experience and perception of space, inspiring new types of spatial research and practice in art, architecture and the related fields.

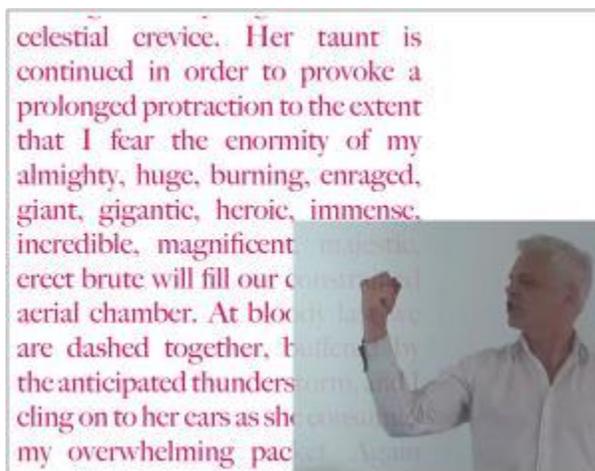
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FRANKENSTEIN2; OR, THE MONSTER OF MAIN STREAM

Annabel Frearson

Frankenstein2... is a new novel and associated works created using all and only the words from Mary Shelley's *Frankenstein; or, The Modern Prometheus* (1831).



Extract from Frankenstein2... as performed by Alex Walker.

Frankenstein2; or, The Monster of Main Stream is an ongoing project which involves rewriting Mary Shelley's 1831 novel, *Frankenstein; or, The Modern Prometheus*, using all and only the words from the original to create a new, contemporary story. During the course of its production, extracts of *Frankenstein2...* have materialised in a variety of contexts and media, examples of which I will be presenting at ISEA2011.

The following is a piece, produced for a recent group exhibition in London (UK) on pornography. It was displayed as a large scale photographic print and performed as a rehearsed reading by an actor with a Scottish accent.

Bear in mind that the following words all derive from Mary Shelley's *Frankenstein...*

"This is your captain speaking." I am on a flight to Rotterdam. Business class. Oh yes. Duty Free breakfast: bring it on! By the time we take off I am feeling fully accomplished. Here I am, eye to eye with a wondrous herd of congenial snatches as the cabin crew sallies down the isle for the safety routine. I willingly consent to being restrained in the bondage of my seat by one of these bright blue angels of the air. I admire her immaculate apparel and chemical proficiency, lingering over the sound of claspings metals as one side is glided in to the other with a satisfying 'chink'. Her name is Brandy – or could it be Caroline, or perhaps Dawn? – and she is Austrian apparently, not from Holland. Either way, her accent is diabolically alluring and full of the plaited rustic charm of hay meadows and snow-clad peaks as it flows into my ears like a trickling mountain-stream. How annoying when we are interrupted by Bernard's choicest cheese and cheerfulness. Quelling my embittered discontent with hard spirits I find the Southern Comfort comfortless but it nevertheless has the unexpected advantage of rendering me so absolutely, assuredly, audibly, barbarously, completely, deeply, dismally, dreadfully, eminently,

leaves the cloudless sky to penetrate its watery grave. And then I awake, still in the airport departure hall, with a pool of stiff cold seamen slowly descending southwards.

THE VJACKET: ENABLING THE VJ AS PERFORMER WITH RHYTHMIC WEARABLE INTERFACES

Tyler Freeman & Andreas Zingerle

The VJacket is a wearable controller for live video performance. It is worn by the performer or visual artist to control video effects and transitions, trigger clips or scrub frames with the output of the integrated sensor system. The sensors detect body movements like bending, touching or hitting, and can send OpenSoundControl or MIDI messages wirelessly to the various VJ programs, bringing the rhythmic movement of dance to computer interaction.



Sensor layout for the first prototype VJacket, 2010. It includes a LED on one wrist and light sensor on the other so you can cross wrists to trigger video effects. Image copyright A. Zingerle.

Introduction to VJing

A visuals jockey, or VJ, is the visual analog to the disk jockey, or DJ. As the DJ selects, combines and mixes music, the VJ uses tools to dynamically change the visual appearance of a space, often in alliance with the music and the crowd. Performers who are more affiliated with the art world than the electronic music scene may label themselves visualists or live cinema artists rather than VJs. VJing can be seen as an advancing wheel that provides a good platform for experimentation in material, forms, content or presentation formats and displays. [1] Although several festivals dedicate themselves to the VJing culture, clubs and nightlife remain its primary platform; in the club setting, VJs use video, film projections, lights and even smell to accompany a DJ's music set and to interact with their audience. [2]

Often the VJ uses short clips from disparate sources like archival films, photography, and computer generated animations that can be looped, remixed, combined, and arranged in countless ways for unlimited visual possibilities. Like the DJ, the VJ operates live and manipulates different media formats according to the content mapping, the visual expression or temporal and spatial montage. [3]

Several different software packages are available that can handle a wide variety of visual material. Often VJs use MIDI controllers to more easily trigger their clips, presets or effect layers. These generally-used

setups bond the VJ to the computer, restricting him mostly to a seated position behind one or more screens.

Enabling the VJ as Performer

VJing is a rhythmic manipulation of moving video and animation. A mouse and keyboard are not ideal rhythmic controllers because they are very rigid and unforgiving. It's common for a VJ to experience difficulty scrubbing a video rhythmically with a mouse because the mouse is too precise in position and too slow in response for gestures of rhythm, which are innately imprecise in position but very precise in tempo and response. Knobs, sliders and touchpads are more responsive than a mouse, but still require tiny movements for grand rhythmic gestures, and require precise position and attention (most knobs can only be turned by two fingers at once: a precise movement).

A more natural controller for such tempo-centric manipulation would mimic the movements of dancing, since dancing is the ultimate form of rhythmic expression. We see this concept in several new experimental VJ interfaces, including the maraca-like interface 'Rhythmism,' [4] and the 'WiiJ Video' interface, which uses the Nintendo Wii remote to control video through sweeping, rhythmic hand gestures.

We sought to extend the gestural concept, past just the hands to all parts of the body, to enable a VJ to control video simply by dancing. We embedded sensors into clothing to ensure minimal encumbrance from the interface. The VJacket allows for wide, imprecise movements with a precise rhythmic response. The VJ will not have to fumble for knobs and buttons or have to look at the screen to be sure he's clicking on the right thing – he will be freed to control the video using his body movements alone.

Because the VJacket is wireless, the VJ is free to interact with the audience and musicians on stage or even walking through the crowd – something which most hermit-like VJs do not usually experience, since they are often relegated to the back corner of the club behind the video inputs and lighting controls. With a wireless system, a VJ becomes not just an engineer behind the curtain, but an actual live performer – one whose movements are directly connected to the video projections. The audience will be able to see the VJ's gestures in connection with the video, and thus will become more interested in the performance itself.

Reeves et al. explain the importance of “expressive latitude” in a performance: the stylistic gestures a performer makes “that are not directly sensed by the instrument.” [5] Wearing the VJacket, the performer transforms these superfluous gestures into *direct manipulations* of the instrument – indeed reducing the expressive latitude, yet simultaneously merging that expression into the movements of the video performance. The bend of the arm, the slap on the stomach, and the wave of the hand are no longer purely showmanship but are given meaning in the visual context provided by the on-screen projections, synthesizing the performance of the body with the performance of the technology. “Such gestures are an essential element of deliberately performing interactions for others to see and appreciate, expressing skill and control and introducing an aesthetic component to the use of technology.” [2]

It is our ultimate goal to connect the VJ with the audience since doing so will create a more legitimate space for VJing within the performance community, and we hope to encourage more people to try VJing themselves. With video and consumer production becoming more ubiquitous, projectors becoming

cheaper and smaller – even integrated into our cell phones and cameras – soon every rock band, DJ and karaoke bar will have its own VJ. If they don't, someone with a pocket projector and mobile VJ setup will guerrilla VJ anyway. This is the future we envision, and we are trying to shape it with the VJacket.

Free the people

In recent years, several research projects have focused on the controllability of live performance, such as the multitouch surfaces 'reactTable' by Sergi Joda [6] and the 'Vplay' by Stuart Taylor [7]. However, other projects spotlight the performative quality of the devices by freeing the artist from his 'behind the screen' position and allowing unfettered physical movement on a stage or within the audience. Representative examples make use of neural interfaces like the 'Nervixx' by Tokuhisa, [8] or camera-based motion tracking like the 'Kinect + Visual Synth' project by VJ Fader.

We combined ideas from both percussion-based devices, such as the maraca-based 'Rhythmism,' [4] which transforms a simple percussion instrument into a VJ performance system, and more precise expressive instruments, such as the 'Djammer,' a handheld device that can be used for 'air-scratching' – giving the DJ the possibility to leave his turntables and move around in the nightclub [2] – to give the VJ a wide range of control possibilities: traditional scratching and fading combined with percussive elements for triggering effects or clips.

The Dutch performance artist Eboman created the 'SenSorSuit,' a suit that he uses for staged body performances, mixing live video and a network of sensors spread over his body. The SenSorSuit is full of bulky sensors and other equipment which must be taped onto the body. In contrast, we tried to make the VJacket as unobtrusive as possible, enabling the performer to just slip it on and switch it on with very little preparation time, making spontaneous performance more feasible and more comfortable. Unlike the SenSorSuit, which is a complete performance instrument, the VJacket is meant to be used in conjunction with other interfaces: it can provide basic functions that the VJ uses most often (e.g. global effects, clip loading, mixing and scratching) and keep them easily accessible, leaving the more complicated, lesser-used functions to other controllers, such as a piano keyboard, sequencer, or even the bane of live performance: the mouse/keyboard on the laptop.

Hardware Considerations

The VJacket uses a Bluetooth Arduino microcontroller board to wirelessly relay sensor data to the computer. The same way the printing press enabled the masses to experience art, the Arduino and other DIY open-source movements have enabled the masses to make their own cybernetic art and personalized technology – creating “products for a market of one person... You don't need personal fabrication in the home to buy what you can buy because you can buy it. You need it for what makes you unique, just like personalization,” as Neil Gershenfeld said in his 2006 TED Talk. We wanted to see where other people could take the VJacket idea, so we made the hardware and software open source and wrote tutorials on how to make your own VJacket – from building the circuits to mounting the sensors on clothing to using the software to control any aspect – and posted them to various DIY communities, as well as gave workshops to urban youths to empower them as creative entrepreneurs in their communities. [9]

To encourage this extreme personalization, we made VJacket hardware modular, with the capability to choose exactly which kinds of sensors you use. The original version had bend sensors in the elbows to control visuals by bending your arms, a linear (ribbon) potentiometer in the lapel to offer finer finger control, and photoresistors and piezo hit sensors for more percussive movements, but the circuits and software were designed as to allow any combination of sensors.

For example, in a later iteration of a VJacket designed for step dancer Geoffrey Frimpong, we used only percussive piezo sensors, so he could slap different parts of his jacket during the dance for a dominantly rhythmic, staccato audiovisual performance. Kevin Brito's dance style is more smooth and flowing, so he preferred the bend sensors and slide sensors during his performance. With such customizations, each sensor in a person's VJacket is an extension of that person's style: just as an expensive suit is tailored to follow the contours of an individual's body, the VJacket's sensors are placed to capture and accentuate the performer's natural style, creating a highly personalized instrument.

Slayden et al. found during user-testing with experienced DJs that "the interface had to be operated in a manner where one could develop good proprioceptive sense for and development of muscle memory, much like any musical instrument." [2] With the VJacket, the body becomes the instrument, bridging the proprioceptive gap and shortening the learning curve. We found during user testing that this learning curve is shortened even more when the user feedback is clear and expressive. Kids who tried on the VJacket picked up on the interface quickly; we noticed that when the sounds were off, the players had a harder time discerning which movements triggered a visual effect. With the instant and obvious feedback of sound combined with visuals, however, they quickly mastered the VJacket.

Software Considerations

Once you have the sensor data from the hardware, you need a way to control your performance software with it. There are many projects available that convert Arduino sensor information into messages that control various software programs, including Maxuino, Funnel, NETLab Toolkit, among others. However, they are mostly libraries that require programming experience, expensive development tools (e.g. Max 5 for Maxuino and Adobe Flash for NETLab Toolkit), and a good deal of development and testing time to use in a project. Consequently, many beginning users have a steep learning curve to overcome before they can start creating.

In order to make Arduino projects easier and faster to realize, we designed the Arduino2OSC software to accept and process multiple types of sensor input, using live sensor readouts to adjust the behavior on-the-fly. The basics are there: scaling input and output values, adding cutoff thresholds, as well as filters to smooth errant sensor data and envelope triggers to automate gestures. Once you have configured all the sensor inputs to produce the desired data, you can route the output as Open Sound Control or MIDI messages, two standards which are supported almost universally by VJ and audio software, such as "Arkaos Grand VJ, Max/MSP/Jitter, Reaktor, Abelton Live, Propellerheads Reason, Supercollider, Kyma, Processing, OpenFrameworks, etc. Using OSC, you can even send the messages over the LAN for networked performances." [9]

Another important aspect of the software is to be able to adjust the sensor values on the fly, while preparing for or even during a performance. Sensor data can change slightly from performance to performance (variables include the strength of the battery, bend sensors slowly becoming permanently bent, ambient light in a venue that affects light sensors), or the behavior could change (the act could

suddenly call for a “bleep” sound when there was a “bloop,” a cut when there was a fade, etc.), so the performer needs a way to adjust for unforeseen changes without opening up the development environment and changing code. We built the interface to be completely customizable while it’s running, and to have customizable presets that you can load for different performance sections.

Outlook

The VJacket was designed to be a completely mobile, wearable instrument that empowers performers and expands the performing space beyond traditional music venues, galleries and museums, thus merging the context for VJing from a performance space into an audience space. No longer is the VJ relegated to the back of the room or on stage; he can also be a participatory audience member projecting his own performance as a highly individualized interpretation of the music – an extension of dance enabled by fashion. For this reason, we are developing a new version of the Arduino2OSC software, called Sensorizer, which will be available on mobile platforms (Android) as well as standard desktop platforms. Sensorizer will connect the VJacket with a mobile phone or tablet wirelessly, and use the same OSC/MIDI bridge to turn the phone into a completely mobile performance instrument: either projecting visuals via a pocket projector, or creating sounds and sequencing music. Since Sensorizer is based on the well-defined OSC protocol, other mobile developers can write audiovisual performance apps to create new uses for the VJacket and contribute to a growing resource for “guerrilla VJs.”

Developers are already beginning to write games and performance software using OSC to control all aspects of the functionality. Games like ‘Miserable Pile of Secrets’ and ‘Savestate’ [10] make possible a new avenue of interface exploration by connecting unrelated systems, or codebending: “video games can play other video games, and become generative art. Oscillators can drive web browsers. Poetry can write music.” [10] Indeed, the VJacket can also be used as an input to these systems, enabling the wearer to write generative poetry by hitting the jacket to change the word choices, or play Tetris by bending his arms. We wait excitedly to see what other people will choose to control with their own VJackets, and hope that one day, personalized fashion technology and mobile performance computing will permeate our society in a community-driven collaboration on stage, in the streets, and at home.

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PARCIVAL GOES DIGITAL: NEW MEDIA AS PART OF A GESAMTKUNSTWERK

Gesa Friederichs-Buttner & Johanna Dangel

We describe the results of an evaluation concerning the spectator's reception of and experience with digital media within the interdisciplinary performance *Parcival XX–XI* of the dance Company urbanReflects and the University of Bremen. According to the qualitative interviews conducted, the audience experienced participation as 'disruption'. Four reasons can be registered: language, rhythm, limited exploration and shift of the spectator role.



Parcival XX–XI. © urbanReflects

Once upon a time...

there was an Arthurian hero called Parcival who was searching for something called the 'Holy Grail'. But what has this story of an old cup to do with us? The Company urbanReflects in cooperation with the University of Bremen associatively bases the new transdisciplinary dance performance *Parcival XX–XI* (2011) on the medieval legend of the search for a better world by showing quests for the redeeming Grail in the 20th century and by portraying their own version(s) of utopia.

Striving towards a new means of dramatic narration, *Parcival XX–XI* incorporates contemporary dance and digital media into a non-linear narrative with social implications. Not to bear up against but to converge with more traditional media such as dance, digital media shall be altered to an equal protagonist within the frame of theater. Designing digital media as an interactive experience allows not only the dancers to cooperate in the creation of *Parcival XX–XI* but also the audience. This paper describes results

of an evaluation concerning the spectator's reception of and experience with digital media. One major finding of the evaluation is that the audience experienced participation as 'disruption.' We have analysed the following four reasons for it: language, rhythm, limited exploration and shift of the spectator role.

Parcival XX-XI

WHAT IS IT ABOUT?

The narrative of Wolfram von Eschenbachs *Parcival* provides the frame for our interactive search for a better world. Analogous to the knight *Parcival*, we are on a quest for what is called utopia. Over time, humankind has discarded many ideas formerly held to promise a new world – the egalitarian ones of communism as well as the elitist ones of fascism. Interpreting capitalism as yet another 'wrong grail', the production tries to delineate current visions of utopia. It becomes a hatchery of ideas for a 21st century quest for a better world by questioning the concept of the Grail. The performance is built as a non-linear collage of atmospheric tableaux and structured into three acts: the first act 'celebrates' the breakdown of capitalism, the second act is a retrospective on totalitarian systems, and the third act envisions our very personal utopias.

WHY THE AUDIENCE SHALL PLAY ALONG?

Central to the production's interactive quest for a better future is the use of digital media. Talking about political systems and our personal visions of new human communities, audience participation is of principal interest in *Parcival XX-XI*. Parallel to our main subject, the individual in society, we thus design interactive experiences, in which the audience can witness the limits and rules of a system in a very basic way.

Digital media carries out a double role in *Parcival XX–XI*: On the one hand it is incorporated dramaturgically and aesthetically in form of interactive and / or live video sequences and on the other hand it is used as a 'tool' to allow interaction. In the latter case, Nintendo Wiimote controllers were used for various reasons. (cf. [1]) With the help of this tool, passive spectators are invited to merge into active performers to collaborate in designing the experience of the play for themselves and the other spectators. As technology-based interfaces always come with certain restrictions, also do the Nintendo Wiimote controllers. In this paper, however, the focus is not set on discussing these practical boundaries but rather on its major dramaturgical impact to *Parcival XX-XI*.

Designing Interaction

While designing *Parcival XX–XI* and its participatory moments, the two following questions were our constant tutor: First, how to design such opportunities in order to make the audience's action and its effect for *Parcival XX–XI* understandable for all 'players', and second, how to communicate the fact that the audience shall participate in the play and when. Talking about the first, a differentiation into three major tendencies of understanding can be summarized: understanding on a technical level, where one learns how to command via Nintendo Wiimote controllers, on a consequential level, where one understands the causal relations between command and consequential performance, and on a dramaturgical

level. Thus, designing participation appears to be a rather complex task which comes with various demands. (cf. [1]) As for making the use of the 'tool' understandable to the audience, we designed a pre-performance which is described in the next paragraph.

LEARNING TO SWIM

In reference to J. Murray who in [2] describes that "in a participatory medium, immersion implies learning to swim, to do the things that the new environment makes possible", this paragraph explains how the audience of *Parcival XX–XI* was taught a lesson.

With the help of the pre-performance, everyone was given the chance to learn how to handle the provided interface, in our case Nintendo Wiimote controllers. These events included a 'Wii fairy', a jingle, a dancer on a diagonal wall, projections, and the audience. Every five minutes, the audience would be requested by a jingle, saying "it's time for intervention!" Miming, the Wii fairy would now show the audience how to use the controllers and sort out difficulties. Ultimately, the audience was taught two ways to use their Nintendo Wiimote controllers during the performance of *Parcival XX–XI*.

The first gesture (mote being moved down) would introduce a new clothing item to the diagonal wall. The performer would then adjust her body accordingly. The second gesture (mote steadily in front of the body) would remove all items formerly applied. Repeatedly practiced in the pre-performance, these two gestures would reappear in the main performance, only with different implications. The two scenarios of *Parcival XX–XI*, in which the audience is asked for intervention, are described in the next paragraph. Further discussions about to what extent the audience reached not only the technical but also the consequential and dramaturgical level of understanding follow in chapter 'Qualitative Research'.

TO SWIM

The first scenario includes four audience members, each charged with dressing one dancer and (therefore) undressing another. The catch: Only three clothing items are available for the four dancers – always leaving one dancer naked. Participants can use their Nintendo Wiimote controllers to either steal an item or securing their own item, sometimes resulting in inactivity of one or the other participant. The second scenario includes three audience members charged with controlling an avatar. These avatars fight against the dancers. Participants can use their Nintendo Wiimote controllers to either let their avatar attack or defend themselves. Whilst no text is used during *Parcival XX–XI*, the audience interaction operates with words. It is introduced by the jingle "it's time for intervention!" and the starting point of the interaction is marked by the projection of "3, 2, 1, go!". During the participatory scenarios, the words "Steal/Keep/You are already dressed!" (1st scenario), and "Defend/Attack" (2nd scenario) come along with the projections to deepen the understanding of the interaction.

Substantial to the dramaturgical aim of the participatory scenarios is the aspect of interaction within a closed and prescribed system. As we deal with social systems in *Parcival XX–XI*, such as communism or fascism, we wanted to design an experience for the audience, which makes them feel as a social subject. Our scenarios are thus created as an analogy to society – both constitute a closed system in which citizens are allowed only a limited amount of freedom of action, since they are given only a limited amount of options for action: 'dress/undress' and 'attack/defend'.

Qualitative Research

30 short guided interviews have been conducted with ten females and 20 males between 24 and 63 years old. Most interviews were held in German and are here translated by the authors. Interviewees were chosen by chance. For statistic purposes, name, sex, age and occupation were also collected. Each interview took between five and 20 minutes and implied the same three short questions:

1. Which aspects especially caught your eye?
2. How did you perceive the use of digital media?
3. How would you rate the use of Nintendo Wiimote controllers?

TO SINK

Evaluating these first 30 interviews, one decisive term recurs again and again: disruption. Regardless of their professional background, many recipients describe that they experienced the two participatory scenarios not as part of the performance but as disruption in form of a "a break-entertainment" (interviewee 1: int 1). According to the audience, these two sequences do not seem serious, more like an "audition" (int 2), or like „physical education" (int 3) – "a gimmick." [3] One woman even stated that – contrary to what the jingle presupposes – she does not experience the interaction as a real intervention but as "being degraded to a robot" (int 4). It thus seems, according to Benford et al., that the "performance's continuity is at risk," [4] during the participatory moments for several reasons. As paper length is constrained, we cast only a short glance on the following four: language, rhythm, limited exploration and shift of the spectator–role. Contrary, there are a few interviews of which we assume that disrupting the flow of a performance can also be seen as a promising design strategy, as here: "It was different to the rest, with the jingle, text etc., and this is exactly why I remember those moments best" (int 5). However, in this paper we will not provide an in–depth discussion about it but indicate that this topic leaves space for future work.

LANGUAGE

"(...) out of the sudden there is text and the jingle. It is confusing. It appears to be more separated from the rest of the performance than it was planned, right?" (int 6)

Various interviewees remark that first, the jingle „it's time for intervention!" and second, the written text of "3, 2, 1, go!", "Steal/Keep/You are already dressed!" and "Defend/Attack!" has set the participatory scenarios aesthetically apart from the rest of the performance. According to the audience, by using language, an emphasis is produced which does not find its analogy on the content side. Using text elements in our piece without language was an attempt to make the interaction clear, quick, and easily understandable for the audience.

RHYTHM

"These participatory moments are interesting, too, but not as smoothly integrated into the rest of the performance as it could be." (int 7)

Many people judged the participatory scenarios negatively as not fitting into the rhythm of the performance. The interviewees thus communicate an important element of contemporary dance: timing. From a dramaturgical point of view, the first participatory scenario is scheduled to an appropriate point in time. Before talking about the totalitarian system in the second act of *Parcival XX–XI*, we offer the following experience to the audience: The political system we live in does not happen to us but is chosen by either confirmation or non-rebellion. But choreographically, the first participatory scenario is scheduled to an inappropriate moment in time as it follows after a quite long scene without music and projections, focusing on the materiality of the styrofoam cuboids. At this point, the audience expects something very dynamic and energetic to follow. Instead, the jingle as an introduction for the first participatory scenario intensifies the stagnation to a break. Further, members of the audience have to step on stage, take their Nintendo Wiimote controllers and get in position. This all takes a while in which we often 'lost the audience'. To overcome this problem, we are considering rearranging the participatory scenarios in order to find an appropriate timing for *Parcival XX–XI*.

LIMITED EXPLORATION

"I was disappointed about the fact that only two gestures would cause any action!" (int 8)

The two gestures are often described as too simple, not opening any kind of freedom of action. Interestingly, nobody reflected upon the fact that we wanted to produce exactly this feeling of restricted action in a set system to further encourage individual solutions. In none of the performances of *Parcival XX–XI*, a spectator sought for solutions beyond the prescribed system to overcome the constraints: For example, for the second scenario one could have denied to fight, as a test person did in the general rehearsal or as interviewee 9 says, "we all could have acted more impulsively by e.g. falling down to the floor, as the dancers did". But they didn't. As the participants follow our rules, there is no other solution than 'playing' against each other.

Interviewee 8 and many others seem to not come across the technical and consequential level of understanding: Even though participating in the play, they can not produce further meaning for the context of *Parcival XX–XI*. They appear to be frustrated and disappointed about the limited freedom of exploration offered by the controller itself. In order to release the audience from this rather sidetracking technical aspect of how to handle the controller, we are considering changing the technology from Nintendo Wii-controllers toward a more self-explanatory option (such as camera-based tracking solutions, motion capture suits or Microsoft Kinect). However, all suggested options come with various other challenges which are, in fact, of a rather practical nature. (cf. [1])

SHIFT OF THE SPECTATOR-ROLE

"It is very boring to watch people in their winter coats, doing the same action over and over again!" (int 10)

Although the declared aim of the authors of *Parcival XX–XI* was to not create a traditional audience situation of 'leaning back in the seats', the audience described the participatory scenarios as a disturbance to the (seemingly!) previously established traditional way of watching. According to the spectators, on the one hand, they were pulled out of their coziness by the possibility to go on stage and 'play' with the Nintendo Wiimote controllers, and on the other hand, they were supposed to watch other spectators

(non-professionals) to act on stage which resulted in different reaction such as e.g. schadenfreude [cf. 5] or boredom (int 10). Similarly, Benford et al. [4] suggest that "beginnings must be designed to introduce the narrative, brief participants (...). It should be designed to be an integrated part of the experience." For *Parcival XX–XI*, we might have failed in taking the chance of the pre-performance to not only brief the audience how to handle the controllers etc. but also to introduce the main subjects of the play. We only teach the mechanism of the interaction as such and do not communicate relevant hints to the audience by means of dramaturgical impact for the experience of the play itself.

Benford et al. [4] further define traversals between physical and virtual worlds and temporal transitions between episodes as moments in which the flow of the play is on risk. These points clearly bring us to the major issue of our participatory performance as we invite members of the audience to not only progress from spectator to active participant and finally performer, (cf. [1, 6]) but we also expect them to fall back into their seats and lean back again after "they have done what we expected them to do" (int 11). One can say, we prepared the audience for the shift from a passive spectator to an active performer in the pre-performance but we 'forgot' to design the back-shift from a performer to a spectator. [7]

By the use of participation, we cause different categories of audience at the same time: passive spectators and active performers. This results in the fact that there are various opportunities to miss parts of the performance as one is moving between the passive physical world and the active virtual world. As *Parcival XX–XI* does not provide a linear narrative but works with fragmented atmospheric tableaux which are then free for interpretation to the audience, one could think that the above mentioned aspects are of no consequences (and we partly thought so). But one major problem here is that most people expect to be served a story with a beginning and an end. And as they do not get 'the explanation', they feel baffled. All other challenges, such as 'participating', seems to be the icing on the cake.

To be continued

Summarizing, we can say, that part of the audience does not experience our interactive quest as 'real' but as 'fake' by calling it a disruption of the 'real play'. Reflecting on why they felt disrupted in the flow of the performance, they name reasons such as the use of text in a fully textless performance, the wrong timing, the limited freedom of exploration with the Nintendo Wiimote controllers, and the shift of the spectator role in an otherwise traditional piece. Still, there is a small group of people that felt encouraged to participate and got caught by exactly the disruption as it appears contrariwise to what one would expect of the 'common flow of a performance'. We might need to ask ourselves how to establish a rather smooth frame of expectation to find the right moments to break with it again. In this context, and what comes for us with surprise, our advertisement campaign seemingly promised the audience a 'proper' story and more 'real' interaction. We thus have to look into the need of helping the audience to trust themselves in their reception – to strengthen them in being an emancipated [8] and postdramatic spectator.

Acknowledgement

This work was funded by the Klaus Tschira Stiftung. We further like to acknowledge the support of the Ministry for Science, Research and the Art and Federal Cultural Foundation of Germany, Senate for Culture Bremen, the Landesverband Freier Theater Baden-Württemberg, Sparkasse Freiburg, Landesbank Baden-Württemberg LBBW, Cultural Office Freiburg, and FOND Darstellende Künste e.V.

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SIMILARITY IN MEDIA CONTENT: DIGITAL ART PERSPECTIVES

Christian Frisson, Stéphane Dupont, Xavier Siebert & Thierry Dutoit

This essay examines how media content navigation by similarity can foster new practices in digital arts, blurring the boundaries between composing/performing, curating/authoring, creating/interpreting. With MediaCycle, a framework for browsing media databases by similarity, we created several prototypes: a website for browsing dancers' identities through video recordings, a collaborative dancefloor for music creation.

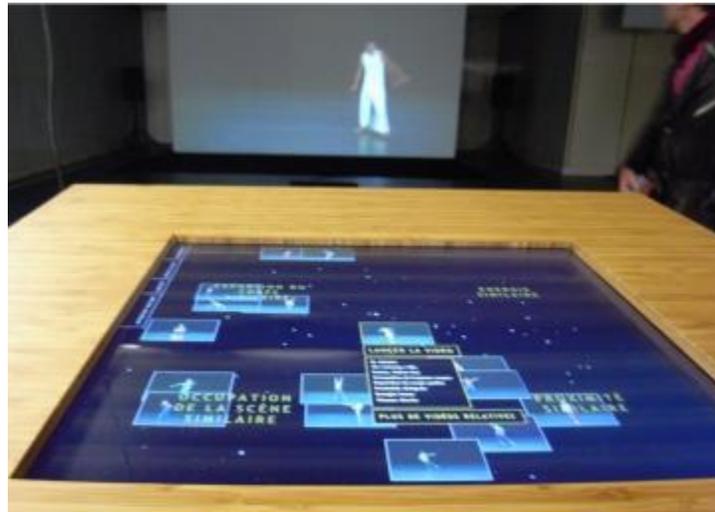


Fig 1. The DANCERS! Relational Browser seen on a multitouch booth.



Fig 2. LoopJam, a collaborative dancefloor for music creation

Introduction

Art and science cycle in loops: digital artists have been appropriating themselves technological advances in scientific fields such as telecommunication, signal processing and information visualization; while engineers and scientists are often inspired by concepts imagined by science fiction authors or fueled by artists trying to push the limits of these technologies when applied in their new media artworks. Beyond storage and transmission, one current limitation in technologies regarding media content is how to maintain an overall understanding of the information provided by each new media recording against the profusion and proliferation of newly-created and user-generated content. In his book *The Language of New Media*, [1] Lev Manovich stresses the importance of the "representation" of media objects in a database, how these are organized together as a mirror to the knowledge that these provide. When hypermedia links attempted to connect media objects one another into the world wide web through metadata and labels, the intervention of humans to annotate the massive data produced continuously is becoming more and more difficult. Recent progress in automated content-based analysis of media recordings opens new perspectives for structuring and navigating media databases, for instance by organizing the media objects by similarity.

Similarity in media content

THE CONCEPT OF SIMILARITY THROUGH (DIGITAL) ARTS

Besides the catchphrase "Similarities and differences..." used as a leitmotiv to begin the title of some essays dissecting specific art genres or styles, not much literature is centered around the concept of "similarity" in (digital) arts. Instead, an understanding of this concept can be grasped by focusing on specific uses of this term and peripheral vocabularies.

Literally, "similarity" names one of the Gestalt Laws in cognitive psychology: the human visual perception tends to discriminate outsider elements from groups in a visual collection. It has high implications in human-computer interaction and objector graphic design, such as how people can remember the content of a scene by gaining a structured knowledge of it, and how people can be attracted by objects or visuals that remind them of features of other objects they might have liked previously.

More specifically, humans have ever been fascinated by the complexity of natural phenomena showing repeating patterns: lightning bolts, clouds, tree-shaped vegetables, viscous flows. This concept of "self-similarity" has been inspiring fractal art, and is salient in paintings from Escher and compositions from Bach, as examined by Hofstadter. [2]

Each of both definitions, similarity as Gestalt law and self-similarity, underline one major aspect of similarity in media content: similarity can be used to characterize and compare several elements of a database (*inter-media*), and focus on the structure and contents of one single element (*intra-media*).

Several aspects of similarity can be used to describe the nature of artworks. First the relation of art to people: who originated it versus who keeps it alive in people's memories (the issues of authoring, composition, interpretation, performance, appropriation, inspiration, creativity, emulation, reproduction, recomposition, curation, restoration, preservation); second the relation of art works between them-

selves: what the work represents and how it place itself in a context of other works (identity, authenticity, singularity, resemblance). These concepts emerge in movie remakes (for instance re-performed or "sueded" movies in Michel Gondry's *Be Kind Rewind*), montages (Orson Welles' *F is for Fake*), collages (works of Jennifer and Kevin McCoy, Vicky Bennett aka People Like Us), cover bands and song covers (from re-interpretation to resampling with John Oswald's *Plunderphonics*).

How can organization by similarity of media content serve digital arts? Two tracks can be elicited from the aforementioned definitions and connotations: the first would consider the analysis, comparison, classification of existing art pieces; the second would focus on the generation of new art pieces based on content organization and navigation.

COMPUTATIONAL SIMILARITY

Computational similarity analysis consists in providing a machine interpretation of the salient characteristics of media objects, by applying feature extraction algorithms that downsize the data contained within the media into threads of specific information, and comparing the distribution of these features over a database using adapted distance metrics. Features can be content-based, that is extracted directly from the digital representation of the media object; or semantic-based, provided by manual annotation that labels specific elements of a scene. The book chapter from [3] provides a recent and detailed overview on the state-of-the-art of interactive representation of media databases, focusing on image browsing applications. It concludes mainly that most applications still miss a proper user-friendly interaction. Examples of higher-level content-based interpretation are identification of cover songs and style and genre detection for paintings.

Artistic works focusing on media similarity

Several end-user applications using content-based similarity have flourished recently, particularly recommender systems such as LastFM (<http://www.last.fm>), however artistic installations or works are more seldom.

Most notably, George Legrady's Pockets Full of Memories (2001-2007) [4] (see <http://www.georgelegrady.com>) make use of semantic-based similarity: both installation and formerly accessible online as a website, it uses the Kohonen self-organizing map algorithm to organize on a screen snapshots of everyday objects scanned by visitors in the installation, based on the textual description typed by visitors, thus proposing an emergent ordering since each individual induces her/his own perception of the object entered in the database that might differ from the visual similarities.

Martin Wattenberg's The Shape Of Song (2001) (see <http://www.bewitched.com/song.html>) proposes abstract visualizations in arc diagrams of the musical structure of hundreds of songs. Starting from MIDI transcripts of the musical pieces (sequences of notes defined by pitch, onset and duration), summaries are computed using the maximal matching pair algorithm and other rules to reduce the complexity of this algorithm. These summaries are visualized using overlaid semi-circular arcs whose thickness corresponds to the duration of the repeated musical passages, therefore incidentally underlining their relevance. Several non-interactive printouts of these arc diagrams have been exhibited at the Generator.x 2005 art event in Oslo, Norway.

THE MEDIACYCLE FRAMEWORK AND ITS ARTISTIC INSTALLATIONS

MediaCycle (<http://www.mediacycle.org>) is a software framework for organizing media content by similarity. Since 2008, it has been developed towards a modular architecture, supporting several media types (so far: audio, image, video, text), various media-specific algorithms for content-based low-level feature extraction, plugins for clustering (particularly the K-Means algorithm) and positioning media elements in a 2D space. Designed deliberately cross platform using open-source libraries, it was initially targeted for major computer operating systems (Apple OSX, Linux such as Ubuntu and Microsoft Windows), and more recently for mobile platforms (Apple iOS and Google Android). It provides exemplar single-media standalone applications for desktops and laptops, and server/client applications for mobile devices and servers in the cloud. OpenSoundControl (OSC) networked communication support has also been added (see [5]) so as to control the navigation in media content using off-the-shelf devices such as jog wheels and 3D cameras.

The DANCERS! Relational Navigator

Choreographer Bud Blumenthal's DANCERS! project traveled in Belgium and France in 2009 and scheduled shootings to audition dancers by recording them with top and front cameras while they were asked to improvise dance moves on music played back without choreography. The DANCERS! installation is composed of a multitouch booth where the public can select dancers videos to be displayed on a video projector at the original body scale, with surround sound. Dancers videos are selected using the DANCERS! Relational Browser that is also available online (<http://www.dancersproject.com/interactive/>) and is powered by the MediaCycle framework. Videos were automatically analyzed so as to provide a content-based 2D representation of dancers groups sorted by features such as: position (mean, standard, max), speed, ratio of the dancer bounding box and contraction index, space occupation and trajectory (small/large, compact/sparse, proscenium/rear as preferred zone). This installation provides an interactive and alternative way of browsing through dancers videos beyond retrieval through standard metadata such as artists names. This work has been described in more detail in Tardieu et. al. [6]

LoopJam, a collaborative dance floor for music creation

In 2011, we proposed LoopJam (see <http://www.numediart.org/demos/loopjam>), an interactive installation that features a sound map with audio loops organized by similarity of timbre using MediaCycle and a Microsoft Kinect depth-sensing camera so as to map the visitors' positions to cursors on the map hovering sounds with audio feedback, loops being synchronized in terms of tempo by the sound engine. A few people from the audience can thus carefully select sounds and collaboratively create an "improvised music composition". Organization by similarity proves itself to be useful since audio loops from similar instruments tend to be grouped together, hence small movements of visitors would provide a slight variation in terms of content in the sound rendering. This installation revisits the artist to audience relation and interaction since the DJ or curator of the installation responsible with choosing the sound library to be browsed within the installation can select her/his trademark sounds conveying a personalized musical identity.

Conclusions and perspectives

This paper provided a brief overview of artistic works making use of content- or semantic-based organization by similarity of media databases. Two main disciplines are seen as beneficial from requiring media content similarity: media preservation and documentation, and (realtime) media recomposition.

The described works use one single media type for the content-based analysis. Combining features from multiple media should enhance the robustness of the representation, for instance using both the video and soundtrack in the case of film documentation so as to analyze the relation between image and sound, in parallel to expert interpretation models, [7] using interactive summaries. Similarly, when classifying music albums, the visual artworks from the album, the textual description, and the lyrics might add be relevant as well to sort and organize a collection.

Regarding media recomposition, alternative and engaging interaction methods might be investigated to browse media collections in realtime (particularly for DJs and VJs), such as query by sketching to retrieve visual elements from a database while drawing, or query by whistling or beatboxing to create musical content. These practises will certainly take advantage from advances in scientific fields such as multimedia information retrieval.

Acknowledgments

The authors have been supported in a great extent by the numediart long-term research program centered on Digital Media Arts (<http://www.numediart.org>), funded by Région Wallonne, Belgium (grant 716631). The authors wish to thank other past, present and indirect contributors to the MediaCycle framework, particularly Damien Tardieu, Thierry Ravet and Julien Leroy.

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TECHNO VIKING - A CASE STUDY FROM THE WEB 2.0

Matthias Fritsch

For the last years Media Artist Matthias Fritsch was researching the Internet career of his widely known Internet Meme Techno Viking. In 2011 around 40 million clicks in various platforms and more than 3000 direct video responses can be counted. Technoviking is a entertaining and bizarre example of todays web-culture that represents the many form of user's approached to appropriate and recycle material at the web.



The Techno Viking Archive by Matthias Fritsch

THE CONTEXT

The Techno Viking project is an example for the reordering, reediting and remaking of an „original“ video in the internet. The original video is in analogy to genes called a meme. As such the original and its first clones, start to circulate within social networks, where the original mutates, competes with other originals and inherits. Becoming multiplied in this way, the original video becomes successful by reproducing itself, through various recycling techniques.

In this way the Techno Viking project questions the creation's origin of such an internet hype. The popular result is not the beginning, but the the original + n, after being altered and filtered several times through a chain of actions and reactions.

The potential of public attention such clips raise, brings also attention to the role of such major companies as Google. Google as the owner of YouTube provides the basic technological structure not only to enable and control, but also to profit from such creations. If the creation is based on “free” social information networks, the product is commercialized through a monopole company. In this way the Techno Viking is a perfect example to illustrate such new ways of production and distribution within user generated networks.

THE TECHNO VIKING

The Techno Viking is a tall, muscular, charismatic, intimidating German man in his 30ies, that danced in front of the camera at the Fuckparade in Berlin in 2000. The Fuckparade emerged as a reaction to the music restriction (e.g. the exclusion of other techno styles as Gabber, Speedcore, Hardcore Techno or Punk music) of the Berlin Love Parade and its increasing commercialization, as well as a public demonstration against the shut down of the famous techno club "Bunker," (which serves as a home for a private art collection today.)

The Techno Viking became famous firstly through the "Kneecam" video. A girl with heavy blue dyed hair is dancing to the rough techno beats, while a rather unruly looking guy, crashes unfriendly into her. That accident is causing the Techno Viking to demonstrate his physical power. He snatches the guy's arms and pushes him back from where he came dancing from. Pointing straight at another man and dominating him with his fiercely glance the Techno Viking produces an aura of fear, which brings the man to leave the situation. Only that incident enables the Techno Viking finally enough space to start dancing freely. His dance moves are wild and expressively but perfect in form. Soon he seems like the king of the street, having even fans, serving as “pop servants,” supplying him with water bottles.

At You Tube the fascination with the Techno Viking is expressed in several statements. One of the most famous lines started to reappear with the countless remakes of the “original” footage itself: “The Techno Viking doesn't dance to the music, but the music dances to the Techno Viking.”

After the most popular definition of Techno Viking [published by Mister Neutral on the Urban Dictionary](#) that 3041 people liked and 55 hated in November 2011 [1].

THE TECHNO VIKING ARCHIVE

The original 4 min video „Kneecam No.1“ was discovered in 2007 by the YouTube community and posted by users in various other platforms. After being linked and discussed in different web sides and internet forums, the footage got uploaded on www.break.com, a big american media portal. On this web side with a clear focus on a male audience – the video had it's peak on September 28th, 2007. Almost two million viewers were looking at it in only one day. Within the following 6 months more than 10 Million people were watching the video under it's new name "Techno Viking." In 2011 the clips overall attention counts around 40 million clicks in various platforms and more than 3000 video responses that directly connect to the original clip.

I was following those developments with great interest and researched the internet history of the video. In this way I documented its trajectory from its original production until it became a popular internet video multiplied by countless memes. The archive of the Techno Viking contains of emails, blog and

forum discussions, merchandising products and a selection of some hundreds of categorized image and video responses. To give an inside view on the career of the video and to show recycling strategies at Web 2.0 the archive is presented in form of installations and lectures. The archive contains around 8 GB of data and can be shared on request for further research and recycling ([contact](#)).

USER EXAMPLES

Following a selection of the most interesting and popular video responses:

Shortly after the main hype moderated clips were created to provide information about the new meme. A mixture of statistics, quotes and jokes make it easy to consume the semi documentations as the one from „Rocket Boom“ [Know Your Meme - Technoviking](#)[2].

Another moderated clip from the internet television channel „Revision3“ introduces a video response to the Techno Viking with subtitles as a new cult video itself: [Technoviking on Revision3](#) [3]. The clip refers to the [captured version of Techno Viking](#) [4] from YouTube user „rawcore“ that reached more than 5 million viewers on YouTube, [www.break.com](#) and other platforms.

But the most interesting genre of recycling memes is the re-enactment of the clip’s dramaturgy by being recreated in private and public space all over the world. A remix of more than 50 re-enactment Videos is published under the name “[We TechnoViking](#)” [5].

The peoples fascination with Techno Viking’s dancing skills create group choreographies as the [PSU Techno Viking](#) [6] or the one from the [AE Thesis Lab](#) [7] where a group of students is exercising the dancing technique.

The Techno Viking character even finds his way into the 3D worlds like [here](#) [8], where the Techno Viking like character „Mattias“ from the shooter „Mercenaries“ was animated to the exact dance moves of the meme or a [virtual re-enactment in “World of Warcraft”](#) [9].

The combination of one meme with another can raise the attention within the fan community and creates an overlapping mass to other internet hypes. Here it is throughout the use of Vernon Koekemoer and Chuck Norris in a „Streetfighter“ lookalike clip “[Technovikiung vs. Vernon Koecemoer](#)” [10] ...or the collages with „[Little Indian Boy](#)“[11] or [the main character of the cult movie „300”](#) [12].

The users by far biggest recycling strategy is the simple change of the soundtrack without doing much with the videolayers. There the Techno Viking clip was combined with all kinds of music genres like [metal](#) [13], [folk music](#) [14], [80ies classics](#) [15] etc.

AFTER TECHNO VIKING

From my experience with the TechnoViking phenomenon and by using the user's most popular recycling strategy I developed the Work „[Music from the Masses.](#)” [16] Following a five year schedule I started to publish silent movies in the internet along with an open call for composers, musicians, sound designers and everybody else to create soundtracks accompanying the silent clips. The submitted contributions are published in the web in combination with the video as music clips. The work is an open edition and

will not have a calculated end. It will be furthermore possible to always add new compositions and variations. This generic model of recycling and resembling is producing a situation that can be called "Youtube-Reality." It is a reality where the setting of an original identity is in constant and uncontrollable aesthetic modification.

For more information visit the artist's website

subrealic.net

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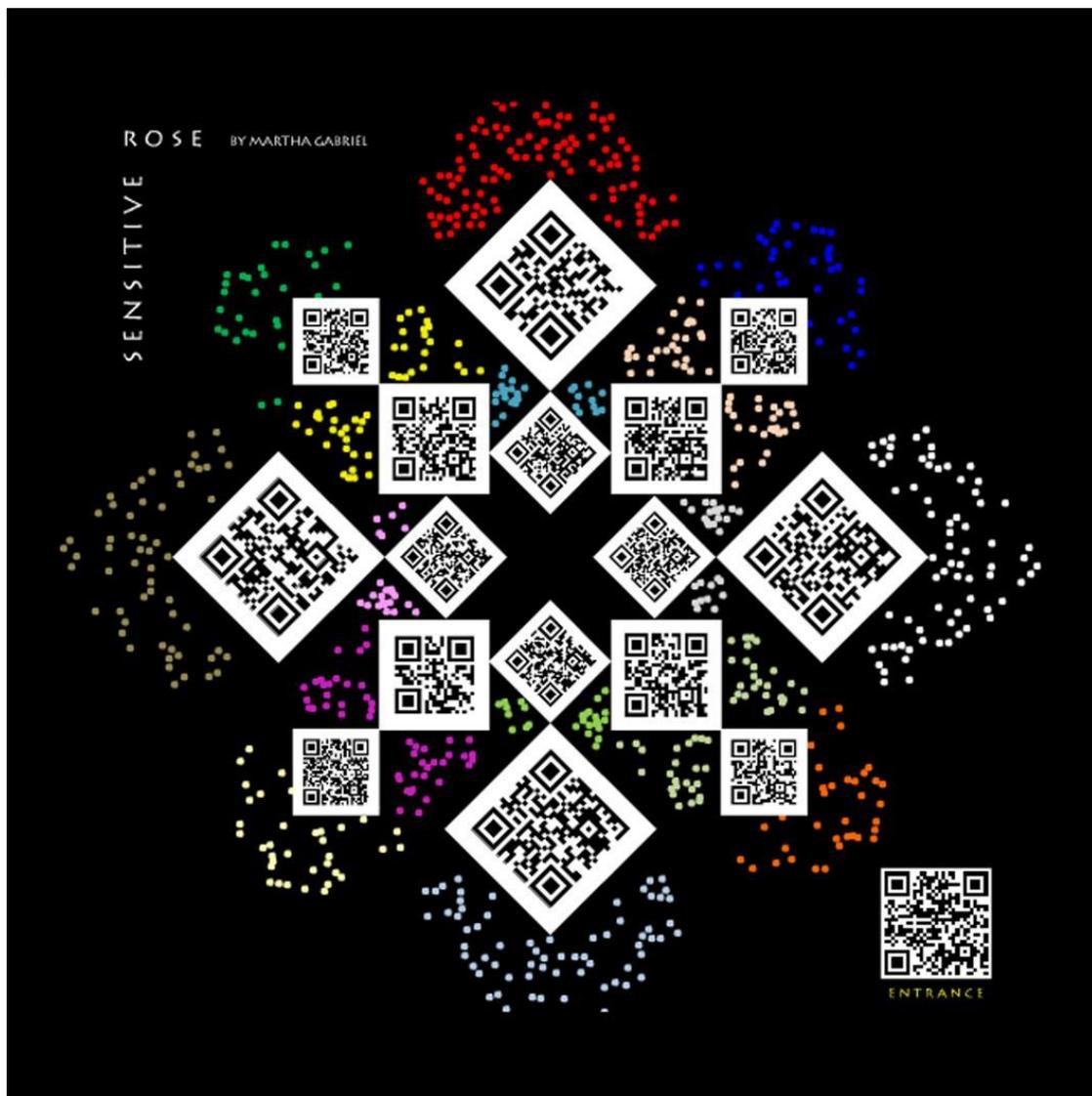
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1.

MOBILE TAGGING AS TOOLS FOR AUGMENTED REALITY

MARTHA GABRIEL

The objective of this paper is to describe the potentialities of Mobile Tagging (2D barcodes like QRcodes) as a tool for increasing and spreading the effects of Mixed Realities in Art. In this sense, we will start introducing the main concepts and some examples of Mixed Realities followed by the concepts and examples of Mobile Tagging, showing that they are connected and benefit each other.



SENSITIVE ROSE artwork screen shot (Copyright - Martha Gabriel)

INTRODUCTION

The objective of this paper is to describe the potentialities of Mobile Tagging as a tool for increasing and spreading the effects of Mixed Realities, including in the field of Arts. In this sense, we will start introducing the main concepts and some examples of Mixed Realities followed by the concepts and examples of Mobile Tagging, showing that they are connected and benefit each other.

Mixed Reality (or MR) refers to the fusion of the physical and virtual worlds to produce new environments and visualizations where physical and digital objects co-exist and interact in real time. On the other hand, mobile tagging is the process of reading a 2D barcode using a mobile device camera. Allowing the encryption of URLs in the barcodes, the mobile tagging can add a digital and/or online layer to any physical object, providing so several levels of mixed realities related to that object.

The uses of these levels of mixed realities have applications in several areas going from medicine and engineering to arts. This paper/presentation will use some artworks as examples to illustrate the functionality of the mobile tagging for creating mixed reality.

MIXED REALITY

According to the Virtuality Continuum concept (MILGRAM, 1994), the mixed reality is anywhere between the Virtual Environment and the Real Environment, comprising stages of reality, augmented reality, augmented virtuality and virtuality.

Examples of Virtual Reality are the immersive caves, where the interactor dives into the virtual environment. Some examples of mixed realities applications are:

- MINI Cabrio – car advertisement (Youtube, 2009-2).
- SPOILER - game (Youtube, 2009-1).
- BMW - engine maintenance (Youtube, 2009).
- Arcane Technologies - educational and military applications (Arcane, 2009).

Several kinds of devices and technologies can be used as tools for mixed realities, such as glasses, gloves, monitors, computers, cameras and mobile devices (PDAs and cell phones). Due the pervasive nature of the mobile devices, their potentiality for increasing the dissemination of mixed realities is enormous and can be leveraged by mobile tagging as described next.

MOBILE TAGGING

Mobile tags are 2D-barcodes that can be scanned by mobile devices in order to decode the information kept in the barcode.

There are many types of 2D-barcode (tag) and it is possible to encrypt many kinds of data into them. However, regarding mobile tagging, the most common encrypted information is URLs. The process of mobile tagging consists of scanning the tag with a mobile device camera using a mobile tag reader, which decodes the tag, opening the decrypted information on the device screen.

The most used patterns of 2D-barcodes for Mobile Tagging are QR Code (Quick Response Code) and Datamatrix. While conventional bar codes are capable of storing a maximum of approximately 20 digits, a QR Code, for example, is capable of handling up to thousand characters and all types of data, such as numeric and alphabetic characters, Kanji, Kana, Hiragana, symbols, binary, and control codes (Denso-Wave, 2009).

According to (Denso-Wave, 2009), the capacity of storage of a QR code is:

QR Code Maximum Data capacity

Numeric only - 7,089 characters

Alphanumeric - 4,296 characters

Binary (8 bits) - 2,953 bytes

Kanji, full-width Kana - 1,817 characters

Nowadays, although mobile tags are still a novelty for most of the countries, they are starting to spread as the 3G mobile technology get available around the world. The QR codes use is very common already in Japan and Datamatrix is more used in Europe, especially in UK. Most of the new models of mobile devices come already with the mobile tags (QR code and Datamatrix) reader. Older versions of devices can install a QR code reader, such as i-nigma (www.i-nigma.com), becoming so able to scan them.

A very interesting use of mobile tagging as mixed reality is the Semapedia.org (www.semapedia.org) that stimulates the use of in physical places that are present in the Wikipedia, mapping them. In this sense, each place is provided with a new layer of dynamic information coming from the digital online world, increasing so their use.

MOBILE TAGGING IN ART

There are several interesting examples of exploring mobile tags in Art. We will present three artworks using QR codes that range from traditional arts to electronic interactive arts. The first example is the work STILL by Frabrice de Nola (2011) that uses 2D and liner barcodes to build the image and links.

We can mention as one of the first interactive digital artwork the SENSITIVE ROSE (Gabriel, 2008) artwork, which builds an interactive compass rose formed by QRcodes that navigates into people's desires (figure 1). The work is a big projection (3 meters x 3 meters) and all the interactions happen through this projection by scanning the dynamic QRcodes for participating. The work was launched in November of 2008 and has received already more than 800 interactions (May.2009).

Figure 1 – Screenshot of the artwork Sensitive Rose (GABRIEL, 2008)

Another interesting artwork that uses QRcodes is the "Suite 4 Mobile Tags" (Beiguelman, 2009) which proposes an exercise of random and anonymous collective musical composition. By pointing a phone w/ QR-reader to a display, participants play a ringtone. The result is a sudden and temporary suite that plays with hi and low tech, the portability, the confusion between public and private, music and noise.

CONCLUSION

Since the mobile tags are simple tags that can be placed in virtually any physical object or person, added to the fact that the cell phones with camera have become a very inexpensive and pervasive device, the mobile tagging process can be said as one of the easiest and simplest way of creating mixed realities.

The use of mobile tagging can range from expanding the information on packages, bus stop routes, museum objects, to art.

Mobile Tags work like physical links to the web, allowing so that virtually anything can be part of an expanded mixed reality environment.

References and Notes:

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