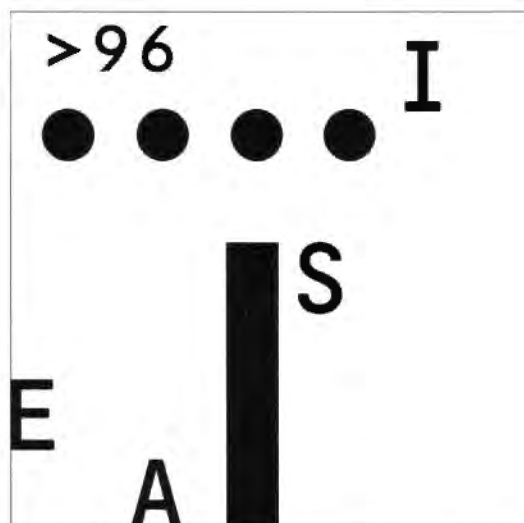
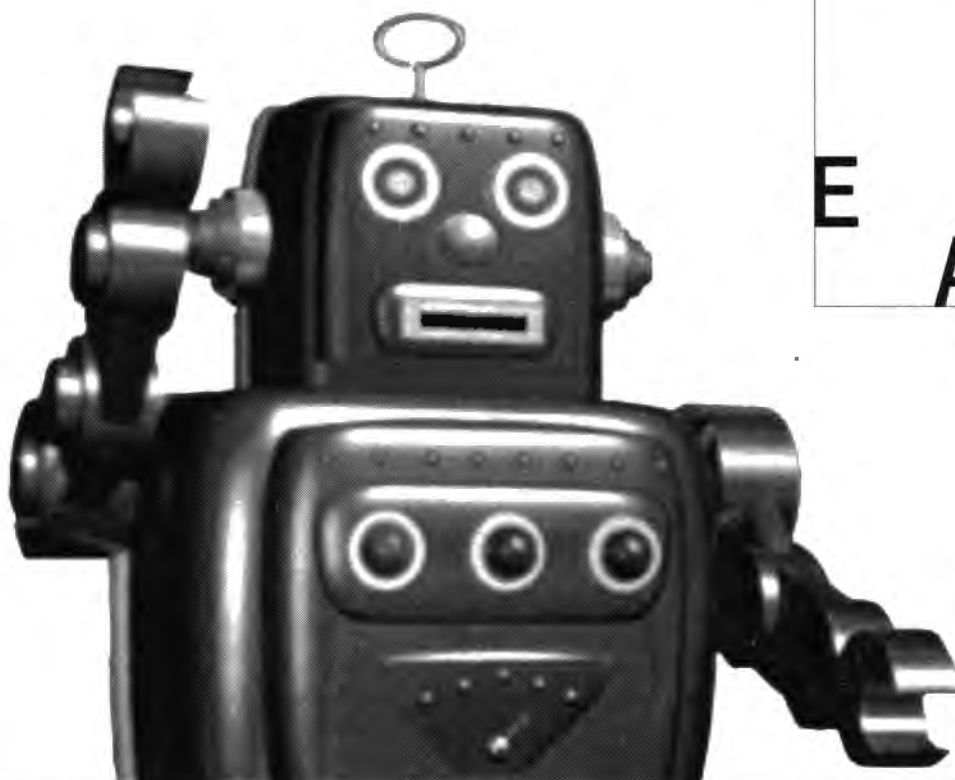


SEPTEMBER 16-20

ROTTERDAM
The Netherlands



BOOK OF ABSTRACTS

Including final program

ARTIST STATEMENTS >

ELECTRONIC THEATER >

PRESENTATIONS >

EXHIBITION >

CONCERTS >

WORKSHOPS >

96 festival
the new temptation

SEVENTH INTERNATIONAL SYMPOSIUM ON ELECTRONIC ART

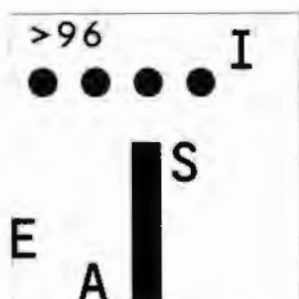
ISEA96

SEPTEMBER 16-20

The Netherlands

R O T T E R D A M

BOOK OF ABSTRACTS



Preface

by Wim van der Plas
Program Chair

Welcome to the Seventh International Symposium on Electronic Art.

This Book of Abstracts contains abstracts of the Papers, Panels, Posters and Institutional Presentations as well as artists' statements on the works in the Exhibition, the Electronic Theater and the Concerts & Performances. Besides that, there are introductions to the Workshops & Tutorials as well as the Round Tables.

Some of these items may need a little bit of explanation. 'Posters' are a regular part of many academic conferences. Close to the original meaning of the word, the ISEA Poster Sessions should ideally take place at the exhibition site, where artists talk about their work. However, ISEA96 only has a small exhibition at the Symposium site*). That is why the Posters are held in the conference rooms. They are distinguished by their content: in Posters particular works of art or art projects are the subject matter. Round Tables are discussions without a 'passive' audience. If you go to a Round Table session, you are expected to contribute to the discussion.

The ISEA96 Symposium program contains a large amount of presentations. Most of the program consists of parallel sessions. That is why you are advised to study this Book of Abstracts in order to choose your own 'route' through the program. Many presentations will be short, 20 minutes, only allowing for five minutes of discussion. Both the speakers and the session chair are instructed to stay within the allotted time. We hope it will all work out as planned and we wish you a good Symposium.

*)The larger exhibit is held at the Netherlands Institute of Photography, and is organized by V2 and R96, partly drawing on the exhibition proposals received by ISEA96.

ISEA PLENARY

I want to use this opportunity to draw your special attention to the closing session of the Symposium, the ISEA Plenary. Each year this session is organized by the Inter-Society for the Electronic Arts ('ISEA International'). It is meant to be an evaluation of the current Symposium as well as an announcement of the next two Symposia (1997: Chicago, 1998: Liverpool/Manchester). Also, proposals for later Symposia can be made public at the ISEA Plenary. This year, the ISEA Plenary will be special. After the very successful Symposium in Montreal, last year, the organizers have managed to obtain support from the government in Canada in order to maintain an ISEA office in Montreal. This means that after 6 years of very problematic functioning in the Netherlands, where no support was available for the Inter-Society, ISEA International starts a new life in Canada. The idea is to keep our Head Quarters in Canada for the next five years, after which we hope it will move to another location in the world, for another five

years, etc. So, this year's ISEA Plenary will be marked by a virtual handing over of the torch. At the Plenary, the plans on the future of the Inter-Society for the Electronic Arts will be presented. We wish Montreal the best of luck and we urge all participants to come to the Plenary.

A WORD ABOUT THE ISEA96 ORGANIZATION Originally the 7th ISEA Symposium was appointed to the Rotterdam Art School (part of the Rotterdam Regional College, HRO). However, shortly after ISEA95, they decided to withdraw. It was too late to ask another city to start organizing ISEA96 from scratch. This left the Inter-Society with only two alternatives: cancel ISEA96 or organize it without institutional backing and without means.

After support from Rotterdam City Development Corporation and Rotterdam Festivals was secured, we decided to continue ISEA96 in Rotterdam, with Wimfred Grashoff as the new Executive Director. However, much precious time was lost and fund raising had to be done by the new 'Foundation ISEA96'. Potential financial sponsors knew supporting this new foundation carried a risk, and that worked, to an extent, as a self fulfilling prophecy. We were not able to raise the planned budget and had to cancel several plans. This also explains why, for example, there is no free coffee, tea or lunch for the Symposium participants. We are very sorry about this. We have tried to find reasonable solutions for these and other kinds of problems (coupons for lunches, coffee, tea and beverages are for sale at the registration desk and you are encouraged to make use of these).

A growing team of volunteers and students has helped to organize ISEA96. Many of them very young and inexperienced, but learning quickly as they went along. I want to thank them all very much.

In any case, we hope you have a really good time this week.

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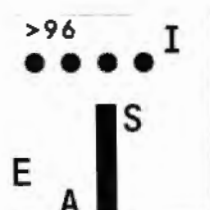


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ISEA96

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WEDNESDAY SEPTEMBER 18

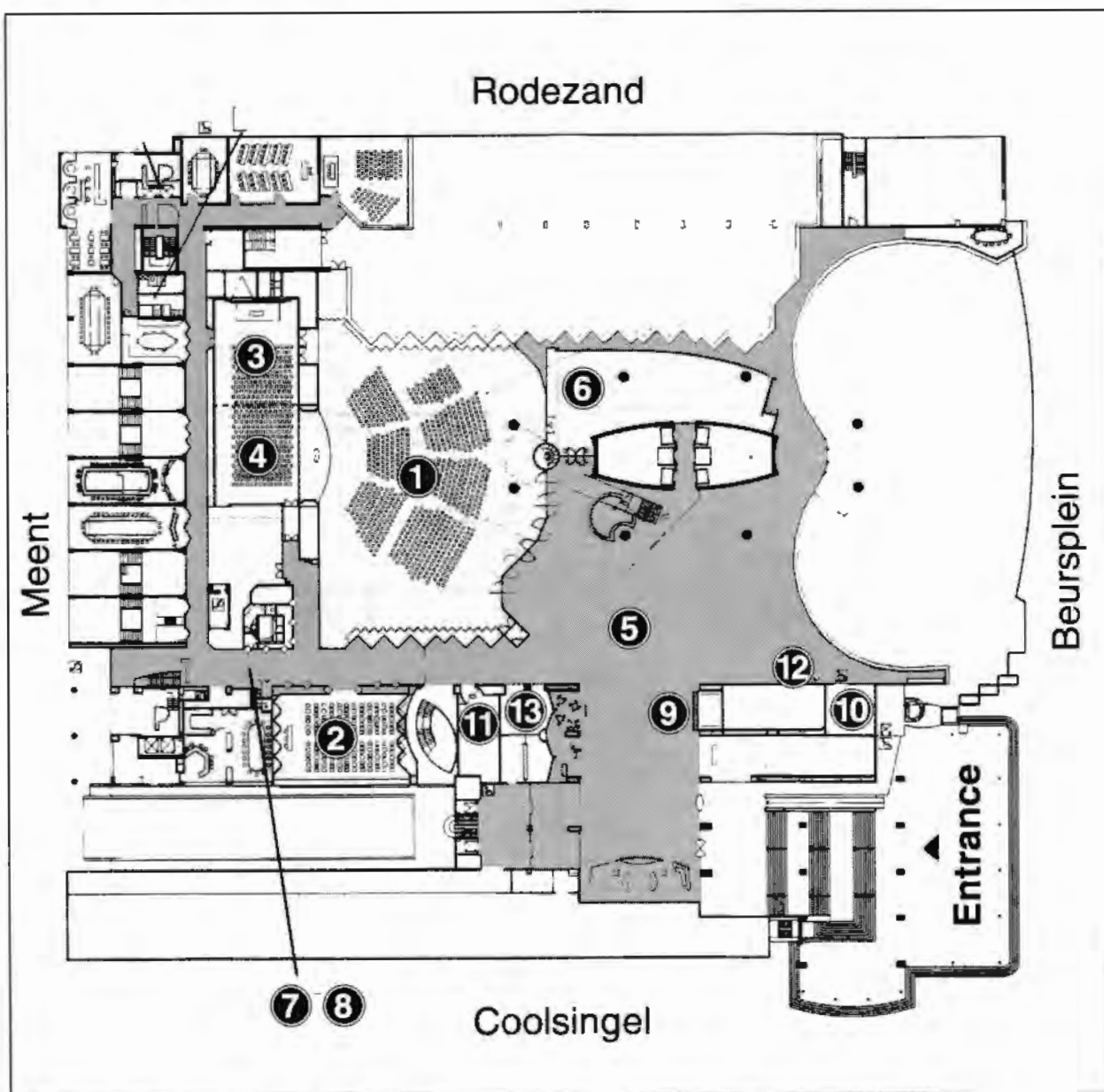
	Rhall ①	Da A ③	Da B ④	Ob A ②	werf studio ⑤
09.00	Welcome Jos de Mul: Networked Identities. (kn)				
10.00	Stelarc: On the Future of Networked Art. (lp)				
10.45	coffee break	coffee break	coffee break	coffee break	coffee break
11.10					
11.15		John Law: Drawing on the Brain, An Art - Science Collaboration. (sp)	Martin Raiser: Interactive Narratives; Educating the Authors. (po)	Hasnui Saidon: C.R.E.A.T.E.S.: Computer-related Experiments in Art & Technology - Studio University Malaysia Sarawak. (tp)	
11.50	Karen Guthrie & Nina Pope: Hypertext Journal - an Online Interactive Travelogue. (lp)	Mikhail Zalivadny: The Hatomaya (Iiro Electro Acoustic Music School Studio. (p)	Ignasi Ribas, Xavier Berenguer, Pere Freixas: The Handling of Poetry in Interactive Media: The case of a CD-Rom production on Catalan Poetry. (po)	Vladimir Muzheevy: Space of	
12.20	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
13.25					
13.30	Michael Whitney	Roy Ascott, Bill Seaman, Victoria Vesna: Artists teaching artists, case studies of the Masterclass Paradigm. (pa)	Eric Singer: Improv: Interactive Improvisational Animation and Music. (sp)	Jon Van Oort and Ed Slatny: The (S)TO: OTIS Project: The Past, Present and Future of Collective and Collaborative Art on the Internet. (lp)	Richard Povall: Aesthetic and Compositional Issues in Interactive Systems. (rt)
14.00			Leon Wennekes: TIME; for a better Communication and more Fun. (po)		
14.20					
14.30			Cristine Tamblyn: Mistaken Identities: A CD-ROM genealogy. (po)	Ryszard Kuczyński: The Context is the Message: Interactive Art as a Medium of Communication. (lp)	
15.00	coffee break	coffee break	coffee break	coffee break	coffee break
15.25					
15.30	Shawn Decker: Digital Creativity Inside Out. (lp)	James K-M: The Multimedia Learning Experience. (lp)	Patricia Search: Hickory Dickory Dock; the Clock strikes one in Hyperspace! (po)	Sean Cubitt: Online Sound and Virtual Architecture: Contribution To The Geography Of Cultural Translation. (lp)	
15.55		Mike Leggett, Christina van Aesche, Annick Bureau, Stephen Bode: Burning The Interface. (pa)	Lane Hall & LesMoline: What's So Hard about Hardcopy. (po)		
16.20	Carol Gigliotti: Bridge To, Bridge From: The Arts, Technology and Education. (sp)			Nik Williams & Henry Lowengard: CYBERGOMI; here today, gone tomorrow. (po)	
16.50	Tessa Elliott: Digital Art Programming and Fine Art Practice at the Centre for Electronic Arts, Middlesex University. (tp)		James Faure Walker: Cool Heaven Blues. (po)	Adrianne Wortzel: Medieval Cartography and Mapping the Ideological Territories of Cyberspace. (sp)	
17.00			Victoria Vesna: Bodies Incorporated. (po)		
17.20	Anna Unsyn: Teaching Computer Art with Integrative Assignments. (sp)	end of day	end of day	Berenguer. (lp)	
	end of day			end of day	
18.00	City Hall	City Hall	City Hall	City Hall	City Hall

	Rhall ①	Da A ③	Da B ④	Ob A ②	werf studio ⑧
09.00	Rich Gold: Technology as a Common Language between the Arts and the Sciences (ip). Barbara London & Grahame Weinbre: New Media and Self Expression. (ip)				
9.45	London (ip)	Leonello Tarabola. Computer Music CNUCE/CNR, Pisa. (ip)	Antonio Canturi. Multimodal Environments (ip)		
10.20	coffee break	coffee break	coffee break	coffee break	coffee break
10.40					
11.10	Collin Piepgras: Robotics & Art (sp)	Leo Chanjen Chen: Transparency as Interface: A 'Petite Histoire' of its Tools. (sp)	Peter Ride, Nina Pope, Karen Guthrie, Jane Prophet, Gordon Selly, Andi Freeman: Devising & Positioning interactivity in net projects. (pa)	Toshiya Ueno: Japanimation and Techno-Orientalism. (sp)	
11.45	Simone Simons & Peter Bosch: A Music Machine Balancing at the Edge of Order and Chaos. (po) Dammers (po)	Mike King: Concerning the Spiritual in Cyberspace: Immortality of Artist and Artefact in the Digital Terrain. (ip)		Nirajan Rajah: Locating the Image in an Age of Electronic Media (po) Manue Serra, Roc Pares and Narcis Pares: Babel: The Virtual Tower of Babel. (po)	
12.30	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
13.55	Rob Fisher, Masaki Fujihata, Christian LeVigne: Computers and Sculpture (pa)	Martin Sperka, Ray Lauzzana, Peter Bayls, Gerd Doeben-Henisch, Frieder Nake: Kunstliche Kunst - Art and Aesthetics in Times of the Artificial (pa)	Derek Richards: Permanent Revolution I: Flame Wars. (po) Tosa (po)	Robin Noorda: The Making of Horses in the Air: VR Techniques in a linear TV Program (po) James K-M: The Multimedia Learning Experience. (ip)	Josephine Haveman: Bridging the Gap (Education as a way of bridging the gap between artists and technologists). (rt)
15.00			Lily Diaz: Ancient Memory Systems: A Cross-cultural Comparison (sp)	Peter Lunenfeld: Dynamic Aesthetics for Dynamic Media; the Art Center College of Design, Pasadena, the Graduate Program in Communication & New Media	
15.30	coffee break	coffee break	coffee break	coffee break	coffee break
15.55	Kat O'Brien: Corrosive Edges, shifting channels in sexual and cultural landscapes (po)	Jorgen Gallesen: Into the Black Box. (sp)	Juleen Simon and David C. Wohlhart: DisNet - a model of Discursive Networking (ip)	Peter Lunenfeld: Light in space: Hyperaesthetics Case Studies (po)	
16.25	Julianne Pierce, Francesca da Rimini - Gashgiri, Sandy Stone, Sadie Plant: Erotics of the Internet. (pa)	Samia Halaby: Rhythms, the Aesthetic of Electronic Painting. (ip)	Jacquelyn Martino: Without a Special Object of Worship: an interactive book arts computer installation. (po)	Jose Alcala Mellado: Museo Internacional de Electrografia de Cuenca; The Museum for the Digital Art of the XXIst Century. (ip) Maria Stukoff, Chris Chesser, John Poff, Andrew Murphy: Space, Time, Body, World. (pa)	
16.50					
17.15		Paul Bonaventura: Laboratory Fusion School of Drawing & Fine Art. (ip) Koneris (ip)	Elsa Stensfield & Madelein Hooymans: Personal Observatory (po) Steve Partridge: School of Television & Imaging, Duncan of Jordanstone college of Art, University of Dundee. (ip)		
18.00	end of day	end of day	end of day	end of day	

FRIDAY SEPTEMBER 20

	Rhall ①	Da A ③	Da B ④	0b A ②	werf studio ⑧
09.00	Roberte Lord: Holiness and Dread: Poetics in Electronic Art (sp)				
9.50	Edward A. Shenker: Virtual Perspective and the Artistic Vision: a Genealogy of Technology, Perception and Power. (fp)	Rapaport (po) Rob Fisher: Journey into the Living Cell. (po)	Michael LeBlanc and Andrea Wollensak: The McLuhan Probes. (po) Zvonimir Bakotin: Trans Navigation (po)	Xavier Serna: Beyond Sampling Synthesis (sp). Brett Terry: Sound/action Paradigms in Multi Media. (sp)	
10.35	coffee break	coffee break	coffee break	coffee break	coffee break
10.45	Perry Hoberman, Victoria Vesna, Ken Feingold, Laura Trippi, Lorne Falk, Stelarc: Webbed Spaces: Between Exhibition and Network. (pa)	Josephine Starrs: Gameplay, Vapourware and Digital Abberation (po) Rose Freitag: Interacting with Human Characters (po)	Michael Bielicky: EXODUS - a virtual tele performance from the Negev Desert (po) Matthew Jones: Conventional Art as Web Based Exhibits: a new electronic art form. (po)	Janet Silk & Ian Pollock: Intimacy, Concept, Interaction: Artistic potential of Voice Mail and the Telephone. (po) Heidi Grundmann: Radio the Ne(x)t Century. (po)	
12.30	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
13.40	Elizabeth O'Grady: Building a House on Sand: Is the Digital World Sufficiently Solid to be a New Foundation for Artists. (fp)	Roc & Narcis Pares: Macbe & Liria. (po)	Von Stuermer (po)	Eduardo R. Miranda: Machine Learning and Musical Invention: A Case Study. (fp)	
14.10	Janice Cheddie Keith Piper, Roshini Kempadoo, Derek Richards: Beyond the Digital Diaspora. (pa)	Nell Tenhaaf, Eliot Handelman, Jeanne Rendolf, Phoebe Sengers: Interpretations: Art, science, cultural theory. (pa)	Machert (po) Weintraub (po) Tribe (po)	Pieter Huybers and Gerrit van de Ende: The Outlines of the Polyhedral World. (fp) Shawn Decker: Art and Technology Studies, School of the Art Institute of Chicago. (fp)	Rubin (rt)
15.00					
15.25					
15.30	coffee break	coffee break	coffee break	coffee break	coffee break
15.55	ISEA Plenary				
16.20					
16.50					
17.00					
17.20					
18.00	end of day				

World Trade Center



Presentations

- ① Rotterdam Hall
- ② van Oldenbarnevelt Room
- ③ Diamond Room 1
- ④ Diamond Room 2

Exhibitions

- ⑤ Main Lounge
- ⑥ Garden Lounge

ISEA Office

- ⑦ van Beuningen Studio (upstairs)

Press Room and Round Tables

- ⑧ van der Werf Studio (upstairs)

Lunch

- ⑤ Main Lounge

Various

- ⑨ Registration Desk
- ⑩ Toilet Ladies
- ⑪ Toilet Gentleman
- ⑫ Telephone
- ⑬ Wardrobe

Invited Speakers

Jos de Mul: Networked Identities

Human communication has expanded enormously in the past century. With the arrival of mass media such as film, illustrated magazines, radio and television, not only has the number of communication media forms significantly increased, but we can also see an enormous growth in the range of such media throughout the world. The past decades have produced the rampant growth of the latest shoot on this plant: computer-mediated networked communication. Media are no neutral way of communicating information, but they influence the way in which man thinks and feels, experiences himself, acts and treats others. Information technology, like previous forms of technology, serves to fashion not only objects outside ourselves but also human subjects. In his contribution De Mul will reflect on a crucial aspect of this relationship: the implications of computer-mediated communication for individual and collective identity. He will argue that the new electronic media put into practice post-modern deconstruction of the traditional, totalitarian concept of identity. At the interface of technology and imagination, one of the most important tasks of the electronic artist is to contribute to the construction and deconstruction of multiple identities.

Stelarc - On The Future Of The Net Phantom Bodies, Fractal Flesh And Collective Strategies

1. ALTERNATE POSSIBILITIES- Just as the Internet provides extensive and interactive ways of displaying, linking and retrieving information and images, it may now allow new ways of uploading, interfacing and accessing the body itself. Browsing the Net, generating Phantoms and constructing Virtual communities in Cyberspace is one contestable future. And instead of seeing the Net/Web as a means of fulfilling outmoded metaphysical desires of disembodiment, it offers on the contrary, powerful and unexpected individual and collective strategies for amplifying body functions and extruding body awareness. The Internet does not hasten the disappearance of the body and the dissolution of the self- rather it generates new collective couplings and a telematic scaling of subjectivity.

2. ZONE OF ERASURE- Consider a body remapped and reconfigured- not in genetic memory, but rather in electronic circuitry . A body needing to function not with the affirmation of its historical and cultural recall, but in a zone of erasure- a body no longer merely an individual but a body that needs to act beyond its human metabolism, circadian rhythms and the local space it occupies. A body that generates its awareness not through its mobility, but through its connectivity. Human awareness is altered by AI and AL and feedback loops filtering intense and extra-sensory experiences of teleoperated robots that navigate unimaginable micro realms and alien landscapes.

3. NEITHER MEMORY NOR DESIRE- Bodies must now perform in techno-terrains and data-fields where intention and action collapse into accelerated responses. Bodies acting without expectation, producing movements without memory. Can a body act without emotion? Imagine a body

that is directly wired into the Net- a body that stirs and is startled by the whispers and the promptings of other bodies in other places. A body that is informed by Internet interface agents- Web crawlers, software spiders, knowbots and phantoms. A body whose awareness is augmented by surrogate robots in situations and spaces where no body could go. These machines, with arrays of manipulators and hybrid locomotion would exponentially multiply the operational possibilities, scaling up the subtlety, speed and complexity of human action.

4. INTIMATE INTERFACES- As nano-tech and neuronal chips provide more internalized interfaces, connections to the Internet, software agents and surrogate robots become increasingly intimate and invisible. This would result in seamless connections and a symbiosis of spatially and electronically distributed systems- fashioning powerful performance and search engines. The body needs more adequate inputs and outputs for subtle and seamless connections. What becomes important is not the body's identity, but its connectivity- not its mobility and location, but its interface. Intimacy through interface, intimacy without proximity. The shedding of skin.

5. SPLIT PHYSIOLOGY (VOLTAGE-IN / VOLTAGE-OUT)- What of a body whose pathology is not having a split personality, but whose advantage is possessing a split physiology (from psycho-social to cyber-system). A body that can collaborate and perform tasks remotely initiated and locally completed- at the same time in the one physiology. Or a body whose left side is involuntary and whose right side intuitively improvises. Consider voltage-in to induce the automatic actions (from its Net- connected computer muscle-stimulation system) and voltage-out to respond to remote promptings and to actuate peripheral devices. The body becomes a site for more inputs and outputs. The body needs to be rewired to cope with its split physiology.

6. FRACTAL FLESH- AUTHENTICITY IN MULTIPLICITY- Imagine a body that can extrude awareness and action into other bodies distributed over the Internet- displacing intentions into someone elsewhere. Clusters of remote agents could collaborate in the performance of a single body in a particular place or a lone agent could initiate motions in a multiplicity of bodies in many places. These Net-connected bodies would experience collectivity in their own individual way. A possessed and possessing body- neither all-yours nor all-theirs. With neither an awareness all-here nor all-there. Bodies hosting remote agents, calculating with collective minds and speaking with many tongues. Consider a body then whose authenticity is grounded not essentially in its individuality but rather in the multiplicity of remote agents that it hosts and performs and prompts. Constructing a more complex and operational entity.

7. PING BODY / TELEMATIC DREAMING- Consider a body directly wired to the Web. A body that moves not because of the promptings of other bodies in other places, but that quivers and oscillates to the ebb and flow of the Internet activity. A body that manifests the statistical and collective data flow. A body whose musculature is actuated not merely by its internal nervous system but by the external stimulation of globally connected computer networks. Its

subjectivity would be telematically enhanced to perceive and perform beyond its biology and the human-scale within which it now functions. Its Virtual Web vision augmenting its optical flicker- switching, superimposing and splitting your perception.

8. OPERATIONAL INTERNET- INTELLIGENT SYSTEM-
Imagine the Internet structured so that it would continuously scan, select and switch- automatically interfacing clusters of on-line bodies (the size and expertise of the clusters selected for the operational or cerebral task to be attempted). Can a body function and cope with the multiplicity of agents- a fluid and flowing awareness that dims and intensifies as agents are connected and disconnected. Awareness and agency would be shifted and shared in an electronic space of distributed intelligence. The Internet becomes not merely a means of information transmission but a mode of transduction, affecting physical action between bodies. Electronic space becomes a realm of action rather than information. Are humans in the business of browsing and chatting to affirm their social, emotional and biological status quo? Or should we be plotting other trajectories with varying velocities in alternate spaces and structures? Perhaps being human is not about retaining our humanity....

LONG PAPERS

Multimodal Environments (MEs) are a family of systems capable of establishing creative, multimodal user interaction, and exhibiting dynamic, real-time, adaptive behaviour. In a typical scenario, one or more users are immersed in an environment allowing them to communicate by means of full-body movement, including dance and gesture, and possibly by singing, playing, etc. Users get feedback from the environment in real time, in terms of sound, music, visual media, and actuators in general (e.g., movements of semi-autonomous mobile systems). MEs are therefore a sort of extension of Augmented Reality environments, integrating intelligent features. From another viewpoint, a ME is a sort of prolongation of the human mind and senses. From an Artificial Intelligence perspective, MEs are populated by agents capable of changing their reactions and their "social interaction" rules over time. A gesture of a user can mean different things in different situations, and can produce changes in the agents populating the ME. MEs embed multi-level representations of different media and modalities, as well as representations of communication metaphors and of analogies to integrate modalities. MEs open new niches of applications, from art (including music, dance, theater), to culture (interactive museums), to entertainment (interactive discotheque, "dance karaoke"), to a number of industrial applications, many still to be discovered. In the paper, we present a flexible ME architecture, and its four particular applications we recently developed for art, music, entertainment, and culture applications: the SoundCage Interactive Music Machine, the HARP-Vscope, the HARP-DanceWeb, and the Theatrical Machine. The HARP/Vscope is a ME application for the tracking of full-body human movement by means of on-body, wireless sensors, for gesture recognition and real-time control of computer-generated music and animation. The SoundCage Interactive Music Machine (IMM) is a system based on a set of spatial sensors displaced in a sort of "cage", whose design has been focused to track overall, full-body human movement features without the need for any on-body device or constraint. The HARP/DanceWeb is based on a different human movement acquisition system (based on ultrasound sensors technology), which can be used both in stand-alone installations and integrated with the SoundCage IMM. The Theatrical and Museal Machine is a quite different application, consisting of one or more semi-autonomous mobile robots capable to perform tasks like Cicerone in a museum, or robot-actor on stage in theatre/dance/music events and art installations: such systems include audio output and a small computer on-board for basic, low-level processing (managing a sort of arco-reflex behaviors), and include radio links for (i) the remote supervision computer, (ii) the sound/music channel, and (iii) possible further radio links to control fixed devices displaced in the area. The systems described in this paper have been developed with the partial support of the Esprit Basic Research Action Project 8579 MIAMI (Multimodal Interaction for Advanced Multimedia Interfaces), have been utilized since 1995 in concerts and various events (theatre, museums), and have been selected by the Industry CEC Commission for presentation in live demonstrations at the EITC'95 (European Information Technology Conference and Exhibition, Brussels Congress Centre, 27-29

Sean Cubitt - Online Sound And Virtual Architecture (Contribution To The Geography Of Cultural Translation)

The aesthetic heart of the debates on internet communication concern the two architectural models, proposed in the terms highway and web. At its crudest, the debate comes down, in a global info-ecology, to delivery versus dialogue. For both, the issue arises of translation: in and out of English, of course, hegemonic tongue of the net; but also at a deeper level, of translation between cultures -- between artistic and technological, atheist and Islamic, whatever. I want to argue that this is possibly the single most fruitful challenge faced in interface and communications design, and that it is in artists laboratories that the real work is being done. The use of sound, repressed partner in most areas of audiovisual space, is a particularly fruitful place to start thinking about art at the interface. The idea of online soundscape is being split between A) communicative, instrumental use of voice to deliver data (telephony: talk, you listen; turn-taking) B) musicalised sound in a tradition stretching back through Stockhausen and Cage to Russolo, music as incidental background or organisation of time. So the divisions of the soundscape into instruction and mood-enhancer are part of its subordination to the textual-visual. What I want to do in this paper is to point towards some emergent practices among online musicians, among sound and radio artists, film recordists and aestheticians -- which may have lessons for us in how to explore the multidimensionality of sound. The reliance on the visual for interfacing is extremely limiting, especially in the form of the one-on-one, personalised and individuated screen: sound offers the possibilities for large-scale and SOCIAL interfaces, collaborative practices which occupy a space between what we currently have and the possibilities which constitute any possible future. Here the notions of architectures and geographies of sound are useful: how to inhabit, move through and share n-dimensional spaces created in sound. Reversing (deconstructing) the filmic relation between sound and image makes possible a genuinely new media formation.

Shawn Decker - Digital Creativity Inside Out

As the creative use of digital tools continues to become more important to artists, new pedagogies are needed to help expose students to the potentials of digital technology. Currently, much education is concerned with "virtual" versions of and extensions to previous technologically-based tools and usually focuses attention on these tools in relation to input to and output from the computer in the form of images, video, sound and other media. The author argues for an alternative pedagogy which instead concentrates on the nature of the internal digital representation of the physical world rather than on either the tools being used or the nature of the output the computer creates. This focus on the various ways the computer might internally represent reality, be it digitized images, sound, Cartesian space, or time, allows students to better understand the implications

of the computer in terms of the potential manipulations which might be performed on these internal representations, and to discover for themselves the close relationships between the digital versions of what are often considered completely separate mediums in the physical world. Likewise, digital representations of "thought processes," beginning with simple Boolean logic and moving to much more complex representations of human rationality and "thought," as well as simple indeterministic and stochastic representations of "nature" are areas which provide students with an entirely new insight into the potential of computers to simulate and to initiate actions. Most importantly though, this approach helps students develop their own "mental" picture of the processes going on within the computer, helping them to transcend any one software program or hardware device, and giving them an intrinsic understanding of how the computer may be used as a tool for manipulating things in the physical world.

Hans Dehlinger and Qi Donxu - Art Experiments and Mathematical Explorations into the Universe of Machine Generated Drawings

Machine generated drawings of very high density are explored as vehicles for experimental approaches of an artist. The universe of hand generated drawings is compared to the universe of machine generated drawings. It is argued that the richness of the universe of machine generated drawings reveals esthetic properties which rival those of the universe of hand drawings. A number of examples are used for illustration and a unique mathematical model is presented to describe and generate such drawings.

Rich Gold: Using Technology as a Common Language Between Artists and Scientists

PAIR, The PARC Artist In Residence Program, is an ongoing activity that brings artists and scientists together, one on one, using technology as a common language. Embedded within PARC (The Xerox Palo Alto Research Center, a unique institution in its own right comprised of over 200 scientists and researchers from molecular engineers, to computer scientists, to linguists, to anthropologists), PAIR is about creating "marriages" between professionals in otherwise separated disciplines. PAIR currently has nine artists installed at PARC in PAIRings that are diverse in the common technology and in the scientist/artist relationship. This talk will explore some of the fundamental ideas of PAIR, how they worked out in practice, some of the things we learned, and an overview of the work of the marriages.

Samia A. Halaby - Rhythms, the aesthetic of computer painting

During the early part of the twentieth century abstract painters created a form which departed from the illusionism developed during the Renaissance. With this new form abstract painters abandoned chiaroscuro and proclaimed self luminous color; they abandoned recognizable objects proclaiming a non-objective space - a space empty of

objects as seen from one point of view; they proclaimed relative scale and distance as they abandoned measurable space along with foreshortening and the diminishing size. They abandoned the use of perspective.

Cubist, Futurists, and Constructivist painters talked of a new, better, more complete illusionism as they made fun of Leonardo DaVinci's Mona Lisa. They sometimes mentioned motion and the fourth dimension when talking about their work. Twentieth century abstraction was further developed by the Abstract Expressionists and Minimalists in New York. Since the development of relative space in painting seems to have ended. Has the computer made the further realization of such relative space and motion possible? It presents the painter with the possibility of shapes in motion not as filmed motion but rather as shape in abstract motion. This abstract motion does not rely on optics nor on the geometric relationship of the viewing eye to a perpendicular picture plane. It is distinct from that motion created by a movie camera or camcorder. Furthermore, electronic media is more technology suitable to the form of self-luminous color than is pigments on canvas. The Monitor is a luminous surface with a magical memory and with color variations greater than the eye can differentiate. Can the computer with its potential for motion, self-luminous color, memory, and programming be used to push twentieth century abstraction into newer formal realms not possible in static painting? Can abstraction, thereby, become as useful a way of imaging the world as Renaissance illusion? Furthermore, is the computer a new medium in painting or is it merely a technology. What are the theoretical differences between a medium and a technology and what are the implications of such differences? And, has software which is tailored for the Designer hidden from the painter the potential of the computer?

Dr. Pieter Huybers and Gerrit van der Ende - THE OUTLINES OF THE POLYHEDRIC WORLD

Although we do not always realize this, the shape of most of the visible world around us is to a great extent governed by the geometry of polyhedra. A polyhedron is a shape that is covered by many (= poly) flat faces (= hedra). Even curved surfaces can often be considered as a three-dimensional tiling of infinitesimally small plane faces. If we use in this context the term 'polyhedron' we are generally referring to the so-called Platonic and Archimedean solids, which are convex bodies that are covered by a closed pattern of regular polygons. They have a form that is so perfect, that they exert a great attraction to both artists and technicians. Also in architecture they have been applied in many ways and they form the geometric basis of most buildings and structures. This paper deals specifically with the architectural use of these forms and with their influence on our man-made environment. They can either define the overall shape of the building structure or its internal configuration. In the first case, the building has a more or less dome-shaped, centrally symmetric appearance, consisting of a faceted or gridded envelope. Such polyhedral shapes are often combined so that they form close-packing conglomerates as for instance in apartment buildings, in folding structures or in space frames. Their original shapes are often not always directly recognizable and it is therefore

interesting to investigate common characteristics and to try to find out by what geometric laws these shapes are defined and how they can be influenced in order to make them fit more properly to the demands. A computer program is being developed, with the help of which the geometry of these structures can be analyzed. Three-dimensional information becomes available, either in alphanumeric or in graphical form, which leads to a better understanding and which is necessary for their visualization and realization.

Mike King - Concerning the Spiritual in Cyberspace

The start of the 20th century saw a profound influence on the arts from a strand of spirituality that had incubated at the end of the previous century. These strands included Theosophy (Blavatsky, Leadbeater, Besant), Anthroposophy (Steiner), and the work of Gurdjieff and Ouspensky. Kandinsky's *Concerning the Spiritual in Art*, Theosophy's impact on Mondrian, and the spiritual guidance of Itten at the Bauhaus are all evidence of a strong undercurrent throughout the 20th century, which also saw post second. As we look into the 21st century one is tempted to speculate that the spiritual movements of the early 20th century are now generally misunderstood, or even ridiculed, and that a new spirituality is emerging with its roots in science and not in the religious or the occult. The priests of the New Physics such as Frank Tipler and Paul Davies, however much derided by their reductionist colleagues, seem to promote a spirituality that is appropriate for the cyberspace artists of the 21st century. Tipler's paper looks at the teachings of Theosophy, Anthroposophy and Gurdjieff-Ouspensky and its influence on this century's art; it then examines the genesis of cyberspace in the new technologies and in the writings of science fiction writers such as Gibson and Sterling, and cultural theorists such as de Landa and the Krollers. The spirituality of the New Physics is discussed and the parallels with older forms of spirituality identified: in particular the idea of transcending the body, and the relationship. The key question surrounding the vision shared in *Neuromancer* and Tipler's *Physics of Immortality* is: are we just data? If so we can upload our personalities and become immortal. If consciousness is more than data then we cannot, and this question the brings us to the new Science of Consciousness. This infant science may be as doomed as phrenology was at the corresponding point a century ago, or it might provide us with the answers to our spiritual questions in cyberspace. Much seems to hinge on the code. While it is recognised that any discussion of the spiritual is fraught with difficulties, this paper attempts to open a debate that has been difficult to externalise in the arts for much of this century. The extraordinary challenge of cyberspace for the arts, with its questioning of the very bases of our identities and relationships, means however that it is a debate we cannot avoid.

Ryszard Kluszczyński - The Context is a Message. Interactive Art as a Medium of Communication

Interactive art can be recognized - in the framework of classic theories of communication with their three unit

model (sender - message - receiver) - as a medium that is unable to communicate. The more active a recipient becomes, the less possibility for communication an artist/sender can keep for himself/herself. On the other hand still treat the interactive media as medium of expression, and their works becan happen in spite of the medium's interactivity, or whether the interactivity creates a new way (and a new model) of communication. In the latter case we have to consider once more what are the functions of all elements involved in the process of an artistic (and non-artistic) interactive communication. We should also examine classic theories of communication to find out if any of them can be used to describe the model of interactive art communication. Among them the Roman Jakobson's model seems to be promising, with its chance to consider the context as a message in the communication process. The important account and analyze, is that the identity of a recipient's partner of communication is different than the one of interaction. The first role is played by the artist/sender, the latter - by the hypertext which is a base for the artefact. We must also analyze the way in which two models of communication: intrapersonal and mediated interpersonal create together interactive art communication.

Barbara London and Grahame Weinbren - New Media and Self Expression: The Changing Relationship Between Sender/Creator and Receiver/User

Composing 's one thing, performing 's another, listening 's a third. What can they have to do with one another?" (John Cage, *Experimental Music: Doctrine, Silence*, p. 15) In this paper we hope, among other things, to describe various works that are interactive. *avant la lettre*, or exhibit interactive qualities without actually being interactive. Time. Is it necessary? How does time get into, and how does it stay out of, art works that use recent technologies? Meaning. How do artists put meaning into art made under the influence of computers? How do viewers of this art get meaning out? Where is meaning located in these works? Does meaning mean anything? Or should we rather be thinking about power relations, desire, and textuality? Intention. In interactive works does what the artist intended count more, less, the same as it always did? Do we have to consult the artist to know how what to make of the work? This paper looks at some aspects of these questions, referring to the work by or about Slavoj Žižek, Richard Wollheim and Roy Schafer.

Roberta Lord - Holiness And Dread: Poetics in Electronic Art

This paper has two aims: 1) to present a brief representative history of electronic artists' direct use of poetic constructions, and 2) to investigate my premise that electronic media has engendered a new form of non-verbal poetry, that is, a means by which intellectual and emotional (appeal to spirit, memory, collective consciousness) sensibilities are poetically stimulated by the physical phenomenon of image transmission. This paper presents an intuitive (vs. empirical) argument that just as traditional poetry, presen-

ted in oral or written form, comes to the receiver in a bombardment of discrete units (words, vocal rhythms, pauses), so do the pixilated transmissions of electronic media. The impact of both is a steady impingement on the consciousness that stimulates the receiver's visceral awareness, that is we respond as though physically touched. The paper draws upon an eclectic range of examples, including the reach-out-and-touch-someone techniques pioneered by American evangelist Oral Roberts in his early television crusades, pop-physicist Robert Jastrow's theories about our species' "colonizing" of computers in order to provide more space for expansion of the human brain, and artist Michael Rees' belief that we are in the midst of a complex paradigm shift wherein computer-generated image is reasserting itself as as critical to the communication process as language, while, paradoxically, in order for that image to exist, it must first be described by language.

Eduardo E. Miranda - Machine Learning and Musical Invention: A Case Study

In this paper I will discuss the role of Inductive Machine Learning (IML) in systems intended to aid musical invention. I will focus on the modelling of a particular aspect of human intelligence which is believed to play an important role in musical creativity: the Generalisation of Perceptual Attributes (GPA). By GPA I mean the process by which a listener tries to find common sound attributes when confronted with a series of sounds. In this paper I will introduce the basics of GPA and IML in the context of a case study sound synthesis system of my own design: ARTIST. ARTIST is a system that works in co-operation with the composer, providing useful levels of automated reasoning to render the synthesis tasks less laborious (tasks such as calculating an appropriate stream of synthesis parameters for each single sound) and to enable the composer to explore alternatives when designing a certain sound. The system synthesises sounds according to user specification of values for sound attributes in a relatively high-level language, for instance: "normal vibrato, high openness and sharp attack". Each of these expressions is implemented in the lower-level terms of a specific sound synthesis algorithm; ARTIST currently works with formant a synthesis of human voice-like sounds. ARTIST stores information about "known" sounds as clusters of expressions. The composer may, however, be interested in producing a sound which is "unknown" to ARTIST. The system will attempt to compute the attribute values for this yet unknown sound by making analogies with other known sounds which have similar constituents. To do this, ARTIST infers which sound attributes should be considered to make the analogies; IML is therefore aimed here at the provision of this capability.

Jon Van Oast and Ed Statney - The SITO (OTIS) Project: The Past, Present, and Future of Collective and Collaborative Art on the Internet

More than three years ago, a small ftp site, that took the name "OTIS" (Operative Term is Stimulate) appeared on the Net. Its very loose mission was to collect art and "display" it via the Internet. It was also a way to meet other

artists who worked in both "digital" and "traditional" media. With the aid of the World Wide Web, and with the assistance of many wonderful people (and even a lawsuit!), the project now known as SITO is a thriving experiment in both "online art galleries" and networked digital collaboration. This talk will cover the history and current undertakings of SITO, as well as what we are doing to move ahead. Focus will be on the two main lobes of SITO: the "Archives", which are the static collection of thousands of images from hundreds of artists worldwide; and, "Synergy", which is SITO's exciting and dynamic collaborative half, where projects are always popping up and growing and mutating. Special attention will be given to EGADS, the flexible, time-saving new system being built to both administer and present the Archives; as well as Synergy:HyGrid, the latest collaborative undertaking, which recently won a distinction at Ars Electronica Prix.

Edward A. Shanken - Virtual Perspective and the Artistic Vision: A Genealogy of Perception, Technology, and Power

McLuhan noted that the dual aspects of Renaissance perspective as both spatial representation and as metaphorical point of view constitute a conceptual paradigm of sweeping significance. In other words, seeing and being are intrinsically interconnected. At the core of my thesis is the related idea that the perception of form can alter the form of perception, and vice-versa. In exploring this idea, I shall examine ways in which artists throughout history, and in particular, the contemporary artists Roy Ascott and Mirosław Rogala, have employed creative approaches to visualizing non-conventional perceptual possibilities. Panofsky's contribution to the theory of perspective is his proto-relativist notion that perspective is a symbolic form constituting and constitutive of a given culture, then by extension, I contend that form is intrinsically political, for the emergence of a given perceptual protocol, like perspective, does not occur without casualties. In this sense, perception is a battleground in which a struggle for power is continually waged. It is difficult to imagine perceiving the world without one-point perspective. But because seeing and being are vitally related, this dilemma raises not just the issue of what the world would look like, but what the world would be like. What would one's sense of self be like without the humanist ideals of individuality which developed alongside one-point perspective? What is the difference between being with perspective, and being without it? For the purposes of prospective theorizing, suffice it to say that those who possess certain techniques and technologies of seeing and representing possess a power to perceive and persuade in ways that those lacking those techniques cannot. In this sense, seeing, being, technology, and power are inextricably related. Artists have consistently worked to envision alternative modes of visual representation often at odds with the dominant conventions of the time. As one example, I compare the perspectival techniques of quadratura (which emerged in the 17th century) and quadri riportati (prevalent since the 16th century). My analysis suggests some ways in which the reception of changing perceptual forms altered the form of perception in the Baroque period. I also discuss some of the technical

advances of Jackson Pollock and Marcel Duchamp in terms of how these artists challenged Modernist art discourses and perceptual norms. New technologies demand new visual protocols, and contemporary artists like Ascott and Rogala have used advanced computer telecommunications, perspectival rendering, and computer-controlled, interactive environments to make important contributions to theorizing and developing new artist-object-viewer roles and relations. I interpret their work as artistic inventions/interventions, engaged in a politically charged process of reconfiguring the world. Through radical forms that alter and expand modes of perception and consciousness, viewer-participants in their art work are challenged to change not only the way perceive the world, but to change the way they exist in the world, and, moreover, to change the world itself.

Julian A. Simon and David C. Wohlhart: DisNet - a model of Discursive Networking

DisNet is a "multi user domain"; i.e. an environment for structured communication and collaborative working, learning and playing. It conforms with the basic idea of hyper-systems in that it allows for representing context as a linked, nonlinear knowledge structure integrating multiple data types. Additionally DisNet integrates the common capabilities of hyper-systems (i.e. representation, browsing, retrieval) with features supporting the generation and differentiation of contextual relations. "Discursive Networking" attempts to organize collaborative learning and working as an open discourse and to represent the development-process of a context as a networking of semantical units on the basis of their relations. The context which is continuously differentiated by collaborators in a group-project is accessible by them on different levels; these are represented as graphical domains of interaction, which are coupled structurally; the "Context Domain" organizes the context in a 2D- or 3D-space as a semantic network, allows user-centered navigation, aids the orientation in the contextual network and its structuring. In the "Content Domain" a sophisticated multi-field representation-tool supports the editing and browsing of contextual components. The environment is highly user-definable due to the modularity of the system; distributed maintenance of the contextual space as well as of the system is supported; beyond the authority over the content the student is given the responsibility for the organization and maintenance of the environment which intends to motivate a conscious and self-responsible participation. The pedagogical goals aim at improving argumentative preciseness, acquisition of analytical and integrative competencies and developing awareness of knowledge-relations. We understand that a main feature catalyzing learning is the feedback between mutually stimulating interactions, such as orientation, interpretation, reuse, differentiation, extension, etc. In the paper we will describe the approach, provide an overview of the main system features and elaborate our understanding of context generation with DisNet.

Michael Whitney - A Tribute to John Whitney

The John Whitney retrospective will present the work of the

late filmmaker in the context of his fifty years of developing core ideas concerning visual and auditory dynamics. In the 1930's, Whitney was deeply influenced by life in Paris where he immersed himself in the music of Beethoven and Schönberg and the Bauhaus. Whitney was involved from the start of his career in the process of making tools to achieve his vision. A member of the Academy of Motion Picture Arts and Sciences, Whitney was awarded its Medal of Commendation for Cinematic Pioneering in 1986. In 1964 he wrote of a time when the camera itself would be abandoned as an imaging making tool. He understood that mathematical principles of harmony apply to visual images moving in time just as mathematical principles underlie harmonic relationships in music. The retrospective evenings will illustrate the principles of "Digital Harmony" Whitney envisioned. A guided review of Whitney's work will illustrate his hypothesis, discipline and the method he devised in service of "Digital Harmony." Whitney's last computer compositions, a series he called "Moondrum," transcend pure technique. An interplay of an inner creative source with a mastered technique is evident in "Moondrum." This final work is largely unknown outside of Whitney's own composing studio. The "Moondrum" series will be played from Whitney's computer instrument during the retrospective.

MOONDRUM: PROGRAM NOTES Sixty years ago, in darkness and suffocating dust I drove to somewhere in the New Mexican or Arizona desert to observe U. S. Government proscribed Indian Ceremonial Dances. It was the impact of drums so loud they pound in the heart, as well as brief visions in random firelight - rattle snakes, rasal dogs, effortless, entranced dancing, all in patterns and momentary symmetries, it was the inhaled and quaffed hallucinogens of such a night. It is as if all this were exposed on a single photo-plate at the very core of my being. These impressions forever color my dreams and reflections. They're the content of my American essays -- a series called MOONDRUM. I have composed over a dozen pieces attempting to evoke the mood, the colors, sounds as well as an appreciation of the artifacts that were native to the peoples of the western world who flourished centuries before any modern nation existed. This is my best effort to find some reverent evocations of the feel and quality of objects of utility, decoration and religious mystery present in most of the possessions of our native predecessors. These compositions also explore newly emerging cross-cultural developments. They are the fruition of my fifty-year effort to dignify the role of technology in art. Only in the last decade of this century a new music, a new symbolism -- a new kind of abstract expressionist action painting with light and sound is becoming accessible to a solitary individual artist/composer in his own studio. With a special composing program on my computer, I create musical design intertwined with color design tone-for-tone played against action-for-action. Between the two -- tone or color - - I can't say which comes first. I don't copy "real" Native-American artifacts literally. Neither is there a real image of an engulfed cathedral or postcard of Iberia in the descriptive, impressionist musical works of Claude Debussy. The many examples of musical "image making" by composers a century ago have been an inspiration for these early essays in this new medium of audiovisual complementarity. For my part, I expect to continue to reconstruct, revise and

rediscover these twelve works that I have named MOON-
DRUM as if they were unfinished chapters of the single
volume of one's lifetime work. They must become my mag-
num opus the preoccupation of the remainder of a life. I
see much still to be done with them finally to round out this
life work. John Whitney, september 16, 1995.

SHORT PAPERS

Jürgen Callesen: Into the black box - relations between artistic expression and formal descriptions in computer based fiction and art

Black box: any unit that forms part of an electronic circuit and that has its function, but not its components specified (Webster's Encyclopaedic Unabridged Dictionary of the English language). Digital media confront the author and artist with a new material for artistic expression. In principle every single sample in the soundtrack or pixel in the image are generated or manipulated after certain rules and descriptions expressed in a programming language, which can happen automatically or through interactive response from the reader/viewer. This calls for a theoretical framework to describe the new means of expression that are unique to the computer medium, not only to create theoretical insight, but also to enable artists and authors to understand and use the potential and nature of the complex, undermining and chaotic conditions ruling in interactive and non-linear digital media. The point of departure is the thesis, that formal descriptions of the used representational material is an integrated part of the fiction or artwork if it includes interactive and non-linear effects. These descriptions can be very different in nature, spanning from mathematical descriptions of 3D shapes and figures to formal rules concerning the dialogue between two characters in a narrative. Books, films and paintings normally speak for themselves, whilst descriptions of their content and nature are made by their audiences, critics and academics. The artistic genius is often described as the person working mainly from intuition and talent combined with technical skills and analytical distance to the work. I stress the point that in interactive fiction or artwork an explicit description has a far more important role, since the description is defining the non-linear and interactive effects actualised on the computer. The construction of complex algorithms and data is a task in itself. Brenda Laurel has shown us, that in theory it is possible to create formal descriptions, that will generate an interactive first person experience of the diegetic universe in *Starship Enterprise*. My point is thus, that interactive art and fiction is only possible to judge when its actualised. In the process of visualising such a project a whole new range of problems will occur; what montage techniques will work, how are the actors instructed, how is the dialogue and storyline written etc., meaning that the description and the actual audio-visual manifestation are interdependent and unique for each work. The people writing or directing the formal descriptions must therefore also possess artistic talent in a traditional sense - in this case writing and directing a sci-fi series. I have two main reasons for focusing on specific genres and techniques already established within art and fiction. Firstly because our basic understanding of narratives and artwork in audio-visual media derives from a culturally embedded praxis, and secondly because computer mediated fiction and art hasn't yet reached a stage in both quality and content that is comparable to f. ex. video art, film, animation or comics. The outlined points will be illustrated by 4 Danish experimental works; a non-linear computer generated collage "the Cliche Generator", a non-linear videomontage generating drama-improvisation "the Improviser", an interactive impressionist fiction "Lailah" and a sketch for an interactive comic "Sim-Existence". This is followed by examples of how descriptions of cinematographic

techniques used in German expressionism, Eisenstein's films and the Hollywood film can be exploited as a point of departure for the development of new montage forms, that work in interactive and non-linear fiction. In the descriptions the theoretical framework is based on Metz, Barthes, Eco and Bordwell. The conclusion is that the artist or author as part of the creative process can enter the black box through a formal description involving both content and expression of the material they master. This is an necessary step in creating art and fiction that manifest an aesthetics and a poetic unique to interactive and non-linear works.

Leo Chanjen Chen - TRANSPARENCY AS INTERFACE: A "PETITE HISTOIRE" OF ITS TOOLS

This paper purports to examine the dynamics and implications of the notion of "language as interface" by tracing a genealogy of the concept of transparency as it is employed by various discourses. More specifically this paper foregrounds three usages of transparency and argues for a re-orientation of the "language mode" of meaning-making within our visual culture and digital discourses that might, consequently, help to account for the perpetual negotiation of interpretation between the visual and the textual. These usages include transparency in architecture, transparency in language and transparency in digital media. As Anthony Vidler suggests, modernity has been haunted by a myth of transparency: transparency of the self to nature, of all selves to society, universal transparency of building material, spatial penetration, and the ubiquitous flow of light and physical movement. Following this genealogy, this paper attempts to redirect our over-reliance on the perspectival-material based visual cognition to the metaphoric assumption of transparency in language. Transparency here is defined as the convention in which both author and beholder are absent from representation, objects rendered as if their externals are entirely perceptible in a unified field of vision with their internally fully accessible. By linking architectural transparency to the transparency of language, I will then discuss how the metaphoric usage of transparency in digital media is broken down by the actual program application. Namely, the data compression technology that renders and alters our concept of layering and interface. Finally, I propose to reconfigure a new epistemological paradigm in which to contain discourses of transparency in digital media and transparency of language. After all, echoing the spirit of Heideggerian and Freudian UNHEIMLICH, transparency reveals as much as it hides.

Lily Diaz - Ancient Memory Systems: A Cross-Cultural Comparison

Neither physical, nor situated at any specific location, memory is somehow intimately associated with our ability to learn and to, therefore, process and understand reality. A selective filter, memory has been a co-participant in our journey through the ages. As we advanced from the pre-history, our tools no longer limited to survival utensils, we fashioned technologies to supplement and extend both our internal brain and memory system.

The study of the technologies of ancient memory systems has recently become a topic of discussion among the theorists of electronic media. At the expense of ignoring other methods, the discussion and research has mostly focused on *Ars Memoria*, an ancient memory system derived from the art of rhetoric as it was practiced in ancient Greece. The idea of selecting and forming mental images of the things one desires to remember, and the subsequent storing of these in conceptual spaces, reflects the primacy that the ancient Greeks bestowed on the sense of sight. Yet our knowledge of a myriad different memory techniques that form part of the heritage of humanity is proof that sight is not the sole purveyor of meaningful memories. The concept of memory as a tool that can be learned and skillfully deployed to carve mental and ideological spaces, has indeed a long history. That this history is one that cuts across cultural borders is the scope of this essay. In it I will present and compare historical descriptions pertaining to two ancient, and radically different, models of human memory. The models that will be discussed are *Ars Memoria* and *Itoloca* and *Xiuh-E1matl*, the memory system of the *Nahua/Aztec* Indians of Mesoamerica. In the presentation I will focus not only on the engagement of the senses, but also on how the body is utilized throughout the process of information transfer. In addition, I will comment on the distinctions between mimetic and ritualistic communication exchange. As a conclusion, I will utilize Marshall McLuhan's theory of 'Ratio of the Senses' to do a cross-cultural comparison between the different memory systems presented.

David Mc Dowell - Scenography And Synesthesia: New Media and Aesthetic Experience

If you have suffered "Doom"-induced motion sickness or watched the awkward gyrations of players of a head-mounted display VR game you will need little convincing that new technology based media can have a pronounced kinaesthetic effect. There may be little aesthetic value in the knee-jerk, adrenalin-pumping stimulation delivered up by shoot-'em-up games. Yet kinaesthetics and aesthetics - the sense of bodily movement and the idea of artistic experience - have something in common, as the words themselves reveal. Both refer, from different directions, to the senses, to our faculties of perception, of the external world and our bodies' place and movement within it. 3D, first-person point-of-view games are just minor instances of how new technologies are directly addressing our senses, not just to achieve cognition of information but create experiences which are sensorially rich in themselves. The currency of the expression cyberspace clearly indicates that an experience of space is fundamental to expectations already surrounding new technologies. The experience of space has always been integral to all visual art forms - not simply on an illusionistic level, but on sensory, emotional and cognitive levels as well. New technologies lead to new artistic possibilities. To work effectively with new media, artists need appropriate principles to understand the nature of the space and the nature of the experience their work is to present to its audience. I will suggest two notions which may be useful when thinking about new art forms: firstly, scenography, as a way dealing with how aesthetic space is cre-

ated and organised through the use of new technologies; and, secondly, synesthesia, as a means of considering the aesthetic experience offered by synthetic qualities of new media.

Carol Gigliotti - Bridge To, Bridge From: The arts, Technology and Education.

The idea that education might serve as a bridge between technology and the arts is based on a metaphor, one connoting connection, and at the same time, separation. Following the physical logic of the metaphor, we locate technology on one side of the span, the arts on the other. Each have been perceived for centuries, in Western culture at least, as the antithesis of the other. The implied purpose of the bridge, a piece of technology itself, is to provide a ground upon which ideas from each of these areas of endeavor may travel to the other. A bridge's purpose is to connect. It may also serve, however, to solidify separation. Far from being a stable, fixed entity, education is a highly contested area where the perceived and actual stakes, the forming of the future, are high. Education's purposes and practices may encourage, discourage, or redirect the flow of ideas from one area to another. As individuals, communities, and the ideas they bring with them from either the arts or technology or their vast connected territories are filtered through the institutional bridges of education, they may be reshaped, thwarted or advanced. What is certain is that some form of mitigation takes place. This essay investigates the theory and practice, sometimes very much at odds, of contemporary educational involvements in the arts and technology. It is based, in part, on my ongoing involvement with and research on various communities' efforts to use education as just such a bridge. What has constituted success or failure in these endeavors, and on what characteristics have various participants based these judgments? How have issues such as gender, ethnicity and race fared in these activities? And most importantly, how have the recipients of these efforts, the students, characterized their involvement?

John Law and Chris Frith - Drawing on the Brain Project

"We wanted to explore the neural systems involved in planning & performing complex movements in space. We measured regional cerebral blood flow as an index of synaptic activity during the performance of three different tasks... In one condition subjects "drew" the shape of a figure in different locations, in the second they "drew" different figures in the same location while in the third control task they traced the figures on a screen. ...Our results suggest that two distinct anatomical systems subserve a network for the representation of spatial coordinates and a network for the representation of objects."

An simple interactive presentation of the experiment has been made in Hypercard with text, 24 bit images and simple animation. A more sophisticated version with better animations is 'under construction' in Director & will be ready

for September.

Quote from the Hypercard stack, Prof. Chris Frith:

"We have identified one area concerned with generating forms (left middle temporal lobe) and a different area concerned with generating position in space (bilateral parietal lobe). The areas we have identified are essentially the same as those previously shown to be associated with the perception of form and position in space when no movements are made and the volunteer simply looks at objects. This intimate association between perception and production has interesting implications for brain function in general and conceivably might have relevance for the teaching of drawing skills."

Colin Piepgras - Art and Robotics: the Back Door.

This talk will focus on the strategies and artistic performances of Colin Piepgras, whose work deals with the interface between the individual and a fast forward, mail-mythology culture. Piepgras, who is employed by the Field Robotics Center of Carnegie Mellon University, attempts to reconcile high-tech employment with a low-tech artistic production. Through the manufacture and performance of mechanical exo-skeletons and insulating super-suits in quasi-public settings such as airports and train stations.

Xavier Serra: Beyond Sampling Synthesis

The usage of sampling synthesis has become the most common technique for generating sound in computer music pieces and specially when computer generated sounds are incorporated into multimedia productions. Most artists do not conceive any other alternative. This presentation will focus on new developments in the area of digital sound synthesis that take sampling beyond the current limitations, offering new creative possibilities to artists. Sampling is based on reproducing and transforming, in the time domain, preexisting sounds. It has the virtue of maintaining the qualities of real sounds, but the number of possible transformations is limited and most of them are not musically intuitive. Another traditional approach to synthesis is to generate sounds from abstract mathematical equations, such as frequency modulation, which is a powerful and flexible way to synthesize new sounds. This last approach has lost ground in recent years in favor of sampling because of the difficulty in getting rich and realistic sounds. As another alternative, starting to be used by the computer music community, we propose a set of analysis/synthesis techniques based on spectral models. These techniques bring the possibility of obtaining perceptually based parametrizations of most sounds, which can then be transformed in flexible and intuitive ways before resynthesis is done. This approach maintains the richness and realistic qualities of sampling and brings the flexibility of FM. Spectral models can be thought of as a description of the sound characteristics that the listener perceives. There are several signal processing strategies developed in the last few years with which we can obtain these perceptual parameters and synthesize new sounds from the analysis data or its transformations. Fourier analysis would represent the

first step towards this perceptual modeling of sounds.

Sounds are decomposed in its frequency components, of which we can study their time evolution. A step further is to decompose sounds into sinusoids (partials) and noise (residual component), that is, analyzing sounds with this model and generating new ones from the analysis (Serra, 1995; Serra, 1994; Serra and Smith, 1990). The analysis detects the partials by looking at spectra and represents them as sinusoids. These partials are then subtracted from the original sound and the residual is represented as filtered noise. This results in a synthesis process that combines additive and subtractive synthesis techniques. With spectral models we can reproduce existing sounds and we can go beyond them by modifying their perceptual attributes. One class of interesting transformations creates new sounds by mixing or interpolating the perceptual attributes of two or more sounds, resulting into what could be called "sound morphs".

Eric Singer, Clilly Castiglla, Sabrina Liao, Athomas Goldberg, Ken Perlin - Improv: Interactive Improvisational Animation and Music

"Improv" is a system for creating interactive improvisational computer animation and music. The Improv system is an integrated visual and audio environment with characters that are intelligent, autonomous and directable. Characters in Improv are represented visually as "Virtual actors" or audibly as "virtual musicians." Virtual actors are autonomous, directable animated characters. Virtual actors are given personality traits by an animator or director and choose their actions according to these personality traits. They are influenced by and respond to the state and actions of other characters and objects in their environment. Virtual musicians are essentially "audio actors" and represent the players in a band. They choose and alter their playing style according to personality traits and environmental cues, analogous to the way virtual actors choose their movements. Improv is an interactive system. Actors and musicians respond in real-time to human input from a director using the mouse or keyboard; live musicians playing MIDI electronic musical instruments and controllers; and human participants through a variety of sensor devices. Improv characters also interact in real-time with the other Virtual characters in the environment. We describe the Improv system components, design philosophy and implementation, as well as demonstrations, scenarios and installations we have created with the system.

Brett Terry - Sound/Action Paradigms In Multi-Media

Most of the discussions concerning the rapid technological evolution of desktop and networked-based multimedia have focused on the domain of progress, a "progress" given by sets of numbers that are clearly greater in magnitude with every passing year. This numerophilia is understood palpably as a Being-towards-convergence, in particular, as the hope that multimedia over the Internet will, once we have conquered the problems of bandwidth and the right feature set, provide as flexible and useful a medium as desktop multimedia has been. Java, ShockWave, and a

host of nascent networking technologies exist as the current emissaries of this hope, though they have yet to advance any real works of quality multimedia. Underlying this hope, however, is a fundamental myopia that reinforces a human computer interaction model derived from a conceptually sophomoric transactional client/server model of distributed systems. Akin to the assumptions about technology as progress raised by our Heideggerian post-atomic consciousness, we have no corresponding epochal awakening that the fetishization of progress in informational technologies is overshadowing the exploration of creative alternative interfaces by its own relentless and demonstrable gains in bandwidth and speed. Sound models, in particular, have only evolved in small steps from a simplistic, isomorphic and stateless action/response model. Little thought, if any, has been given to a detailed consideration of alternative models of sound/action interaction for networked multimedia. In making an inquiry intended to systematic and comprehensive, one must speculate intelligently upon the perceptual and psychological ramifications of different sound models upon the user. Since these effects are not obvious, experiments could subsequently be derived in which it could be seen how users would react to more complex or intelligent uses of sound in the context of their actions. This paper articulates a detailed taxonomy that adds another level of complexity to the simple and ubiquitous action/response model. This level explores the possibility of an added level of indirection, an agent, between a set of sounds and actions. This idea is developed with examples by examining potentially useful data structures to associate with the action, a consideration of models that recognize sound as both static sound objects and as dynamic sound streams (with modifiable real-time parameters), and a consideration as to the different levels (microstructural/macrostructural) that can be affected by the agent. Relationships and interaction with bundled visible objects (sprites) are also considered. This schemata, comprising seven possible models, proceeds from defining the different models, to a discussions of how the models might be implemented in Director/Lingo, or on the web in HTML, Java, or ShockWave. Lastly, a perceptual model of reinforcement is examined in a speculation as to the perceptual ramifications of more complex sound/action relationships and their possible efficacy and uses.

Toshiya Ueno - Japanimation and techno-orientalism

My subject is "Japanimation", i.e animation made in Japan. Using film and video animation, I offer a critique of the situation of globalization as "Japanization", and the notion of "techno-orientalism". I focus on particularly on Mamoru Oshi's works. His most recent film, "Ghost in the Shell", was screened in many countries and he was interviewed by "Wired" and many other magazines. Three films, "Patlabor 1", "Patlabor 2" and "Ghost in the Shell" will be used as examples. I will discuss the relation between "Japanimation" (Japanese pop culture) and the Japanese ideology (philosophy, religion and the Emperor system).

Anna Ursyn: Teaching Computer Art with Integrative Assignments Integration of art and technology instruction

The important purpose of instruction in computer art graphics is to develop students' working habits on the computer in order to stimulate their artistic growth and production. The common concern related to computer graphics instruction should be probable the aesthetics of student computer graphics. We strive to train people to create products with the highest visual quality possible, acquire high visual and aesthetic skills and values, as well s technical and programming skills. The crucial point in supporting quality of student art is providing the students with stimulating assignments. This paper provides theoretical framework for integrative approach to instruction in computer graphics, art and science. The instructional approach in many computer graphics classes is based on the structured and oriented way of monitoring students' own projects at the end of the course. It happens very often that all students write own programs leading to the same visual solution. Students feel pretty well prepared for their professional careers, but find it difficult to create visually intriguing design. Standard rainbows and randomized colorful designs are the ones picked by the art juniors who search for technically innovative yet visually attractive artistic solutions.

Computer art graphics integration with teaching science

Fine art application of computers involves the use of symbols, which has been recognized by educators as a goal for educational systems. Integration of verbal and graphic information becomes easier due to the application of computer art to the field of science visualization (Cox, 1988; Owen, 1995). Advances in the Research on mental images in human cognition confirm the importance of mental imagery as a form of nonverbal processing (Cornoldi & McDaniel, 1991). Cross-disciplinary development programs allowed for student response to computer-generated feedback (Mones-Hattal, O'Connell, & Sokolove, 1990) and developed new curricula of computer graphics (Wilson, 1993; Brown, 1993, Owen, 1995). The use of technology improved reception of images in schools mainly through the CD-ROMs and other interactive optical storage technologies (Greh, 1993). Integrative approach to the art and science integration may lead to improving the students' understanding of science while creating computer graphics. Based on the tracking of the Research line associated with computer graphics instruction, one may often notice teacher's approach focusing on visualization ideas in graphical form, but it is hard to find a Research supporting the understanding of science through artistic expression.

Adrianne Wortzel - Picture This: Artists Mapping the Ideological Territories of Cyberspace with a Correspondence towards Examples of 13th Century Medieval Cartography.

Developing electronic technologies afford artists a new area of territorial mapping in the space of telecommunica-

tions. The territories of cyberspace, with their capabilities for collaboration, information transfer, communication, enterprise, journalism, education and Art, are forms of virtual reality, and, to some degree, virtual real estate. We already discern trade routes appearing, political factions emerging, creative arts blossoming, religious groups proliferating, educators conducting long-distance learning sessions, minstrels performing, and town criers disseminating information. These armatures of "scripts" and "maps" try to delineate what is, at this writing, a predominantly anarchical and chameleon-type space. In the 13th century, the medieval cartographer leaned towards an ideological mapping of the world became somewhat tempered by the rerearing of classical traditions and models. This conjunction occurred at a time when the science of cartography had been predominantly dominated for centuries by theology. This paper will examine the paradigm of navigation in new media; and the role imagination plays in the delineation and shaping of space; i.e., whether the medieval cartographer was shaping an "external (world)" or "interior (mind)" space. It will also touch upon the consequence of the choice and effect of words and image as "communicative language" in medieval cartography as well as in contemporary literature. Contemporary expressions on the mapping of language have been explored in literature and critical theory by James Joyce, Italo Calvino, Umberto Eco, Juan Luis Borges and others. The disembodied presence we have in cyberspace allows for appearances as "actors," i.e., the taking on of assumed characters and identities. It is common practice in virtual on-line communities for participants to adopt extremely idiosyncratic, sometimes phantasmogorical, characteristics, similar to those of the medieval cartographer. The tensions between various notions of "reality" in this space open up verdant territories for artists. Our world is now recreating itself via new technologies. At a time when sensor and satellite technology have the potential to report the location of any particular creature in the world at any time, in what form will there be a simultaneous scramble for bearings in a rapidly changing technology?

PANELS

ROY ASCOTT, BILL SEAMAN, VICTORIA VESNA AND STEPHEN WILSON - ARTISTS TEACHING ARTISTS: towards a new paradigm for art education

Art education is in crisis. It is not simply the impact of new technologies on art practice that has put the academy into a spin, but political, economic and commercial priorities have put the very idea of the creative arts at the bottom of the academic agenda. In place of art education we have multimedia training. In place of developmental curricula we have market modularity. Universities hire fewer and fewer artists and more and more administrators. Computers are academically ubiquitous but connectivity is universally constrained. Corporate accountancy has replaced personal accountability. Anaesthetics, the dumbing of the culture, has replaced aesthetics, even as aesthetics has moved from the veneration of surface appearance to the generation of complex systems.

What strategies might usefully be employed to return art education to artists? How can the skills and insights of one group of practitioners be shared, questioned or absorbed by another group? Can we talk about learning communities rather than academic classes? Is Web space the only place left to go? Do the new forms of artistic practice and collaborative creativity in cyberspace require new protocols and new criteria? Is education for 'Art in the Net' radically discontinuous from past pedagogies? If the site of art education is in the interspace between the real and the virtual what role does the intelligent agent play? We look at a number of strategies in which the panelists are variously involved: masterclasses in electronic art, doctoral research online, a cyberspace collegium, the local/global paradigm. Examples of work produced within these frameworks will be shown and discussed. We seek both to enliven the debate about art education on a broad front and to inform that debate with some useful specificity. Art education for, through and in cyberspace; digital dialogue; the intelligent interface; networked consciousness; in short, various approaches to teaching and learning, research and development, collaboration and co-production are amongst the issues which will be addressed.

JANICE CHEDDIE AND ROSHINI KEMPADOO -Beyond The Digital Diaspora: Flame Wars

The paper will use a visual illustration of my work on the net - which examines the intricate and complex system of hierarchy both in race and power - economic and the power of knowledge being developed within media/cyberspace. The work 'Sweetness and Light' produced for the project La Finca/The Homestead in April 1996 is the result. As the inevitable exploration of media/cyberspace, information networks and the use of new technologies takes hold I begin to look at analogies and comparisons. My thoughts and experience takes me to that of colonialism and the European expansionist past. While using the project as an example of some of the issues being raised and stated by black practitioners about and within cyberspace, I will expand these thoughts to look at ways in which the structu-

res being put in place still presents a space time and new location for black expression and reasons why. In other words the issue of 'leaky' technologies'.

Rob Fischer, Masaki Fujihata, Christian La Vigne - Computers and Sculpture

Purpose: To present and discuss current projects and issues produced by sculptors from North America, the Far East and Europe which demonstrate a variety of applications of the computer to sculpture.

TOPICS

1. Computer controlled sculpture: Kinetic, light and sound sculpture that responds to the viewer
2. Computer aided fabrication: Use of CAD and 3-D modelling programs to control cutting machines, laser and water jet tools, as well as the use of the computer in model making.
3. Sculpture and mathematical visualization: Computer visualization of complex mathematical formulae and genetic evolution applied to form.
4. Computer assisted presentation: Visualizing the site, lighting and animation. Computers as a design tool and for proposals.
5. Scientific computer imaging and its implications for sculpture: Futuristic tools and sculptural forms derived from the application of scientific software to sculpture.

Perry Hoberman, Victoria Vesna, Ken Feingold, Stelarc, Lorne Falk and Laura Kurgan - Webbed Spaces: Between Exhibition and Network.

For artists exploring networked environments and diaphanous architectural and acoustic domains, traditional ways of functioning within the established art world are being fundamentally altered. Artists, curators and art critics are well aware that the World Wide Web is a non-linear and chaotic space that doesn't fit neatly into the existing structures of existing institutions, such as galleries and museums. This shifts not only the relationship and the dynamic of the existing power structures, but is redefining the field of art itself. Long standing relationships between the artist and their audience, the curatorial process, and entrenched cultural institutions, neither apply to, nor nurture the development of contemporary art making as it increasingly occurs in this radically reconfigured terrain.

Depending on the particular interest of an artist, a variety of disciplines may become his/her resource while developing the work, thus creating a model that might be closer to scientific research than work which is solely based on practice. This is amplified by the fact that artists who work with computers have to master skills which are anything but intuitive. Artists who have successfully made the leap from the traditional exhibition spaces are creating a bridge between different worlds and defining an evolving field of artmaking located between networks and physical installations. Both artists and the institutions that they have traditionally affiliated themselves with are struggling to locate this new dynamic of creative activity. For this panel, we will be staying within the confines of the art world; from this vantage point we will attempt to define this newly emerging world. A wide range of topics will be addressed - from problems of hardware dependency and sponsorship to theoretical issues such as identity and the author/audience rela-

tionship. We will discuss the importance of visual and interface aesthetics as a determining factor of how media works are classified as art, and the question of who in fact is qualified to make such a judgement at this stage. By using "surfing the net" as a model, we plan to touch on a variety of subjects and issues that are having an effect on this emerging field. On the one hand, how does an audience influence work that is open to their contributions? And on the other hand, what strategies can the artist use to maintain the aesthetic and conceptual coherence of their work? The web allows participants to wander in and out of any space they visit. What ramifications does this have for the experience of artworks? If the artist or institution controls this access, do they negate the very nature of the web? What is the relationship of the audience and the artist? How does this relationship shift from networked space to physical public space? How can museums and art collectors deal with works that have no closure? Finally, what is the conceptual problematic of defining and separating the off and on-line spaces? The panelists will present examples and proposals of projects which are designed to blur these rigid separations.

Mike Legget, Christina van Assche, Annick Bureau, Stephen Bode - Burning the Interface

The exhibiting and distribution bodies have developed expertise over the last 20 years in the field of video art, over the last 10 with digital media installations. Current work on Cd-Rom is beginning to define the standards that will be expected of computer networks as bandwidth increases. High-end installations indicate other ways in which computer-mediated art will develop. The art organisations and institutions will remain inexorably linked with making this potential available to others to experience. They will also need to mediate between the artist and the consumer to make this possible politically. The session will focus on these political issues and the logistical problems associated with exhibition of artwork the issues anticipate.

The experience of developing and staging of the exhibition, 'Burning the Interface<International Artists CD-ROM>' has contributed greatly to our appreciation of the dynamics of the development of this new medium. Many other festivals, galleries and museums around the world over the last 12 months have likewise evaluated the many issues that work on Cd-Rom raises.

At ISEA95 a session attempted to deal with this area but it was less productive than it could have been by attempting to bridge across too broad a front with many speakers. The session must be focussed and specific and preferably involve prior circulation on the Web of papers.

BURNING THE INTERFACE<International Artists' CD-ROM> On-line info:
http://www.gu.edu.au/gart/Fineart_Online/info/cd-rom.html

Julianne Pierce - Erotics Of The Internet

A much celebrated phenomenon of the emergence of the

internet and digital media is the possibility for the interrogation of gender, subjectivity and identity. Contemporary art practitioners who investigate these themes have found electronic and online media to be a perfect vehicle for creative and intellectual application of these ideas. The panel 'Erotics of the Internet' will explore how the internet is used to redefine identity and subjectivity and how, in particular, women are using the internet as a source of inspiration and communication. The panel will look at how imagination and desire combine to create textual and visual worlds where identity fantasies can be acted out and gender interrogated and manipulated. The panel will also aim to investigate how online interactions effect 'real life' and how the disembodiment of the internet can feed back and influence the corporeality of everyday life.

The panel members cross a variety of disciplines including writing, electronic art practice and performance. Their work all shares the common goal of investigating the potential of digital media and in particular the use of online and interactive technologies as an artistic medium.

PETER RIDE, NINA POPE, KAREN GUTRIE, JANE PROPHET, GORDON SELLY AND ANDI FREEMAN - Devising & Positioning Interactivity in Net Projects

This panel will examine the strategic use of interactivity within net projects and ask whether to what extent there is an aesthetic based around interactivity. One of the consequences of the development of Internet projects, over and above that of other electronic media, has been the gradual defining of an aesthetic based around interactivity. This has operated both in the formation of the content of projects and in the way projects are developed for, and anticipate, their audiences. The development of recent applications and plugg-ins has increased the use of 'predetermined' interactive devices in web projects but without necessarily diversifying the strategies that have been clearly developing over the previous years. Arguably, interactivity has been most prevalent as a device that is employed to facilitate non linear narrative structures. It is also, and more profoundly, the key element of projects which are predicated upon the ongoing participation of the viewers to contribute new material, and as such, use interactivity over the medium to long term to challenge the status of the distinct artwork. Not only are these strategies based on the assumption that the artist can anticipate a desire on the part of the audience to participate in the art work itself, as a creative agent or active observer, but, furthermore, it often presupposes the existence of a generic audience and is not structured to encourage diversity. The panel will address projects in which the status of the art work as a discrete object is reduced by, and enabled by, the focus on the interactive process. The panel will consider ways that artists choose to minimise the status of the art object within their work by focussing instead on the process of interaction; at the same time deal with the tension that can be created between conceptual engagement and the apparent lack of visual substance. The panel will also address the role of collective interactive projects: how 'un-predetermined' interactivity can shape the outcome of a project; and how a website can be used as central point for other kinds of interactivity that are facilitated through the site; how a long term rela-

tionship between artists and audience/participants can be developed and sustained while allowing artists artistic control over the evolution of their work.

MARTIN SPERKA, FRIEDER NAKE, RAYMOND LAUZZANA, PETER BEYLS, GERD DOEBEN-HENISH - Künstliche Kunst ; Art and Aesthetics in Times of the Artificial

1. INTRODUCTION

At the ISEA 95 there were two panels dealing with the "high end" of automation in Art - Artificial Life and Artificial Creativity (renamed to the Cosmic Art). Both panels opened discussion but many unanswered questions and unquestioned answers remain. Some discussion continued on Internet, especially concerning the paper of D. Hofstadter. In his paper, he mentioned a computer music program that the audience could not recognize (without an explicit knowledge) whether the music was created by computer or human composer. We can consider this argument as a parallel to the test proposed by Alan Turing and known in Artificial Intelligence (AI). As in AI, where the question of intelligent behaviour remains open, similarly in art, there still exist discussions about aesthetic criteria. One of the attempts of formalizing this criteria was stated by Max Bense. His pupil, professor Frieder Nake proposed to modify the original title of this panel. The progress in computer science and technology and knowledge in human sciences, physiology, psychology, and cognitive sciences, as well as in art theory prompt us to design more advanced models: not only in representation of the virtual world of artifacts, but also in simulating human learning processes, motivations, imagination, associations, emotions... The diversity and deep specialisation of these disciplines has increased borders between them. Maybe that term "Artificial Art" will motivate more integrated view of human creativity.

2. Frieder Nake - POSITION STATEMENT

Artificial art (*Künstliche Kunst*) was the self-contradictory term coined in Stuttgart in 1965 in order to distinguish art with the computer from that without. The artificial has since then tremendously gained in strength, and reality sometimes gets replaced by virtuality. It may be worth the attempt to consider art and aesthetics under this aspect. 1. Information aesthetics was the heroic attempt in the sixties by Max Bense and Abraham A. Moles and their disciples to use the mathematical concept of information as the guiding principle for an analysis of aesthetic processes, both analytic and generative. Although, on a very general level, some exciting insight into the nature of aesthetic processes could be gained, the attempt failed miserably. Nothing really remained that would nowadays arouse any interest for other than historical reasons.

2. The failure of information aesthetics is due to its most fascinating starting point: the radical idea of an aesthetics of the object. All subjectivism was to be banned from aesthetics: Measure instead of value judgement, number instead of feeling, mathematics instead of psychology. An aesthetics of the object was supposed to produce methods of measuring the object such that a feature vector of quantitative and descriptive factors would replace the aesthetic object. It appears obvious, in retrospect, that this approach was bound to cripple once the notion of an information independent of the perceiver crippled. Not many are left

now who still believe in such a concept. An aesthetics of the object is hard pressed when asked for the difference between aesthetics and physics of the object.

3. Information aesthetics contained one assumption whose importance has increased and has become the central idea of a different approach to aesthetics. That assumption is the notion of the aesthetic object, or the work of art, as a sign. "Sign" here refers to the fundamental concept of semiotics, as, e.g., in Peircean semiotics. A semiotically grounded aesthetics not only opens to the discourse of postmodernism, it also links parts of aesthetics to informatics, which, in this view, turns out to be a technical semiotics. 4. Any formalistic approach to aesthetics is, of course, only capable of addressing the lower levels of aesthetics. In particular, if computers are to play a role in the game, whether analytically or generatively, only computable aspects of aesthetics can be addressed.

5. Treating any real process by computer pre-supposes three reductionistic steps: a semiotic transformation of things to signs, a syntactic transformation of signs to representaments, and an algorithmic transformation of representaments to computable structures. On the other hand, this very process of reductions opens up the field of aesthetic semioses for new algorithmic works, and thus for new aesthetic experience. The field of algorithmic semioses is still to be explored aesthetically, both on the analytical and generative levels. An aesthetics of algorithmic semioses is more likely to produce interesting results for sequences of objects than for individual objects. Its genuine realm is the small difference more than the grand gesture.

3. Raymond Lauzanna - THE ARTS OF THE ARTIFICIAL: Some Implications for a Finite Universe

This presentation discusses the relationship between creativity in the "virtual world" of computing and its relevance to creativity in the "real world" outside the computer. Particular emphasis will be directed towards the question of limits, both physical and intellectual, which are made evident by the use of computers. A reductive hypothesis is presented that reduces questions of novelty and innovation, to questions of selection and reproduction.

4. Peter Beyls - COLLABORATION VS. AUTONOMY: Models of Social Computing in the Arts

My presentation documents research aiming at the introduction of aspects of natural creativity in machines. It explores the concept of social computing where man and machine contribute to a climate of invention and discovery. It documents interactive works exhibiting a creative drive in either of two senses. First, in the sense of a conversational approach: how to make a self-expressive machine that also strives for the accommodation of a larger social whole -- in other words, how to solve the conflict of expression vs. integration. Second, in the sense of total autonomous behaviour: how to make a machine (soft or hard) that remains expressive in the face of ever changing environmental constraints. This requires that we also address the machine analysis and representation of 'character' and 'style'. The work presented bears strong relationships to current work in both artificial life and conventional knowledge-based AI. We shall offer examples of projects realised over the last 5 years including agent oriented simulations for real-time musical improvisation and interaction, genetic algorithms running cellular automata and emergent functionality in distributed, self-organising systems. 5. Gerd

Döben- Henisch - ARTIFICIAL CONSCIOUSNESS - Will Art replace the Artist?

When someone creates a computerprogram which shows in its behavior some similarity with humans, and the creator asks the auditorium, whether this shows that the program is like a human or, vice versa, that therefore a human person is not more than a kind of a computerprogram, we will get the known discussions without clear results. When humans start to make the most adequate descriptions from themselves including feelings, wishes, ways of thinking etc. and they construct a computer program based on this selfdescription, things are by far more difficult: in the ideal case such a program would show everything a human knows about (him/her)self. This is the case of an artificial consciousness. The creation of such an artificial consciousness has to do with art; it is an art to construct such an object and the object itself is an artobject. The artobject will not need any longer the artist. What does this tell us about the artist? Is the time of human artists gone? Or, is there something more in the story which only has not yet being revealed to us in the course of the game of life so far?

MARIA STUKOFF, JOHN POTTS, CHRIS CHESHER AND ANDREW MURPHY - Body: Vanishing Presence

Too often it has been suggested that the physical body has no significance in the computer matrix - only the mental body can travel along the wires. The body of flesh is (I presume the Human Body is signified here) left outside while our other self can travel the inner wonders of the computer space. Increasingly the terminology of a "split body" and metaphors of an "inner and outer" are ambivalently adopted to describe a difference, of other realities of space and body. More often than not the particular differences and what the actual effects of these appropriations have on the actual presence of a human being are never really specified. In the presumption that humans have a mental body and a physical body (an ideology I do not share) I will suggest in the paper that for the most part the ideals of a post-human is nothing but exaggerated vocabulary. The redesign of a human body in a Virtual world is nothing more than a representation, an image. The suggestion that the human body is to become obsolete as part of a natural progression of evolution, gives a wrong and naive picture of the truer developments of how a body comes to be what it is a development from hominid to being a technosapien. The suggested new forms of fugitive identities are on the virtual horizon, a fantasy dialogue that has become complacent in its assumptions. I am proposing that in order to represent the human body as a different, more technologically suited form, all aspects of the experience (the human body, mind, senses as well as the computer hardware and constructed image) must be present at the same time - otherwise a difference cannot be demonstrated. As an artist performing with my body in interactive environments I am interested in the futuristic application of a body. What are the possibilities in describing my physical interaction with technology? What is the importance of remaining a human body? What is actually meant in stating the BODY? I do not suggest that these questions are new but I do recognise that the direction of the current dialogue about a body and its representation

within a virtual space must take on a new direction, maybe a new appreciation.

John Potts - Space, Time, Body and World : Here, There, and Nowhere

Across the world, developed and developing nations are racing to connect their citizenry via fibre optics. Electronic networking is being asked to carry the hopes of brave new digital societies into a new millennium. The dream is of an electronic democracy on a global scale: dissolving hierarchies; offering universal access, untrammelled creativity, unlimited knowledge, empowering connectivity. Utopian dreams of the late twentieth century reside in this transforming power of information technology. The Internet, a global network of networks with no centre, has become the focus for hopes of a liberation through electronic interaction. The Modernist hope earlier invested in industrial technology has been displaced onto its post-industrial successor. Global connectivity relates in other ways to the long quest for Utopia. The dream of a common language haunts a system built on computer language. The very word Utopia, deriving from Thomas More's book of 1516, means "no place"; the Internet is a world-wide no-place. This technology of the immaterial, travelling at the speed of light, stands in a complex relation to Utopia.

Nell Tenhaaf, Elliot Handelman, Jeanne Randolph and Phoebe Sengers - Interpenetrations: Art, Science, Cultural Theory

If there is any overarching concern that can be identified in artistic and cultural practices of the past few decades, it would have to be named as subjectivity, and the examination of how it is shaped through various representational apparatuses. Some would protest the resulting self-consciousness, not to say politicization, of cultural production, probably most acutely felt in the theory-laden period of the visual arts from the late seventies through the eighties. But another, more interesting and pertinent result of this period is the recognition that the sciences too put forward, and indeed are built upon, representational models that are inextricably bound up with human subjects, their histories and desires. Paul Feyerabend outlines an epistemological relationship between the work of scientific researchers and artists in the following way: performing in their different styles and using different languages and skills, scientists produce results that often coagulate into entire but mutually exclusive worlds. These worlds cannot be detached from the languages or the methods used. Extending this point of view to non-scientific cultures, we arrive at the assumption that what we find when applying material, social, literary technologies to Being are not the structures and properties of Being itself, but the ways in which Being reacts to human interference. (From "Theoreticians, Artists and Artisans" in Leonardo, Vol. 29, No. 1, p. 27, 1996) Feyerabend's intention is not to collapse the two types of Research into one worldview, nor to prove how creative scientists really are. Rather, he reconsiders the interrelationship between material and theoretical processes in both art and science, with a view toward resituating the grand

search for truth, or at least for meaning, within culturally specific moments. One feature of our current moment is that, through technology, the sciences constitute a paradigm of collectivized desire. Technologies are the meeting ground between theory and practice where this desire manifests, with promises to improve the functionality of the soma and the psyche, as well as to heal the wounded soul: the appeal of Virtual environments / cyberspace / hyperspace is its promise of an infinite expansion of the perceptual world; artificial intelligence, artificial life and genetic technologies are to reveal the complexities of human behaviour and its evolution, and give us control over destiny and mortality. There is no intention here to criticize the goals of scientists or developers of technology, nor to appropriate trendy science metaphors for cultural theory. Instead, the proposal of this panel is of a more generally intellectual nature, which is, to consider ways in which complex, layered representations can keep subjectivity, the social world and also the natural world fully in view. The idea is that such a point of view is important for any designer of a Reality model, be it artist, theorist or scientist. After C.P. Snow's *The Two Cultures*, a recent book expands on the idea of a third culture consisting of "those scientists and other thinkers in the empirical world who, through their work and expository writing, are taking the place of the traditional intellectual in rendering visible the deeper meanings of our lives, redefining who and what we are." (John Brockman, *The Third Culture*, Simon and Schuster, 1996). The great men (sic) of letters are a thing of the past, Brockman declares. This statement drops like a lead weight into the ferment of a cultural scene that is not necessarily interested in replacing one intellectual pantheon with another, nor in accepting the idea that the sciences are overtaking other knowledges in constituting culture. But what we have until now called culture, in a literary and artistic sense, is beginning to recognize the problem of how to engage with scientific enquiry. This has come about via the burgeoning of technologies that very obviously have a cultural impact. Some of the current debate among creators of reality models concerns the empirical basis of those models, and seems to be distorted rather than enriched by the interdisciplinarity of the "third culture." As one school of thought applies social and political critique to the history and practices of science, an opposing school feels that this politicization ignores and undermines the crucial claim of scientific work to facts and truths based in the natural world. This has become a completely polarized argument, and not simply polarized between the cultural domain and the scientific one. A recent manifestation of its vituperativeness appeared in a report about a hoax article by physicist Alan Sokal which was published in the "post-modern" journal *Social Text* (The New York Times, Sunday, May 26 1996). Sokal's paper was couched in pomo jargon, but deliberately included gross errors and misrepresentations meant to catch out the journal's editors. They meanwhile perceived it as an important gesture on the part of a hard scientist to be engaged with current cultural studies issues. This incident does point seriously, if cynically, to the question of expertise even as it reinforces the belief that science (and in particular, physics) is the discourse of ultimate authority. This is the cultural context for our panel, its backdrop. The crossovers of areas of interest and expertise on the panel are these: music with cognitive

science, Eliot Handelman; art theory and criticism with psychiatry, Jeanne Randolph; cultural studies with artificial intelligence, Phoebe Sengers; and visual art with biogenetics, Nell Tenhaaf.

ROUND TABLES

Josepha Haveman - Bridging the Gap (Education as a way of bridging the gap between artists and technologists.)

This discussion will focus on the efficacy of education as a possible bridge between art and today's highly technological media. Artists throughout the ages have used, if not invented, the highest technology available to their culture. Creating art has traditionally involved relatively high technical skills. Along with a talent for creativity, spiritual sensitivity and a well-trained eye, a good command of the medium has routinely been a prerequisite. Even lately, when using simpler ready-made art supplies, developing adequate skills and an understanding of the tools requires time and dedication. Today's newest tools are little different in that respect. Study is as helpful with the new media as it is in learning to play the piano. For the talented, time and practice will lead to the desirable skills. Many artists may benefit from scholastic assistance in dealing with technical complexities, but even more to the point, proper education provides an understanding of the revolutionary nature of new, magical media! Computers now afford an opportunity for exponential expansion for the arts. Today's multimedia is really 'mixed media' and these mixed media are recombining and mutating into new varieties of potential. Virtual Reality (VR) and Artificial Intelligence (AI) are examples of major new features that are poised to enter our personal art. Such phenomena have changed our perceptions of space, time and forms of dynamic expression. Traditionally, art created with any medium, is delineated by its culturally proscribed standards and functions. Eventually these fluctuate with the shifting of cultural priorities. Rapid changes demand ever more involvement from education at all levels. The educational system must provide the perspectives required for understanding new directions as they develop and we better decide on the essence of what needs to be taught and who, today, is equipped to do so! It is the meaning and the enormous potential of the digital revolution that provide the important issues, which are affecting the future of our entire society! While both the pursuit of art and of education are infinite and will sustain our cultures throughout their existence, techniques change according to a law of progress. Yet technology is finite. We can always count the number of its parts. We shape the technology before the results shape us!

Addendum/message:

Many related issues rise to the surface in discussing this question of art, education and technology. There'll be no time to cover all the ramifications during the 60 minute 'round-table' discussion. Therefore I will place more on this subject on my web site. (That'll be all the ideas and comments that had to be edited out from this version!) Look on the page called [round-table] in the [symposia] section. All participants in the ISEA96 Symposium are invited to read more about the issues related to this panel and to comment by way of an on-line dialogue. Send comments to my e-mail address: JosephaH@AOL.com The web site is:

Richard Povall: Aesthetic and Compositional Issues in Interactive Systems

This roundtable would ideally be presented as a discussion forum AND a kiosk*. The kiosk would make experimental artists' CD-ROMs of relevance to the discussion available to individual viewers. The roundtable is intended for practicing artists with experience of, or with an interest in, interactive media, especially interactive performance media. Artists, authors, and experimenters are invited to bring work examples to illuminate the discussion (by prior arrangement with the roundtable convenor). The terms "realtime systems" or "interactive systems" beg a host of compositional questions. Just what do we mean by interactive?, what can interactive compositions possibly be?, how does interactive performance affect our sense of the composed or designed time domain, our perceptions of how time is organised and how it passes? What are the aesthetics of interactive work -- do they differ from aesthetic value judgments in more conventional frameworks? There are, of course, many realtime interactive systems, ranging from a simple MIDI keyboard with preset sounds, to the most complex multi-CPU systems. For the purposes of this debate, a certain level of complexity is assumed. Crucially, the systems implied here involve a certain degree of automation or machine knowledge -- a light operator in a stage booth could be said to be operating a "realtime interactive system", and possibly with some validity -- but it is not what we mean for the purposes of this forum. All too often the role of the artist is rarely questioned within these interactive systems. Certainly, within score-driven interactive music systems, the composer is still at the top of the creative hierarchy, creating a interactive sonic environment controlled by a performer's playing only in the sense that it responds to the interpretative gestures of the musical performer. A score, nevertheless, is regurgitated with a high degree of repeatability. In looser environments, an artist will often cede certain sections of a piece to a performer in the guise of improvisation. Working with environment-driven interactive systems takes this one step further: the composer creates not just improvisational sections, but environments in which the performer plays/moves/gestures/speaks. In turn, these approaches call for new ways of making work -- new creative and compositional methodologies that are likely to be a centre of discussion at this roundtable.

Cynthia Beth Rubin : BREAKING THE CODE: Art that Does Not Stand on its Own

Traditional wisdom has it that the successful art object should stand on its own, without the need for further explanation. Implicit in this statement is the understanding that the viewer will be initiated into the cultural codes of the artist, or, more commonly, that they operate with the same cultural codes. The "World Wide" nature of the Web, and

of modern society in general, renders such assumptions out-dated. Furthermore, the very format of the World Wide Web is in opposition to the concept of the stand alone art object, as it invites links from image to related textual information to another image to sound and so on. Museums and galleries post information on the wall, performers distribute programs, and books include introductions, but seldom are these read with the same intensity as parallel information on the Web. How does the widespread use of the format of the WWW for viewing art liberate artists from the idea of the work of art as a stand alone creation? Will artists be able to operate outside of mainstream, public cultural codes and references, by providing the audience with keys to understanding the context? And how will these ideas carry over into non-Web exhibitions of either static or moving or inter-active works? Will the Web provide the impetus for artists to include sources and alternative states of a work as an integral part of artistic presentations, both on and off of the Web? Can it serve as the model in bringing audiences to expect artists to provide context?

POSTER SESSIONS

**Peter Bosch and Simone Simons - A Music Machine
Balancing at the Edge of Order and Chaos.**

The parametrically forced pendulum is a well-known subject that has been thoroughly researched and documented by physicists within the cadre of order and chaos theories. Parametrically forced pendulums are activated by the up and down movement of their hanging mounts. Since the behaviour of these pendulums depends on the oscillating frequency of these mounts, the use of a vari-speed electro-motor is essential. As a consequence, the pendulums command an exceptionally wide range of movement; what can start off as a traditional to and fro swing can become an unpredictable and irregular motion leading to a startlingly vigorous full circumrotation. The Electric Swaying Orchestra as shown at ISEA'96 consists of six of such pendulums, each with a length of 1.50 metres. A microphone or loudspeaker is attached to the end of each pendulum. A computer controls the electro-motors and the musical process. However it does not have precise control over the consequences of its decisions. Although the movements of the pendulums are related to the oscillating frequency of their hanging mounts, at a certain point the behaviour of the pendulums becomes unpredictable and thus the musical outcome is unpredictable as well. The computer interprets the sounds received from the three swaying microphones and responds by playing new notes over the three swaying speakers. The main factors determining this live composed music are the unpredictable movement of the pendulums and the composition rules executed by the computer. It is a process which repeats itself endlessly; the computer is in fact constantly listening and responding to itself. Since 1995, we have been developing a new installation that furthers the concept of the Electric Swaying Orchestra: A machine that is capable of complex, chaotic behaviour and which produces music that is related to this behaviour. While the relationship between movements and sound becomes more sophisticated, it also becomes more apparent. The direction of movement and exact position of each pendulum will be measured as variables for the musical outcome, permitting greater control over the relationship between the movements of the pendulums and the music produced. Each pendulum might be assigned a specific parameter of one tutti live algorithmic improvisation (density, pitch, dynamics, for example), or each pendulum could have its own independent musical world. All pendulums are equipped with a loudspeaker - microphones are no longer needed - and they are much longer, two to three metres, providing larger movements and thus resulting in more interesting spatial soundeffects. This work is planned for completion during the course of 1996.

**Kat O' Brien - La Langue d'eau - my tongue my language
Corrosive edges and shifting channels in sexual and**

In the 18th and 19th centuries, human migrations from Europe radically changed the cultural environment of North America. Water was the main channel of this movement and generally unidirectional. In many ways, late 20th century electronic technologies have supplanted water as the exploration route. With this shift, the speed, direction and control of cultural exchanges have corroded conventional regulatory means. While the expense of these technologies is a critical factor, a powershift is nevertheless afoot for marginalized groups and individuals to inform and re-envision themselves and their 'communities'. The work shown in this session seeks to address a reading of history in which we respond with silence when our experience crashes into conflict with the current main stream and to begin reconfigure new connections rather than delivering authoritative conclusions.

In response to my own movement through these waters, I developed two sitespecific installation series, *Eau de Passion: An Ode to Passion* and its sequel, *La langue d'eau*; the first series followed a personal migration along the waters between Canada and the United States and the second continued eastwards to Ireland. The three installations in *Eau de Passion: An Ode to Passion* each explored a topic of particular relevance to contemporary women - the environment, partnerships and health. The installations employed fragments of local history in combination with images of the landscape photographically 'tattooed' onto the female body. The beveled edges of these self-portraits create the illusion of faux mirrors. The juxtapositions are further contextualized by debris collected along the shores of 'the route of the explorers.' These debris are incidental monuments left by generations of human intervention; in the installation, the objects function as metaphors for the last decade of our century, its complex issues of displacement, and the shifting cultural codes which are our collective and personal legacies and new 'territories.' The metaphor of water's edge provokes thought about the corrosion of boundaries, the power of contradiction, and the collision of passions. The female body as self-portrait grounds the metaphor in the personal - the mapping of sites onto the body locates the dilemma of a woman tending fires of private passion in the context of a societal landscape pulsing with diverse and contrasting demands.

The second series, *La langue d'eau*, is still in process. The first installation, *In the Wake of Grosse Ile*, was developed as a commemoration of the Irish who passed through or died at the Canadian quarantine centre on the island of Grosse Ile, Québec between 1832 and 1937. The work, constructed of 5000 tongue depressors formed into a wall fragment floating in the water near Dublin, remembers the historic and linguistic connections among the Irish, French and Canadians in Québec. It is often in the mother tongues, the mother's names or the mother's birthplaces that the forgotten connections lie. In the broader migratory sense, the work is about the ritual return to place for renewal and satisfaction of a hunger. Where are the tongues of women in these places today? What do we have to say, how do we say it, how do we receive what we hear? In the silences surrounding women's bodies and women's passions, much is extolled channels of information and cultural expansion, corrode established barriers or become

vessels quarantined offshore? Are voice and visibility a promise or a threat?

Michael Century and Christophe Ramstein - Multimodal Systems With Haptic Feedback

Multimodal systems present a new challenge of adapting computer inputs and outputs by using different media and modalities, depending on the user's tasks, skills, and preferences. Multimodal user interfaces provide users with multiple kinds of events, such as graphics, sounds (not only none-spoken sounds but also speech-synthesis) and haptic (or force) feedback. Haptic feedback is an emerging concept which consist of stimulating both tactile and kinesthetic senses. A haptic device is like a graphical display but instead of creating visible information, it creates touchable information. In addition, like computer mice, a haptic device is an input device: it allows a user to point to, select or manipulate computerized objects. However, unlike visual (or acoustic) displays, there is no universal haptic device, hence they must be designed and developed taking into account both technical and psycho-physical constraints. Haptic interfaces have numerous applications, such as virtual environments, artistic creation, teleoperated systems, computer access for handicapped or micro-gravity environments.

Remote Multimodal Interaction

Haptic feedback technology offers a new performance support system paradigm. Since a haptic device is used as the pointing device, it allows a system to physically guide the user's hand: for instance, quickly pointing to small icons, selecting the thin window frames, opening pop-up menus and selecting the right items. Our system is composed of two (or more) workstations running Windows 95 linked via a network. A user is put into a work situation and uses a haptic device as the pointing device. A remote peer monitors the user via a second machine which reproduces all or part of the first machine's reciprocal objects and actions. Thus, the peer is able to analyze and estimate, in real time, how and when it should take control of the haptic device and guide or suggest actions to the user. For example, in a training stage, the peer may notice that the user has difficulties with navigation tasks. The peer will then realize these tasks using a pointing device (e.g. a mouse). Meanwhile, remote haptic device will move according to the peer's mouse motions, giving the user physical guidelines. Since the peer also has a force feedback device, remote haptic interaction is bilateral.

Rob Fischer - Journey into the Living Cell

"Journey into the Living Cell" premiered at the Carnegie Science Center Planetarium in Pittsburgh, PA in December 1996 and has already been the subject of a CNN feature, a Wall Street Journal editorial and record busloads of students as well as wide public acclaim. It is a major example of art/science/technology collaboration. Excerpts from the

35 minute multi-media event will be presented including scenes of the audience interactive segments and exceptional computer images of the components that make up the cell. Discussion will include details of technological innovations, the collaborative creative process, and the next generation event already in the planning.

Rosa Freitag: Interacting with human characters: an engaging and rewarding interactive storytelling experience

Cinema and television are traditional electronic storytelling media, drawing much of their emotional power from characters and story. For that reason, storytelling in the interactive electronic media should introduce interactive characters and interactive stories to offer users engaging and rewarding experiences.

Interactive characters

Created as representation of a human being, an interactive character has her own mood, personality and deep character. If we use interactivity to provide a two-way conversation between the user and the characters, a real life relationship can be simulated. This interactive relationship can be stimulated by giving the user different opportunities for interaction, where he or she has the chance to explore the character's personality and give input which could influence the character's behaviour in the story.

There are certain aspects of the character's personality which cannot be changed with the user's input. However, as in real life, her mood could be influenced: opinions given by the user towards further actions in the story are very welcome. The more input the user gives, the greater will be the rewards on the development of the story and on the establishment of a "friendship" with the character. The result of conflicts could be a reward for user loyalty; constant interaction with characters can reveal their personality and maybe change her attitudes through the story.

Interactive story structures

To allow the simulation of real life situations and give users the appropriate rewards for a direct interaction with characters, an interactive story structure must be carefully designed. There is a number of narrative structures commonly used in platform games. Some combine linear chunks of story with puzzles, others branch in different directions to foldback to a same linear story. Yet none of them gives a real story payoff based on the user's input. Looking at the traditional media techniques, it is known that a good screenplay must contain elements of surprise and suspense to engage the viewer. On an interactive environment, if the user is given the chance to control the narrative development on a certain point in the story there is a high risk of failure in the delivery of an engaging story. The user is not supposed to be the writer of the story - let's leave that to the experts. I am creating models of narrative structures which give time-limited opportunities for interaction, where the user has the choice of interaction with the characters and the choice of not to interact, simply watching a linear film. The narrative flow never stops, and the development of the story will reflect the user's interaction. The "tree of nuances" is part of an innovative interactive storytelling structure I have developed. The diagram below illustrates the way it works: During scene 2 there's a "win-

dow of opportunity" for the user to interact. If the user chooses not to interact, the story continues linearly, to scene 3. The opportunity is to interact with a character, on a simulation of a two-way conversation. On the first node, the character will ask a question to the user, who can reply with a positive or negative answer by pressing buttons on a joystick. The following scene depends on this reply. There is a scene with a character's answer for "yes" and another for "no" on each node, and a linear default scene if there is no interaction. Depending on each answer, the character might reveal details of her personality or knowledge of the story, e.g., feelings about other characters. Note that answering "no" doesn't mean being negative to the character. For example, the character might ask "do you think I'm stupid?", and if the user responds "no" it's obviously a good choice if he or she wants to be "friends" with that character. This way, if the user responds according to the character's expectation, the "tree" can be explored in deeper layers where the character will ask more questions and progressively reveal more about her personality. Prototype demonstration *Mixed Emotions* is a Macintosh working prototype for an interactive film exploring the concepts of interactive characters and the interactive narrative structure described above. It uses full motion digital video with real actors and real backgrounds. The experience takes between 7 and 15 minutes, depending on each viewer's choices of interaction.

Ken Gregory - Cheap Meat Dreams and Acorns, about the audio installation work of Ken Gregory

Computer technology is maturing as a significant medium for artistic creation. Software is the defining element of current technology offering remarkable freedom to sculpt and mold sound. Creative audio work is approached through process and intuitive application of tools and ideas, using some things that I have built myself and discovery through experimentation. Raw audio, that is any recordable sound, is manipulated through various processes and reconstituted into patterns of pure sound or in a manner which plays upon new meanings when the original sound is fragmented, counterpointed against itself, repeated, duplicated, distorted, etc. Computers are perfectly suited to these processes and software creatively applied can be the defining element for audio work.

Poster Session I will be presenting documentation of computer controlled interactive audio installation work I have done recently including; *germ* originally *Monstrous* caused at ISEA95, under the influence of ether, an interactive radio transmission at the Western Front Lodge in Vancouver, and *Cranking Out Paradigms*; new work in collaboration with Lori Wiedenhammer. This presentation will encompass creative process, inexpensive sensor technology, and the Opcode Max programming environment.

Madelon Hooykaas and Elsa Stansfield - Personal Observatory

In our poster session we will show and discuss the interactive aspects of our sculptures from the series 'Personal Observatory' We will talk about three works in particular

and show documentation of them projected through drawings, slides and video tape.

1. "ABRI" 1994 an aluminium sound sculpture permanently located in the dunes facing the North Sea at Wijk aan Zee North Holland.
2. "Turning point" 1995 a video sculpture with an interactive sensor. The sculpture is made from the following materials: copper steel aluminium 2 LCD screens 2 videotapes computer/ custom built controller.
3. "RE: SEARCH" an interactive audio/video installation for a stone, a tree and a person. The sound in this work is recorded on many tracks of a C.D. and played off at random which also determines the position of the sound in space.

Matthew Jones - Conventional Art as Web-Based Exhibits - A New Electronic Art Form

Walk into any real art gallery, one with physical walls and floors. Art works hang on the walls or stand on the floors. Usually, they are placed not arbitrarily, or by chance but through a careful process of planning and thought by the exhibition curator. The curator will take account of the physical context of the "story" they want to tell. Which room would be best for a particular painting; what about the light for that sculpture? The characteristics of the space directly affect the design of the show. Many galleries and art academies, from the Louvre to the New York Met, are using the World Wide Web (W3). Those who are not yet wired are enthusiastically planning to be ... soon. It appears, though, that there is much less thought about how to use this electronic space to display conventional art. The W3 is mainly reproduces aspects of the physical reality of these places. For many galleries, this means simply displaying electronic versions of their paper-based brochures, publicity etc. For the more ambitious (and wealthy) institutions, the trend seems to be the development of sophisticated Virtual Reality views of their rooms. All these things have a place on the Web. But, great opportunities will be missed if art galleries, artists, and technologists fail to think about what new possibilities are opened by the technology - what can the Web provide that no visit to a gallery will ever give? The Interaction Design Centre at Middlesex University has been working with several major institutions including the Royal Academy of Arts (London). Through these studies, we have begun to explore ways of really using the power of networked art information. The flexible nature of hypermedia provides ways of both directing site visitors, leading them through a particular story, and a chance to exploit the visual associations they make outside any curators narrative. W3 interactive elements let people engage with the art - not just to passively absorb it. Visitors can also be brought together, to discuss and experience the art in such different ways to those possible in physical spaces. Putting conventional art works onto the W3 is an art form that requires artists and art institutions to 'use electronic technology as a prerequisite' - the medium needs to be exploited to form meta electronic art works. Without the sorts of technique discussed, users will soon lose interest in Web-based art galleries, ending up feeling disillusioned after they see through the haze of hype cur-

rently surrounding the technology.

James K-M and Carol Sill: Media Probes

The MEDIAPROBE Series explores interrelationships of ideas and sensory perception through multimedia. Comprised of text, audio and treated video, the series uses the simplest aspects of the multimedia medium to convey its message: the synaesthetic union of sight/sound/text as an iconic communicator.

Each MediaProbe is only 1 - 3 minutes in duration and works with text from Marshall McLuhan, James Joyce, Barrington Nevitt, Wyndham Lewis and others. For the viewer, the juxtaposition of texts and audio creates sensory tension which seeks resolution through emphasis on image. However, the viewer discovers that meaning can be perceived only through simultaneous open perception of the whole as an icon in itself. Compression of this information into iconic understanding occurs in the viewer in an instant of "giving up," similar to the effect of the Zen "koan". MediaProbes reverse our normal concept of interactivity. Instead of the viewer interacting with the presentation, MediaProbes present sensory interactivity, sending complex signals back to the viewer, whose limited interaction by mousedown is rewarded by the "probedclick" sent back by the synaesthetic icon to the brain.

Disparate ideas are forced into compressed interrelationships and much like a chemical reaction they become fused in a new form of iconic expression. Found images and sounds in the communication environment are combined with intentional imagery and text selections in a very controlled setting. Working with the minimum of input creates a reversal effect, which is formed by this forcing together of ideas originally expressed in different media. The only appropriate response for the viewer is a momentary internal synaesthetic short-circuit, an empty moment of "unlearning". We propose to present not only the MediaProbes themselves but also the theory behind them, involving a concept of the newly evolving synaesthetic iconic thinking (beyond non-linear) which this art represents.

The work is contained in a vertical rectangle which consists of four panels, each a discrete space. The two narrow side panels contain continuous green and blue text running vertically up and down on the left and right, alternating in content between James Joyce's ten thunders of the gods and McLuhan/Barrington Nevitt's decoding of these thunders as stages of technological development and humanity's response to it. When blank, on the upper panel are the initials MM, indicating Marshall McLuhan and echoing "multimedia". As the work progresses, this area is filled line by line with a quote from McLuhan's "Understanding Media". When new text appears, the previous text colours pink and remains. The lower panel when activated features an ongoing quicktime sequence of treated abstract video. At rest, this panel holds the GO button which flashes an image of McLuhan when clicked. Audio narration of the work is taken from a simultaneous translation of a

Canadian government inquiry broadcast this year. Due to the process of translation, the words spoken are halting, distanced from their content, and both questions and answers are spoken by the same voice. Interactivity with the work is minimalized, but it is set up to repeat until stopped. The thunders can be paused and examined but otherwise they stream by as an almost unreadable flow of alphabetic signs, bracketing the action in the centre of the piece. The entire work is flat, very "on the screen", with no indication of depth, no human forms to identify with. The human form, the depth, the awakening is all in the viewer, who completes the work through involvement, laughter, a shake of the head, a wondering how the hell to respond.)

Lane Hall and Lisa Moline - What's So Hard About Hardcopy ?

We love computers for bringing us powerful new possibilities for image manipulation. But we also love the good old physical properties and qualities of traditional paintings and prints: their scale, texture, materials, surface... How can we have the best of both worlds, especially if we don't have access to expensive, high output devices?

Our collaborative work has been an open exploration of this question of output. Compelling work always hinges on compelling ideas and images, but how can we make those ideas physical? We would like to present our explorations and discoveries, using slides, discussion and examples of work (small prints and books). We will discuss our combination of traditional and digital printmaking, focussing on these topics:

- large scrolls and modular scale: exploiting the multiple in installations...
- dot matrix impact printing: stencilling, transferring inks, direct printing...
- laserprint transfers with gum arabic: tiho printing without plate, stone or press...
- laserprint on mylar used as aquatint etching: if it holds ink, print it!
- exotic papers and materials for printing: Japanese and rag paper, "found" texts, metal leaf...

Our work is also an exploration of nature; the realm of the microscopic, the subjects of botanists and zoologists, the denizens of the compost heap, the humble and discarded. We feel we have some interesting insights into the integration of printmaking, physical process, the natural world, and digital technology. We like to sit down at the keyboard with both ink and dirt under our fingernails!

Our presentation should be interesting to anyone with a general interest in computer image making, eccentric techniques for achieving hardcopy, and visual art.

Michael B. Leblanc and Andrea Wollensak - The McLuhan Probes

The visual world is one of matching, or fragmentation, and of classification. The new multi-sensuous world is one of making in which space is not a cavity to be filled but a possibility to be shaped. MM, 1967, Environment as a

Programmed Happening The McLuhan Probes is a web site presenting an ongoing series of electronic, visually-organized and hyper-linked documents, made by senior visual communication students at the Nova Scotia College of Art and Design in Halifax and design students at Connecticut College in New London. The Herbert Marshall McLuhan Foundation's goal in supporting this project is to introduce McLuhan ideologies (through design projects and readings) to young designers who may not yet know of McLuhan and his influence in media theory and to reactivate interest in McLuhan among the generation who remember him as a 1960s guru. In addition, it provides a service to the general public in making McLuhan more immediate and accessible, by focusing the content of the Probes on short the McLuhanesque 'snippets' which McLuhan himself called "probes." The text of the Probes themselves is provided by the Herbert Marshall McLuhan Foundation, a non-profit Canadian institution which holds the electronic rights to McLuhan's work. This paper will address the theories and ideologies of Marshall McLuhan within an educational context reinterpreted by a young audience. The outline, design and pedagogical process for the Probes site will be described, with attention to technical elements of the project. In particular, it will discuss the difficulties associated with the Adobe Acrobat Page Description Format when it is placed in the context of HTML-based media; how important is 'accessibility' to the average Internet viewer, who may be interested in McLuhan but not have a computer capable of adequately displaying the Probes? Completed Probes (from current student work in progress) will be viewed online during the ISEA presentation. The selected Probes will illustrate interpretative image and hypertext works. The authors extend an invitation to ISEA participants (artists and designers) to submit probes for the 1996 McLuhan Probes project. All entries will be reviewed by the McLuhan Foundation in December. The results will be (funding pending) compiled onto a CD-ROM. <http://www.mcluhan.ca>

Peter Lunenfeld - Light in space: hyperaesthetic case studies

Emerging digital cultures have been more conducive to systemic analysis than to the close reading of individual art works. The next step in the development of a hyperaesthetics for the techno-culture is to delineate objects, spaces, and sites worthy of consideration in their own right, rather than simply as manifestations or harbingers of things to come. I propose to do a close study of the work of three artists -- Jennifer Steinkamp (Los Angeles), Christian Möller (Frankfurt), and Rebeca Bollinger (San Francisco)-- to determine how new media forms have shifted our apperceptive faculties, especially as they relate to the play of light in space. Steinkamp's lush imagescapes immerse viewers in shimmering fields of color and form. Her site-specific projections are predicated upon a finely focused production process, which involves 3-D modeling of the exhibition space, the rendering of animations on high-end hardware, the melding of image and sound, and finally the transformation of inert white walls into extruded, pulsating abstractions. If Steinkamp reacts to architecture with site-specific installations, then architect Christian Möller actively shapes the spaces in which imagery will be

deployed. In building hybrids of hardscapes and imagescapes, Möller constantly return to the question of the body -- as it exists in both real and virtual spaces. Where Steinkamp deploys light in physical spaces and Möller creates physical spaces to house light, Rebeca Bollinger virtualizes both light and space. In "Dorothy's Room" (1995), Bollinger has created a CD-ROM which explores the use of three dimensional software (here, "Quicktime VR") to reflect and estrange architectural space and the very process of vision. Here the flatness of interior light and the conventions of the cinema are deployed to investigate the very impact of the apparatus of new media forms on our apperception at the close of the millennium. This presentation applies the critical techniques I outlined at ISEA in 1993 in my paper "HyperAesthetics: Art, Speed, and Interpretation." The discourse around art has concentrated on the concrete object: painting, sculpture, and architecture. The advent of the computer, however, has destabilized these systems -- blurring categories and boundaries beyond even postmodern models. A dynamic object demands constant recalibrations in focus, a shifting between three temporalities. Hyperaesthetics demands theorization in real time -- which is what I will be offering here.

Jacquelyn Martino - Without a Special Object of Worship

"Without a special object of worship" is an interactive installation exploring imagery inspired by the salt-beaten Veneto-Byzantine port city of Venice, Italy. A handmade picture book is the device through which the participant controls computer based still images and animations. In the dimly lit installation space, the participant can sit at a table and turn the pages of a candle-lit artist's book. Custom electrical wiring allows communication between the book and the computer with each page of the book corresponding to complementary digital 2D image sequences and 3D animated sequences. The sequences appear on a monitor at the table. All of the imagery, both in the book and stored in the computer, consists of the artist's original stills and animations. The juxtaposition of the book and the digital imagery serves to bring the book to life by adding motion. The environment is further enhanced by an original sound track inspired by chants and religious liturgy. The integration of image and sound creates a peaceful, sacred space conducive to reflection. While the installation is not specifically religious in nature, the experience could be likened to the very personal acts of meditation and prayer. Much as a prayer book, the handmade book acts as a point of departure for these acts. The book structure is the vehicle through which the participant communicates, controlling the pace of the interaction and thus customizing and personalizing the experience.

Robin Noorda - Horses in the Air; VR Techniques In A Linear TV-Programme: The Making Of...

Virtual Characters and Virtual Stage

April 96 we presented the pilot 'Muybridge' at the MIPCOM in Cannes. In this paper I want to tell you about "The making of Muybridge"...

'Muybridge' is one of a series of five art programmes of 25

minutes each. The episodes are based on great, but not always well known or recognized, inspirators and pioneers from the late 19th century, the previous 'fin de siècle'. Each episode is a piece of music, dance, design and animation mixed with very short fragments of graphical historical information. The first episode is about Eadward Muybridge, a photographer who unintentionally laid the foundation for the cinema. The other episodes will cover the life and works of Tesla, E. Plankhurst, Max Planck, Freud.

Framework and Techniques used

Each episode is an artistic interpretation of the life and work of the protagonist. 'Horses in the Air' is visualized by integrating traditional as well as the latest techniques and disciplines in order to connect the fin de siècle of the 20th century. Unprecedented combinations of disciplines and formed to stretch the boundaries of contemporary television production. In this way each episode will obtain an different approach in contents, character and design. By means of the use of virtual stage, motion capture and computer animation new ways of expression and visualization are being explored. The combined choreography of the dancers and their co-players which only exist in cyberspace do cause a dynamic tension. Although dance has an important role one cannot say that the episodes are purely dance pieces. Movement is the most important ingredient. The movements of the dancer or dancers function as a kind of animation controller. In some episodes the tool of dance as an animation controller are replaced by other to be captured movements, for instance a moving hand or a movement in the music. This new approach in the way of handling the contents, the cooperating disciplines and the innovative realization techniques will result in a 'state of the art' series of television programmes.

Roc & Narcis Pares - MACBA en Imnia

MACBA en Imnia is a technocultural project which results from the collaboration between: MACBA (Museu d'Art Contemporani de Barcelona), UPF (Universitat Pompeu Fabra), IUA (Institut Universitari de l'Audiovisual) & Galeria Virtual. Its main action lines are Research, Experimental Production, Reactivation.

1- Research Situating research and debate around Museological and Audio-visual Language Confluence: To overcome the cliché of objectuality which states that: if art = object then museum = container. To overcome the cliché of objectivity which states that: if image = document then audio-visual = representation. Interdisciplinary Contributions: In artistic production: Specific properties of new media. In museology: Public digital space. In multimedia design: Design information. *New Metaphores/ No Meetaphores*. In art criticism: Hypertextuality & Virtuality. In applied computer science: Distributed Virtual Environments. In psychology: Human Computer Interaction. Implications: Political-economical: Multi-institutional international cooperation. Ethical-economical: copyright?, intellectual property? Social: Access for all? 2- Experimental Production The World Wide Web (WWW) is a set of applications on Internet in constant growth, which allows international transmission of multimedia information. The qualities of the net as a medium for presenting information of museums are already being studied by the

the most prestigious and innovative. Besides this divulging utility for the conventional activities of museums, there is an enormous field to explore by taking these resources as a medium for art, criticism and museology. MACBA en Imnia has decided to tackle this challenge through the following initiatives: Works: They will be produced by local and international artists invited by MACBA en Imnia to produce their proposals especially thought for this medium. Artists will have the support of the staff of MACBA en Imnia, both for the production and distribution of their works. Conferences & Forums: They will be held based on criticism or informative texts (preferably hypertexts), related with issues of contemporary art, technoculture, criticism, museology, etc. The invited authors acquire the commitment to give public response (during an agreed period of time) to all questions that arise from their works.

3- Reactivation MACBA en Imnia, being aware of the technocultural deficit in our country, makes its means accessible to groups, entities and associations which are dedicated to contemporary art in our cultural panorama. The museum adopts the role of reactivating the creative tissue in our society. The confluence of languages (museological and audio-visual) implies a whole series of interdisciplinary contributions to the ambits of art, technology, design, criticism and psychology, which must be analysed and taken care of whilst new ways are opened. With this vocation, the *Beques de recerca i producció experimental en xarxa IUA-MACBA* (IUA-MACBA Grants for research and experimental production on the web) are created. The collaboration spirit between the Museu d'Art Contemporani de Barcelona and the Institut Universitari de l'Audiovisual of the Universitat Pompeu Fabra is based on their mutual interest for this common research ground which is found at the junction of contemporary culture and technology

Ian Pollock and Janet Silk - Intimacy, Concept, Interaction

Pick Up The Phone.

Visionaries with ringing in their ears take the higher calling. Heidegger took the call. Bell took the call. The flame dances inside the machine. The flame is controlled by the vibration of the voice interpreted by a membrane separating the two worlds: the world of the speaker and the world of the listener. The telephone communicates between two worlds, the world of fiction and the world of reality.

Take the Call

We are artists using the telephone as a medium for transmitting our work. The telephone, different from radio, is unique in its structural intimacy, the impact of the work is heightened by the physical relationship of the phone to the listener's head. What's your number?

The phone is an ideal tool to locate issues in our society concerned with the mythologizing of technology and the pervasive narrative of Science. Our installation, *Museum of the Future* specifically targets these issues by relaying narratives about fantasies of the future in the past and the present via a voice mail system. Another telephone installation, *Area Code* utilizes the public phone as a transmitter of local histories, engaging the listener with perceptions of the site over time and contemporary social issues that are traced across time in an ongoing political discourse. For

Local 411, we will be using the phone as a transmission device to call out into the newly opened Museum of Modern Art and Yerba Buena Center for the Arts. We will be delivering stories about the residents who were forced to give up their homes for the expansion of these cultural institutions.

I'm cutting down to 10 calls a day.

A very transparent medium, the telephone is often overlooked as a technological device. Its use is pervasive, telephonic art implies a world-wide audience. In the early development of the telephone, there was much discussion about its impact on existing social structures. Laws and social etiquette were questioned and eroded as the phone became a means to contact anyone at all times across class, race and gender boundaries. Our voicemail installations engage with a broad audience, encourage feedback and integrate response into the piece itself, or allow for a listener critique.

Look at me, I'm talking to you.

The first phone to transmit pictures as well as sound was demonstrated in 1927, AT&T spent over \$500 million on development of a "Picturephone," but sold only a few hundred devices. Ultimately, the Picturephone failed. No one really wanted to see the person they were talking to.

I have another call coming in, can you hold please?

Rigidly coded concepts of what is appropriate phone use predetermine its ability to exist as a medium for art practice. In the early years these lines were less defined.

Throughout its short history, there are many interesting examples of using the phone as a transmitter of cultural and entertainment programs. An open-ended channel of communication - a line whose limits are only the result of the fears of the society it exists in - telephonic technology, like other technologies, reveals that the initial intention which fueled its development was greater than its final form of expression. We hope to remind people of this paradox. Contrary to the dominance of visual culture, the telephone is a refuge for an intimate exchange between artist and audience. Close to your ear, the artists are confessing their desire to connect with you. You have reached a number that has been disconnected or is no longer in service, if you feel that you have reached this recording in error, please hang up and try your call again.

Niranjan Rajah: LOCATING THE IMAGE IN AN AGE OF ELECTRONIC MEDIA

As East Asia accelerates from medieval culture and consciousness, through a compressed period of industrial modernization, into the communications era; the convergence of living sacred traditions and information technology presents a deep ontological enigma. Starting from the premise that the 'image' is an index of the 'locus of reality', this poster session will attempt to 'locate the image' in an age of instantaneous communications, virtual reality and hypermedia. In etymology, the word 'image' is linked with the Latin 'imitari', which is the root of the word 'imitate'. In the Medieval view the likeness between any thing and any representation of it must be analogical. Here, 'analogy' is 'similitude' in the sense of 'simile' rather than that of 'simulacrum'. Medieval representation imitates the idea of the thing and not its substance.

From the Islamic standpoint, the law of all phenomenon

can be symbolised geometrically in the way that space, seen as extension, is created by unfolding through the dimensions and can be 'folded up' again, leading back to the point of unity. The confusion caused by sculpture in the round, chiaroscuro, perspective and other illusionistic representations in the process of folding up explains the prohibition of images in Islamic art.

The image of a Hindu devata, latent in canonical prescription, must be inwardly visualised by the icon maker in an act of 'non-differentiation'. This inner image is the model from which he proceeds to execute in a chosen material. The viewer in turn applies his or her own 'imaginative energy' to the physical icon, 'realising' the devata within the 'immanent space in the heart'. All images are interior and reality itself is imaged within consciousness.

In modern consumer capitalism everything that was once directly lived becomes representation as images proliferate outside of the viewers control. This 'spectacle' has been described as capital accumulated until it 'becomes an image'. It is the 'televisual' image of our desires; of desire itself. It alienates us as it permeates our consciousness. In works like 'Theme Song' (1973), Vito Accorci assaults the limit of this image. He implicates the viewer and paradoxically compounds the alienation of a medium that promises interaction but does not permit it.

Today the 'alienation of the spectacle' has dissolved into what has been called 'the ecstasy of communication'.

There is a 'loss of private space' and simultaneously, a 'loss of public space'. This is the ontology of Paul Sermon's 'Telematic Dreaming' (1993). With electronic interactivity, the body appears to be situated wherever 'its effect is'. Enabled by 'microtechnology', consciousness has left the physical body and merged with the image in an interactive 'outer-space'.

Sonya Rapoport and Marie-José Sét: Brutal Myths

In this poster session, we propose to discuss our use of the Internet as a medium for presenting our interactive artwork: Brutal Myths. This piece is inspired by the *Malleus Maleficarum: The Hammer of Witches*, a medieval manual for witch-hunting from which fallacious myths were derived. Brutal Myths is about misogynous mythology and the physical and mental mutilations that developed as a consequence of their perpetuation. Our collaboration as artists is part of this project. The presentation will initially introduce our artwork "Brutal Myths" with a selection of slide projections and audio excerpts of conversation recorded during the creation of the piece. The scope of "Brutal Myths" includes educating and raising awareness of the mythological fallacies that plague women in the US and elsewhere in the world. We contend that these myths originate in our culture from the Judeo-Christian tale of Genesis and from the assumption of the guilt of Eve, motivating misogynous practices grown out of men's fears of women. The myths we describe and the measures of control, mutilation or brutality used in their names to subdue women, follow a plan inspired by the sadistic fantasies about women found in the *Malleus Maleficarum* (The Hammer of Witches), a manual for witch-hunting written in the XVth century. The witch is the embodiment of the "guilty daughter of Eve." The witch-craze is the epitome of the resentment over women that

lasted from the XIVth to the XVth century. As well as historical sources, contemporary examples of mutilation and repression of women are described in the work, such as: limited female education in Muslim countries, sexual mutilation in Africa, and the obsession with fad diets and cosmetic surgery in the USA

In Genesis, God condemns man "to toil in the field to eat of the herb". As well, women were traditionally the lay healers in ancient herbal medicinal practice. These support our use of herbs as a metaphoric interface throughout the piece. The first half of "Brutal Myths" describes which "evil" herbs contaminate the minds of men into believing the *Malleus Malificarum* dictums. In the second half of the work a "blissful" herbal garden is created by planting "blessed" herbs. Interactive rituals acted out by the viewer are intended to destroy the prejudicial myths and allay the fears of men. Creating this work presented many challenges that are reflected in the audio "arguments" that we shall then discuss. First, as women we are aware of the unequal representation of female art and work in the official scene, dominated by male artists. The Web represents a "free" and easy outlet for women's work, by-passing the galleries, buyers and museums. This is our contribution as women to the development of the Web as a new artistic and technological medium free of sexual prejudices and differences. We wish to maximize the interactive potential offered by the internet and hope to reach an audience who might never go to an exhibition. The attractive features of the web allow us to link our work to botany, women's history and anatomy, mythology and religion and proposes, as well, that participants further their and our knowledge by contributing misogynous examples to our piece, or links to related material. Secondly, the making of this project involved the interaction of two very different women, with disparate attitudes. Although we are separated by age (a generation apart), by culture (Mediterranean and Bostonian), by religion (Catholic and Jewish), by social background (provincial petite-bourgeoisie and urban upper-middle class), and by nationalities (French and American), we managed to meet on common ground both as women and as artists. It is the history and exceptional quality of this seemingly unlikely collaboration that will be commented here as illustrated in the audio recordings. Especially difficult were our opposition on feminist and artistic issues. Implied in the interaction is our attitude about the role of men and women in contemporary society, correlated by our individual fights to control the art work. Finally, was the difficulty of creating an original artwork that transcends the political, cultural and educational implication of the material. Our discussions reflect the bi-polarity of the following questions: what is an artwork now? what can and will be an artwork on the web? what will differentiate our work from a dry dissertation or an exposé? What should the proportion of verbal to visual material be? All these are eventually answered in the structure of *Brutal Myths* as a fantasy and metaphoric exploration of the origins of misogynous myths and their alleged cures.

J. Ignasi Ribas, Xavier Berenguer, Pere Freixa - The Handling Of Poetry In Interactive Media: The Case Of A Cd-rom Production On Catalan Poetry

One aim of the "Institut Universitari de l'Audiovisual de la Universitat Pompeu Fabra" (IUA-UPF, Barcelona) is the production of interactive multimedia supporting the main research and educational activities and the dissemination of minority cultural knowledge through new digital media. Through these productions we want to bring together the research in multimedia design with its practical application and testing. We study the relations between interface, content and user personal characteristics, and also the possibilities of these interactive interfaces as a new creative and expressive forms. As all other activities in the IUA-UPF, we explore, on the one hand, the new ways that electronic art in general can open and, on the other hand, the application of these media to old artistic forms. Related to this second approach to interactive multimedia, our first production is "Dotze sentits. Poesia catalana d'avui" (Twelve senses. Today's Catalan Poetry), a CD-ROM made in collaboration with "Editorial Proa" (a catalan publisher) and "Diputaci de Barcelona" (a public regional institution). It is based on the works, lives and ideas of twelve living catalan poets. The CD-ROM has won the Spain and Portugal Möbius award, and has achieved an increasing success among local audiences, either general or poetry interested. We think this can be a good example of a way to approach poetry, an old and mainly textual or verbal artistic form, to the general public using the new language possibilities that interactive media offer. Through the design of our product we have tried to accomplish two main objectives. First, a user interface as transparent as possible in order to guarantee the fast and easy approach to information by people that are in principle interested only in poetry. Second, to create a surprise effect and promote the desire to exploring the CD-ROM, offering a collection of multimedia possibilities that probably the user never expected. With this aim the CD-ROM contains a set of different and specific multimedia materials: poems performed in video or audio by its authors, manuscript views, text and fonts animation, interactive and video interviews, and poets' personal photographs, objects, works and hobbies commented by him or herself. We include also a more traditional encyclopedic approach which offers to the specialists a very exhaustive and textual information on biography, bibliography and the contents of articles about each author and contemporary catalan poetry in general. This information can be printed if desired. A third playful approach uses a theater metaphor with animation and audio elements to propose a poetry reading in video with a personalized list of poets. A very engaging and clear graphic design increases the user-friendliness of the interface, minimizing difficulties and reject and making easy the approach of a non initiated person to multimedia products towards this multimedia handling of poetry. As a summary, in this presentation we will discuss our approach to handling a classical art, such as poetry, with multimedia language through the particular case of this production.

Derek Richards - Permanent Revolution

Conceptuel design, music, programming and video by Derek Richards Still image generation by Mark Perry Programming assistance, Estella Rushajja Permanent Revolution part 2 is an exploration of the role

that convergence of migrating peoples and the resulting fusions play in the development of new cultural forms. It poses an alternative to the groping for representations of cultural purity and homogeneity within the reactionary construct of a race as a response to oppression. It proposes that all cultures are born out of the fusions of those of migrating peoples- whether such migrations are voluntary or enforced. With *Permanent Revolution* I have attempted to create a piece of work which straddles both the areas of entertaining work at the cutting edge of interactive technology and content rich, issue based material.

Martin Rieser - Interactive Narrators: Educating the Authors

Strategies for developing intelligent scripting, visualisation and implementation of narrative based work at undergraduate and post graduate research level at the faculty of Art, Media and Design at the University of West of England, Bristol. Illustrated through a selection of diverse student work

Patricia Search - Hickory Dickory Dock: The clock strikes one in hyperspace.

This paper discusses critical issues in the aesthetics of space and time in interactive computing. *Hickory Dickory Dock* is an art installation that highlights the conceptual and aesthetic limitations of language and symbols in human-computer interaction. The artwork also comments on many of the myths and illusions surrounding interactive electronic media. Interface designs in interactive programs emphasize the use of spatial references for navigation and orientation. However, little focus has been placed on the temporal dynamics of navigation in interactive computing. In fact, most interfaces use words and symbols that represent a Western perspective of time which is not always appropriate for the non-narrative structure of interactive programs. The installation *Hickory Dickory Dock* is a three-dimensional layout of the storyboard for an interactive computer artwork. Twenty-four screen designs from the storyboard are displayed back-to-back to create twelve viewing stations that are arranged in a formation resembling the mathematical symbol for infinity. The documentation that accompanies the exhibition consists of twenty-four cards mounted on a ring. The cards contain the author's programming instructions for the storyboard. The screen designs and the documentation contain numerous linguistic and symbolic references to Western definitions of time. The installation demonstrates how computer interfaces use Western labels and categories to limit the interpretation of space and time to specific cultural perspectives. The three-dimensional layout of the storyboard plays an important role in delineating the limitations of symbols and language in the computer interface. The installation forces the viewer to reevaluate the metaphors and interactive conventions (mouse, keyboard, touch screens) that have become an established part of interactive computing. The viewer must make the conceptual leap from abstract temporal references to concrete logic by translating the commands and symbols in the two-dimensional interface design into movements and actions in the three-dimensional environ-

ment. In the process, the viewer realizes that many of the symbols in computer interfaces are derived from the perception of three-dimensional space and therefore, do not map directly to the two-dimensional computer screen. These paradoxes are further emphasized by the use of Western classical music in the installation. The music, which is experienced through infrared headsets, is a constant reminder of the formal structure of time in Western cultures. Like the symbols and language in the storyboard, the music underscores the dichotomy between discrete mathematical references to time and the ethereal, continuous representation of time that we experience in a three-dimensional space where events and actions, rather than numbers, define temporal relationships.

Marius Serra - Babble: The Virtual Tower of Babel.

Babble is a Virtual Reality experience which takes advantage of the new technological channels to revive the debate around the babelic myth. *Babble* is a Ceremony of Confusion. The user becomes transient of the Virtual Tower of Babel. It is a fully immersive experience which uses a head mounted display. Before entering *Babble*, the user is given an explanatory leaflet in thirteen languages, designed in the fashion of the instructions of an electric appliance. When the transient enters *Babble*, he finds himself in a walking space completely surrounded by water. This space consists of a boulevard which leads to an octagonal square. The Tower raises at the centre of this square, helicoidal and infinite in height, which reproduces the structure of DNA. The boulevard is full of perched parrots of thirteen different species. Each one shows a unique behaviour and sound. The transient must choose one to accompany him in his ascent. Only accompanied by a parrot will the transient be allowed to penetrate the interior of the Tower. Inside, the only way to go is upwards. *Babble* is Ascension. The parrot chosen as trip companion is the main reference for the transient of *Babble*. It always precedes him. The parrot is the measure of all objects. It moves or stands still in relation to the progress or immobility of the transient. Throughout his ascent, the transient encounters a series of stained glass windows on his left. *Babble* is Light. Every time the transient enters the field of view of a stained glass window, a message associated to the window is heard. Each new window turns on the playing of its sonorous message. *Babble* is Confusion. The first transient to enter the Tower will already find a hundred and sixty nine stained glass windows previously generated by the artificers of *Babble*. *Babble* is Tradition. *Babble's* tradition has been introduced by its artificers by producing several distortions on thirteen base stained glass windows, each of which contains the image of one of the thirteen parrots. The base stained glass windows are not textures. They have been modelled in 3D by vectorizing the image of each parrot into polygons. A distorted window is obtained from a base window and an oral message with a limited duration of thirteen seconds. The samples of the oral message serve as a chain of parameters, which conveniently re-scaled, are used as a deviation for each of the components of the vertices and the components of the colour of every polygon. In the same manner, *Babble's* tradition is increased by the contributions of the transients. The oral

intervention of each transient distorts in real time the base stained glass window associated to its parrot. The new subversion of tradition in the shape of a sonorous stained glass window substitutes the one that occupied the same location. The previous window and message are finally located at the top of the Tower, which grows with each new contribution in its arrogant goal of reaching the ultimate sense. Babble is Growth. After hearing himself, the transient suddenly starts a free fall from the height he reached to the base of the Tower, where everything blackens out. Babble is Failure. The Tower of Babel that Babble proposes will not outlast the myth. A mechanism of virtual self-destruction has been provided, which will cause the collapse of the Tower with all the stained glass windows that configure it at that moment and will delete the computer files that contain the information that makes them possible in the virtual environment without possibility of recovery. Babble is Annihilation. This mechanism is activated by a message previously introduced by the artificers of Babble. Any transient may detonate it. If a voice recognition system incorporated in Babble detects a remarkable phonetical similarity between the transients and the artificers message, an apocalyptic ceremony of destruction will start. Babble is Infarct.

Josephine Starrs - Gameplay, vapourware and digital aberrations in the age of information fetishism.

Is the computer game a perfect way for artists to infiltrate pop culture? In this presentation I will look at the blurred line between computer game and interactive artwork and the problems artists face when trying to produce games. For example conservatism in the industry itself or draconian games classifications such as the ones being now implemented in Australia. Can gameplay produce meaning and culture? Is pleasure an important part of the art experience? Anticipating the action that will result from your touch, click, turn of the track ball or flick of the joystick creates moments of intensity which may empower or may manipulate the user. Is it the artist's role to do one or the other or both? In games we can play with ideas of subjectivity through body options, weapon options, various forms of representation and the interaction with imaginary spaces. Gameplay especially on the internet is enabling us to indulge in multiple personalities and explore strange shifts in our own subjectivity. In the rush to leave the meat behind, the disembodied self is relishing its new found flexibility and freedom. But the desire for and obsession with information seems to be reaching fetishistic proportions. We are constantly handing over information about ourselves to the point where it reinforces our identity to do so. I am digitised, therefore I am. I will explore these ideas through discussion and presentation of various interactive artwork/game/vapourware projects I am currently involved with such as "Fuzzy Love" and the "User Unfriendly Interface" produced in collaboration with Leon Cmielewski, VNS Matrix virtual theme parks and "Bad Code" a computer game being produced in collaboration with VNS Matrix artist collective.

Wolfgang von Stürmer - Benefitting modern composers - how to utilize the future when creating the

Internet reference for new music!

ARCANA was developed by the German composer Wolfgang von Stürmer in April 1995 and is the first non-profit Internet-service which is solely dedicated to promote contemporary music globally. Currently, the project resides in the WORLD WIDE WEB. It is the purpose and goal of ARCANA to disseminate information about and from composers, ensembles, organisations and producers of contemporary music and to become the Internet reference for new and experimental music. Its main focus though, is the work of modern composers. ARCANA is open to all composers working in the field of contemporary music. Additionally, one of its specific tasks is the promotion of young, (not-yet) established composers and their work. We fulfil this function by representing the composer's work in sound and vision, via the integration of an interactive information-exchange and electronic bulletin-board, and by active promotion of ARCANA in the Internet and the media. Hence, ARCANA does not act as a direct agent for the composer but offers support and counselling and provides the Internet platform for promotion and representation. In ARCANA, all composers receive their own unique URL. Therefore composers can reach an international publicity by presenting biographies, text material, work lists, and for the first time worldwide: score excerpts and other visual or graphical examples of their work. Moreover ARCANA revolutionises the standard of work presentation and makes it more vivid! Since May 1996 sound examples can also be heard in real time via RealAudio(tm). Additionally they can be integrated into worklists in all usual soundfile formats, available for download. Moreover, MIDI-files may be utilized to provide a more concrete impression of unperformed compositions than mere text descriptions. It is possible to provide piano extracts of a larger instrumental score which can be played back with a MIDI-player, too. The integration of Live-Video-Streaming and RealAudio-Live programs as "Virtual New Music Radio" is in development and will launch this fall. This combination of visual, textual and acoustical information gives a precise picture of the composer's work. Given access to the Internet producers, conductors, publishers, festival directors and music professors and teachers are able to get excellent first-hand information and views of criteria for program- and repertoire planning and are able to contact the composer directly. ARCANA also offers composers a basis for professional contacts mutually. The communication among one another is supported via email (or telephone and fax, if not available) as well as any feedback or info sent to ARCANA is automatically forwarded to the composers. Every two months the ARCANA NEWSFLASH is published. It contains reports about the development of ARCANA and is available free of charge via email. Since January 1996 the international communication among the composers is advanced and expanded through the highly welcomed "The Composer in Cyber Residence" program - an international exchange effort where every month a different composer presents his/her opus via sound and vision. This Postersession will give an insight into the making of ARCANA and its features and services for the new music community and articulate future visions of ARCANA such as a VR listening space or virtual new music galleries.

Christine Tamblyn - Mistaken Identities: The Electronic Transference

"Mistaken Identities: The Electronic Transference" describes the technical and rhetorical strategies I employed in my recently completed CDROM ("Mistaken Identities"). The project bridges education, art and technology by combining aspects of a didactic presentation with ideas derived from several contemporary art media, such as performance, video, fiction and photography. The CDROM is organized around the lives and work of 10 famous women: Josephine Baker, Simone de Beauvoir, Catherine the Great, Colette, Marie Curie, Marlene Dietrich, Isadora Duncan, Frida Kahlo, Margaret Mead and Gertrude Stein. These figures were chosen for their emblematic status as female role models. However, the CDROM examines them as complex figures whose identities are not essential or fixed, but contingent and mutable. In representing them, I tried to subvert their commodification as icons by both the cultural establishment and feminism. As an alternative to this iconization, I configure their identities in the negotiated space between self and other, a negotiation that continues in my relation to them as narrator. The stories I tell demonstrate how each of these women derived her power from her ability to continually reinvent herself in response to the pressures and contradictions presented by her situation. "Mistaken Identities" constructs a genealogy around these women, observing the overlaps and parallels between their histories without undermining the specificities of each person's particular accommodation to the dilemma of how to be a woman. A genealogy differs from a biography in seeking to investigate the complex operations of power in social contexts. The project has six sections: the Portrait Gallery, the Timeline, the Scrapbook, TV Movies, Morphologies and Puzzles. The boundaries between fact, fiction and interpretation are intentionally blurred in the project. For example, TV Movies consists of clips from documentaries and Hollywood movies based on the women's lives. In the Scrapbook, quotations from the women's autobiographical writings are juxtaposed with snapshots that convey a sense of the texture of their daily existence. With its potential for facilitating periphrastic navigation, the CDROM format enables the invention of oblique narrative structures that mirror the circuitous strategies these women devised for organizing their lives.

Naoko Tosa, Ryohei Nakatsu - Mic and Muse

Why do people, regardless of age or gender, have an affinity for objects manifested in the human form? From the earthen figures of ancient times to mechanical dolls, teddy bears and robots, is it not true that man has conceived such objects in his imagination, then formed attachments and transferred emotions to them? We address the issues of communication and the esthetics of artificial life that possess this "human form" in modern society, both from artistic and engineering standpoints. As we create a virtual life that is nothing short of an artificial life, and communicate with this life itself, we have to ask where our future is leading us. An example is presented in which emotions are interpreted from human voices, and emotional

responses are triggered within the interactive setting of Maturing Neuro-Baby, "MIC & MUSE." "Neuro-Baby"(NB) is a communication tool with its own personality and character, including emotional modeling, such as reacting to changing voices, facial expressions and behavior. Based on the experiences of developing the early version of NB, we started the development of a revised version, "Maturing Neuro-Baby". The basic improvements in Maturing Neuro-Baby are the following. The Neuro-Baby character customizes itself to individual human communication partners by learning. Learning is achieved by Artificial Neural Networks(ANN) mapping from the input signal emotional state of the NB (recognition mapping), to an appropriate expression showing the response by the NB (expression mapping). "MIC" is a male child character. He has a cuteness that makes humans want to speak to him. MIC recognizes several emotions (joy, anger, surprise, sadness, disgust, teasing, fear) from the intonation of the human voice. People use a microphone when communicating with MIC. For example, if one whistles, MIC's feeling will be positive and he will respond with excitement. If the speaker's voice is low and strong, MIC will feel poorly and become angry. "MUSE" is a goddess. She is very expressive, has refined manners, is feminine, sensual, and erotic. MUSE's emotions are generated by a musical grammar. For example (joy --- rising musical scale, anger--- vigoroso, sadness --- volante, disgust--- discord, teasing--- scherzando, fear--- pesante) People can communicate with MUSE in an improvisational manner by means of a musical installation. From the standpoint of an artist, it is interactive art based on communication and on creatures that have a real ability to participate in an interactive process. Moreover, we think that by selecting a "human" - the creature with which we realistically communicate the most - we establish a condition that demands a creative character from a creature. From an engineering standpoint, we have come to the conclusion that if we want to create life-like characters, we have to develop non-verbal communication technologies. These are expected to give characters the capability of achieving heartfelt communication with humans by exchanging emotional messages. These life-like characters, or "androids", will unravel a new point of view in a new direction which allows the blending of art, computer science, psychology, and philosophy in a kind of novel research on realistic human expression.

Mark Tribe, Niko Waessche and Markus Weisbeck - Surf Design- Web Development in a Fluid Environment

Web designers have in the past mostly focused on their specific sites using an approach was strongly reminiscent to the handicrafts. The browser frame was the window through which designers examined their work. Today, designers face a set of complex challenges that go much further than this still very traditional approach. On the one hand, their level of technical expertise must rise as sites are created dynamically and are automatically patterned to changing individual user preferences. On the other hand, they must become aware of the changing economics of the Internet. They must consider the positioning of their sites in a network of links that are increasingly being dictated by advertising expenditures. Technology and economics are

now more relevant than ever to designers, who must step back from viewing specific sites as isolated entities and must see how the Internet functions as a fluid environment that encompasses dynamically changing user communities and changing patterns of user interactivity. In the beginning of 1996, it was sufficient to realize that a site had to constantly offer up-to-date information and fresh design in order to stimulate the surfer to interact with it. Content merged with design since web page appearance needed to reflect the type of content contained in it. Part of the web design process also involved the task of automating authoring procedures. In order to produce a constant flow of new information, authors used procedures like dynamically generated web pages and database connectivity. Thus, fresh, content-specific design and authoring ease were two important design considerations that could easily contradict each other but needed to be brought together somehow. Challenge enough, one would think. From the Summer of 1996, agent technology was integrated into more and more sites. User expectations were pushed even further. Then, not only the authors publishing process, but also the readers surfing process, could be automated. Readers let agents do the tedious Web surfing, demanding to view only the results. Design faced the difficult task of needing to visualize fluid information outputs. Web design has from that moment on permanently moved away from the handicraft stage. This does not mean that sites ceased being produced in this fashion. These sites, however, were increasingly branded as unprofessional and moved to the periphery. Behind the glamour of the major Internet sites, a cottage industry is working away quietly in the background, mostly in private households and universities. In this increasingly vast sea of information, it takes ever-greater economic and technological resources to make a visible splash. In the information space of the internet, proximity is not determined by location but by connectivity; sites that are well-linked loom large on the horizon of possibility. The result is a margin that is as rich and varied as it is invisible. Much of the most interesting Web work is still done here, but it is being noticed only by a small group of home users and rarely stumbled upon by chance. The reasons behind the formation of a periphery and a center are, of course, not only technological, they are primarily economic. The people behind the major sites are constantly asking themselves one question: how do I best embed myself in this fluid ocean of links? Money dictates position. There was a time in which Yahoo listed a whole range of alternative search engines- in the spirit of that horribly overused word: Netiquette. Now they list only one- Alta Vista. In this poster session we would like to present our work in Web design and content development, using it as an example to discuss the set of problems and opportunities outlined above.

Victoria Vesna: Bodies INCorporated

Bodies INCorporated, is a public space on the web (VRML/Java) that occasionally emerges in the physical realm. It will be exhibited from July 8 to August 11 at two network-linked sites -- The Contemporary Art Center (for a show entitled "The Bridge"), and The Ernest N. Morial Convention Center (for SIGGRAPH 96), both in New Orleans. After this, the show will be exhibited at the Santa

Barbara Museum of Art, and the San Francisco Art Institute. Initially, the participant is invited to construct a virtual body out of predefined body-parts, textures, and sounds, and gain membership to the larger body-owner community. The main elements of the online site are three constructed environments (subsidiaries of Bodies INCorporated), within which different sets of activities occur: "LIMBO INCorporated," a gray, rather non-descript zone, where information about inert bodies that have been put on hold -- bodies whose owners have abandoned or neglected them -- is accessed; "NECROPOLIS INCorporated," a richly textured, baroque atmosphere, where owners can either look at or choose how they wish their bodies to die; and "SHOWPLACE!!! INCorporated," where members can participate in discussion forums, view star/featured bodies of the week, bet in the deadpools, and enter "dead" or "alive" chat sessions. Events occurring within each of the zones ignite a range of emotional responses, and raise a variety of issues related to online community dynamics. For example, how does the graphic representation of the body amplify our relationship to it? What sort of psychological commitment and attachment do owners exhibit toward their "virtual" bodies? What happens when people find out that, with neither their knowledge nor participation, their body has been publicly altered in some way? How does the body become a source of pleasure and anxiety as it moves through changes and permutations out of the hands of the owner? What sort of emotional dynamics result from bodies being displayed as public spectacle? These are the types of questions Bodies INCorporated actively explores.

Bill Vorn and Louis-Philippe Demers: 10 Billion Robots: The Creation of Real Artificial Worlds

Through robotic installations, we pursue our researches on intelligent environments and life embodiment into matter. We regard machines as distinct entities from us, as much as we consider ourselves distinct from nature. Machines, through the ages, can be seen as an inner intermediate dialogue, in which they appear as the physical rendering of abstraction and also as our own comprehension of the structure of the world. First considered as the main intent of the human quest for its artificial double, machines now tend to become autonomous entities, leaning towards the behaviour of real living individuals. We do not intend to simulate nor physically reproduce real life animals but we rather deal with simplistic behaviors engendered by primitive mechanical animats. Shapes move from simple abstract objects (spheres, cylinders, sound, light) to kinetic and complex organisms as polymorphic patterns. We present robotic machines not as specialized and virtuoso automata but rather as expressive animated artworks. We also explore the reformulation of sound and light applications by simulating organic and metabolic functions and by creating dynamic virtual architectures. In addition to the intrinsic mechanical noise, loops and repetitive textures of both organic and metallic sound objects are part of the installations soundtracks, a collection of numerous heteroclit elements chosen for their evocative properties. The goal is to disfigure the inherent nature of the sound samples and to create a peculiar ambiance proper to the metaphoric habi-

tat of machines. Movement itself can be seen as the objective nature of the machine while its perception (from the viewer) as its subjective counterpart. The hyperreal simulacra of the robot world goes beyond the unreachable simulation of life on a computer screen. Robots are not only a virtual model, a pattern in space and time, but also a dynamic and avolving phenomenon embodied in matter. The replication of machine-organisms is a fundamental concept. Ecosystems are obviously based on population (gender and number) and their complexity is obtained from multiplicity of the inherent interactions. The perceived emergent behaviors of these machines produce a multiplicity of meanings based on single dynamic pattern of events. Real Artificial Worlds engender the paradox of simultaneous illusion and reality by a complete immersion of the viewer in a metaphorical but physically responsive environment.

Annette Weintraub: The Web as Intimate Space

While many regard the Web's strength as interactivity, and everyone acknowledges its vastness, one less recognized attribute of the Web is the quality of shared intimacy which provides a perfect environment for electronic narratives. As an artist creating work for the Web, I've become interested in creating work which uses the Web as an intimate storytelling space, and in the renegotiated relationship with audience that results. It's a paradox of much art on the Web that the seduction of images is the lure that attracts audience (and artists), yet the intimate connection forged by reading and interacting with a text on the Web may be the core of the online experience. This unique fusion of text and image in a dynamic medium with a mass audience provided a particular challenge. My presentation examines the genesis of my Web-specific work ("Realmsm," at <http://artnetweb.com/projects/realms/notes.html>, and "It's Pedestrian" which is in development) and my ideas about the development of a text-based visual narrative. When I began my first work for the Web, "Realms," I started with a vision of images accompanied by short narrative phrases. As I worked, the narrative took over, and the balance of the piece began to shift to become a narrative with images. I was struck by the power of text on the web, and felt the extraordinary intimacy between artist and audience. I began to develop what writers call "a voice", and to design the piece as a very direct juxtaposition of deceptively simple, short texts paired with a background image. Each episode in "Realms" was designed to be complete on one page, and the texts were designed to play with or against the images in an unexpected way. The tempo of the piece, and its pacing, began to be determined by the speed of absorbing text, as well as by the speed of download over the Web. And the imaginary viewer became a tangible presence in the work. I found myself thinking intensely about storytelling, dramatic structure and the viewer/reader relationship. Several concerns emerged: the special qualities of the audience and the audience-artist relationship (a broad-based rather than art audience); problems of timing and attention span (notoriously short on the Web); the possibilities for communication with the reader/spectator/participant; the choice between direct and abstract communication (in consideration of the broader and more accidental

audience); and alterations in the theatrical model of attraction, development and resolution to fit the more sporadic and randomized space of the Web. From my perspective, Web-based art work is a largely theatrical and story-based medium with the potential for creating unique dramatic narratives of text and image and for reaching a diverse and engaged audience. My presentation will focus on this perspective, using the evolution of "Realms" and "It's Pedestrian" to illustrate the process, and will examine these intersections of text and image, the development of a storytelling space, and the challenge of creating an richer and more complex relationship between artist and audience.

Léon Wennekes: TIME for a better understanding, a better education & more fun

Everyone who ever saw the film 'The Time Machine' from H.G Wells, knows the scene where Rod Taylor sits in his machine and looks in the window of a womens fashion shop. Because he is travelling through time you see the dressed puppets in the windows rapidly changing clothes. A change of fashion during years can be seen in one minute! This method of time-lapse creates a special feeling and notion of time. You see something that you probably never would see in your life-time and it creates a special knowledge. I strongly belief that the 'new visual language' everyone is talking about, will be one where time will play a more important role than we think of now. In VR products because people can virtually travel through time-related databases e.g. seeing how things evolve in time (the growing of plants in a timeframe while you walk around in the forest in real time!). In interactive products the 'real time' can be used to literally design the user interface people look at. To give an example. When you start-up the Albert Heijn TeleCD-i (of which I was the designer and art-director.) TeleCD-i made it possible to buy grocery goods at home and have them delivered, it depends on the time (the internal clock in the CD-i player) what you hear and see. In the evening you have another background and more easy-listening music than during the daytime, (this was only implemented in the main menu). Currently I am working on more examples of 'designing with time'. One of them is a CD-ROM where time will be one of the major factors influencing virtually every aspect of the surroundings, buildings and events the users 'walk' in. Subject of this postersession will be the following statements / items: - the use of 'time' for knowledge is an underdevelopped subject - Time can be divided in 'subjective time' and 'objective time' - Time can be a tricker to introduce new situations and surroundings - Time will be a navigation tool in interactive and VR productions of the future (time machines as navigation tools)

Nik Williams and Henri Lowengard- Cybergomi; Here, Today, Tomorrow

The protean nature of the computer is such that it can act like a machine or like a language to be shaped and exploited. It is a medium that can dynamically simulate the details of any other medium, including media that cannot

exist physically. It is not a tool, although it can act like many tools. It is the first metamedium, and as such it has degrees of freedom for representation and expression never before encountered.....[Alan Kay, 1984]

Computer software can of course simulate other, more traditional media. However, considered as a medium, computer software can also do many new things: it can interact with users in relatively arbitrary ways; it can simulate other processes; and perhaps most importantly, it can adapt. Unfortunately, as commonly implemented, computer software is not a very good communications medium. It is relatively cumbersome to distribute software, there are too many incompatible platforms that can only 'display' very specific forms of it, it has very little structure, and it is relatively difficult to create "content" that exploits its full interactive potential. Also, software can be a dangerous medium. "Display" of the "content" in this medium (the execution of computer software) can actually cause damage to the property of the reader through theft or destruction of information.

The internet/web is a bubbling primordial soup of opportunity and change. It is also a poorly developed and largely misunderstood rat's nest of incompatibilities, platform incongruities, brain bending hacks and glossed over problems waiting to be solved by ruthless corporate megalabs willing to spend whatever it takes to dominate the nature of art and art in life into next millennium. Many "cyberonauts" jumped into this broken tornado bright eyed, open hearted and flush with ideas waiting to be loosed on a receptive, like-minded world.

I want to peel away some misconceptions regarding the capacity of the net to deliver dreams in tact while opening a dialogue and demonstration on how to good stuff done. Suffer not the slings and arrows of outrageous Fortune 500 companies. Understand a little more about how tools are made, what art requires of all of us and put aside the notion that 18 hour days make you a better anything.

INSTITUTIONAL PRESENTATIONS

Jose Ramon Alcalá - MUSEO INTERNACIONAL DE ELECTROGRAFIA UNIVERSITY OF CASTILLA-LA MANCHA CUENCA (SPAIN)

HISTORY In May 1990, the Rector of the University of Castilla-La Mancha inaugurated a center for research into new electronic media technologies located in a restored 18th century Carmelite Convent building. The center's primary objective is to conserve, display and acquire an international collection of artist's work who utilize machines and processes related to new technologies, for the generation, reproduction and printing of images. In January 1991, the Museum incorporated an electronic media technology laboratory into its working structure, to carry out theoretical and practical research into applications of the field of artistic creation. Some months later a documentation center, with a small specialized library; and the Center for Image Research was established, designed to provide additional support for the new media workshop in the field of graphic design, corporate image and creative advertising. Five years after its inauguration, the Museo Internacional de Electrografía is a dynamic museum; an art center with very specialized, unique lines of research, and though on a restricted budget, fulfills its five primary objectives: *research: by creating an international artist-in-residence program that invites artists from all over the world to collaborate with the MIDE on their current research projects, with technical support and guidance from the University of Castilla-La Mancha and the Ministry of Education and Science; *dissemination: by holding exhibitions, offering a documentation and media information centre, publishing...; *conservation: creating an active, dynamic collection of current works of art which are appropriate examples for displaying the latest national and international artistic applications of new image technologies; *education: for artists, students and the curious, offering specialized courses and seminars (including programs of awards and fellowships for researchers, technical assistants and workshop assistants); and *collaboration: by offering financial assistance for Research projects, providing MIDE equipment and in the broadest sense, making MIDE's resources available to artists and researchers who wish to develop specific projects and activities. Some of the ways that this can happen is by MIDE contributing technical expertise, and offering financial assistance for research and interesting artistic proposals in diverse areas of Research which falls within the specific realm of the MIDE. **AREAS OF RESEARCH** The Museo Internacional de Electrografía-EDA in Cuenca has the following, clearly defined, areas for research currently open: * Digital image techniques and processes using new electronic media technologies. * The contribution made by these digital technologies incorporating traditional processes of

printing and reproduction. * Creative techniques and processes of graphic telecommunication technologies. (Fax-Art, Internet, real-time teletransmission etc.). * Interactive multimedia, Computer Art and Postproduction of the dynamic image on digital video. * Educational philosophies that the new image technologies can generate. * New museum models for contemporary art in the data transmission era. The would include possibilities of the virtual museum.

Alexander S. Belonenko - The Electronic Music School in St. Petersburg.

The Hattoyama tiro Electronics, Acoustics and Music School Studio attached to the Rimsky-Korsakoff Conservatory of St. Petersburg was opened in 1993 on the basis of the Conservatoire Laboratory of Electronic and Computer Music. Its main task is promotion and development of creative, scholarly and educational activities in the field of electronic and computer music, including training of specialists in composition and musicology coping with electronic and computer technologies. An essential part of the School Studio equipment constitutes the collection of Yamaha produced electronic creative contacts with the Prometheus Research Institute in Kazan (Russian Federation), the Sheffield Hallam University (Great Britain) and the IRCAM Institute in Paris (France). During the years passed, the work of considerable importance in research, creative and pedagogical directions has been done by the School Studio, largely enough with the contribution of the St. Petersburg Conservatoire students and the pupils of the Glinka Choral College attached to the St. Petersburg Academic Singing Capella. Some results of this work, including students' experimental compositions and electronic music transcriptions, were demonstrated in 1994-95 at the research and practical conferences (several international conferences among them) in Moscow, Kazan and St. Petersburg. In 1995, the School Studio, together with the New Music Ensemble of the St. Petersburg Conservatoire, took part in a concert program at the 4th. St. Petersburg Easter festival. The School Studio systematically organizes open musical sessions devoted to the outstanding electronic and computer music compositions and to the creative work of the eminent composers of the second half of the XX century. The plans of the School Studio for 1996 include arranging of a research and practical conference devoted to the centenary of Lev Theremin and participation in other jubilee actions celebrating this date.

XAVIER BERENGUER: INSTITUT UNIVERSITARI DE L'AUDIOVISUAL UNIVERSITAT POMPEU, FABRA

The Institut Universitari de l'Audiovisual of the Universitat Pompeu Fabra (IUA-UPF) is an institute devoted to images and music by means of electronics and computers. It was established at 1994 as part of the UPF Audiovisual Complex that comprises the Faculty on Audiovisual Communication, a Media Centre, two auditoria and other facilities. IUA-UPF acts in the fields of Education, Production and Research. It offers several Doctorate stu-

dies (attached to the Faculty of Audiovisual Studies of the UPF) and two masters (Audiovisual Creation and Technologies (EMMA) and Music Creation and Technologies). IUA-UPF has produced interactive programmes (Twelve senses: Catalan Poetry; Born, magazine for audiovisual communication); music pieces (over 20), animations and videos (about 15). Every year several grants for experimental production are offered to students and professionals. In the Research area, IUA-UPF is working on Sound analysis, transformation and synthesis; Interactive systems (concept and design); Generative Art; and Virtual Environments. With respect art on line, and together with the Museum for Contemporary Art of Barcelona (MACBA), IUA-UPF has started a production/research team called "MACBA-on-line". Finally, IUA-UPF is present in the Barcelona cultural landscape: every month organises the Sala HAL, a place for exhibitions and lectures on audiovisual and new millennium. The presentation at ISEA96 will explain some details of the IUA-UPF two year experience and will show some of its results.

Paul Boneventura: The Laboratory at the Ruskin School of Drawing and Fine Art

The Laboratory is the name of a new unit at the Ruskin School of Drawing and Fine Art which was founded in 1994 to foster and promote new work in the visual arts. The Laboratory provides opportunities within the University of Oxford for professional artists at graduate level and beyond to continue with and expand upon their existing activities, creating a forum for informed debate on current practice and furnishing a platform for the exchange of ideas and information on a wide range of artistic issues. It promotes collaboration between artists and experts from the worlds of science, technology and the humanities and seeks to generate an arena within the framework of the University in which practitioners can engage in meaningful critical dialogue across a number of academic fields.

Visible output from The Laboratory takes the form of exhibitions, public art projects, limited editions and multiples, broadcasting, live and time-based art and publications in electronic and paper-based formats. The exhibitions and other projects occur both in and out of Oxford and form the basis of various symposia on a wide range of topics.

Shawn Decker - Art and Technology studies, School of the Art Institute of Chicago

The art and Technology Studies Program at the School of the Art Institute of Chicago is one of the largest and most comprehensive of its kind in the United States. This interdisciplinary program includes a wide range of electronic, mechanical and computer-based areas of study including computer imaging, digital video, interactive media, computer animation, holography, digital sound and music, electronic media-based installation, telecommunication art, neon, kinetics, electronics, microprocessor and computer programming, and algorithmic composition. Recently, the department has reworked its curriculum with a goal of including more cross-disciplinary advanced courses, as

well as a team-taught introductory sequence which provides abroad yet complete foundation for further study within the department. A general overview of the department as well as this new curriculum will be presented

Tessa Elliott - Programming, Education and Fine Art Practice

The pick and mix, cut and paste provision of commercially available software packages can be compared to the supply of ready-to-wear outfits and accessories. In both cases the user will find that the merchandise does the job. But no matter how much careful mixing and matching takes place, there should be no illusion, this is neither Fine Art nor haute couture. It therefore follows that instruction in the use of software packages simply is not enough if artists are to work creatively with computer technology. Submerged into a 'culture of silence' - that of the end-user, with little or no understanding and control over the metaphors of software and the conventions of others, artists become the oppressed.

CONTROL, SHIFT, ESCAPE * is the current antidote for artists and designers united by their desire to change the status quo - by taking control of the technology, shifting from end-users to instigators, escaping from the dictates of pre-written software to create their own conventions. The degree show is the culmination of 1 year intense study on the MA Digital Arts* course at the Centre for Electronic Arts, Middlesex University. By a focus on the algorithmic use of computers in the representation of form, the MA demystifies the concepts underlying the digital medium and critically examines issues arising from the convergence of the arts and new technology. Throughout the course students use a range of the latest technologies, including Java, html and C programming to find a personal language to explore their concerns. Their video, robotic and sound installations, Web-based work, screen-based games, photographic prints, reactive and interactive systems challenge the look, feel and content imposed by commercial computer software. The orchestration of artistic intuition and logical structures results in the creation of new computer-mediated spaces for computer-contaminated cultures.

James K-M: Vancouver Film School Multimedia 'The Multimedia Learning Experience'

The Vancouver Film School Multimedia is currently the only cross-platform multimedia production training facility in North America dedicated exclusively to multimedia training. The VFS Multimedia facility officially opened in June 1995 and is a fully integrated environment where advanced hardware and software technology are housed in a configuration of specialty labs and presentation venues. The facility is open 24 hours per day providing students with almost unlimited access to equipment. The program recognizes various skill levels and backgrounds by providing a Core Program (compulsory) and series of Advanced Classes. The Core Program follows the production process and students begin assembling elements and acquiring skills that evolve and culminate in an electronic interactive production of personal and group projects which are mastered on pre-selected digital format and publicly presented

in the VFS multimedia presentation gallery/theater. Students applying for this program should be highly motivated, entrepreneurial, artistic, have good communication skills, a strong commitment to hard work and ability to work independently and in teams. The ISEA'96 presentation will include the best work produced by students at VFS Multimedia during the past year, including examples of video, audio, animation, interface design and graphics. Please check out our Web site at <http://www.multimedia.edu/>. James K-M Vancouver Film School Multimedia 420 Homer Street Vancouver, B.C. Canada V6B 2V5 (604) 685-6331 x112 Fax:(604) 685-6321 jameskm@griffin.multimedia.edu <http://www.multimedia.edu/>

Peter Lunenfeld: Dynamic Aesthetics for Dynamic Media: The Graduate Program in Communication & New Media Design at the Art Center College of Design, Pasadena.

Digital tools and media demand a dynamic aesthetic to replace the static model. Contemporary graphic designers must plan for movement, must anticipate interaction, must understand narrative. As publishers merge with television studios, and magazines create integrated web sites, convergence is more than just a catch phrase. The designer must be able to move from print work to dynamic media, from two dimensions to three, and sometimes even four. Design's contribution to meaning has never been greater. It was for this reason that the Art Center College of Design instituted the Graduate Program in Communication & New Media Design. Educational institutions must speak to each other and discuss how they are responding to the onslaught of technology and the new paradigms in art and design. Our presentation will focus on three issues: (1) curricular modeling; (2) the importance of a theoretical underpinning for studio work in new media; (3) integrating entrepreneurialism into design education. We will be showing selections of student work in print, interactive media, and the World Wide Web. We feel that response to our presentations in European contexts have been quite strong, as demonstrated in last year's 101 Design Conference at the Van Eyck Akademie and at Doors 3 in Amsterdam. What follows is an expansion of the three main areas to be covered: (1) We will discuss how we built on Art Center's renowned design curriculum, adding technical classes that span the range of tool sets necessary to create fully formed projects in the new media, with studio courses in programming, interactive design, motion graphics, 3-D modeling, digital font design, and web site development. (2) Equally important, we will cover the seminars that create an intellectual context for these technical skills. These seminars include theories of construction, new media aesthetics, semiotic discourse, interactive narrative and classical story structure, the philosophical implications of virtual systems, and the interweaving of architecture and imaging systems. (3) Part of increasing the significance of the designer's role in the coming information era is to increase the designer's ability to generate projects, to create intellectual capital and utilize it, rather than coming in at the end as a surface treatment. Art Center prepares its students for just such an environment by encouraging an ent-

repreneurial approach to design, exposing students to other models of intellectual property systems -- the film industry prime among these -- in which creators have been able to wrest certain degrees of autonomy, control, and equally important, equity in the projects towards which they contribute.

Elizabeth O'Grady - Building a house on sand?: Is the digital world sufficiently solid to be a new foundation for artists?

Inter/@ccess is a non-profit artist-run centre, founded in 1983, which provides a community network and resource base to enable artists and the public to explore the intersections of culture and technology through the creation, exhibition, presentation and discussion of electronic art forms and new communications media. Located in Toronto, Inter/@ccess operates a bbs about electronic art, and offers access to computers to artists working in digital media, in addition to presenting events and exhibitions of electronic art. We also provide an on-going context for critical discourse, and present alternative views of the use of new technologies to those provided by the mainstream media and government policy-makers. The evolution of the centre illustrates recent developments in many interwoven wider spheres. Globalization has caused contempt for anything which does not contribute directly to the bottom line, while dwindling government funding for arts is reviled as philistinism by some, and hailed as a return to the good old days of elitism and artists' patrons by others. At the same time, corporate sponsors are refusing the traditional "arm's-length relationship" and demanding more decision-making power in exchange for their funding. CD-ROM manufacturers are eager to get their hands on cool multimedia content to move their products off the shelves, but few artists in this situation have creative control over their work. The potentials for electronic art creation are expanding constantly with the increased sophistication of hardware and software; however, this means even steeper learning curves for the electronic artist. In addition, rapid obsolescence makes it unfeasible to invest heavily in equipment. Computer Inter/@ccess has tried to respond to, maybe even take advantage of, these fundamental changes. One of our goals is to make this a place for the entire electronic media arts community of Toronto and beyond, to offer something for emerging artists, senior electronic artists, critics, students, and the public. Most policies of our organization have been re-thought: membership, the computer studio, the bbs, exhibitions and events, staffing. Is it possible to define a stable place for ourselves in this digital rush hour? What should be the position of the artist-run electronic media arts centre? What is the role of the creative artist in the digital world?

Stephen Partridge - School of television & Imaging, Duncan Of Jordanstone College of Art, The University Of Dundee Scotland

The School is recognized as a leading European provider of postgraduate education and training in creative electronic imaging through its established programmes: the PGDip in Electronic Imaging; Short Courses for free-lance TV professionals; and its production and research wing, The Television Workshop. In September 1994 two new undergraduate pathways - the BA (Hons) Fine Art (Time Based Art), and B Des (Hons) Design (Animation & Electronic Media) - were established in partnership with the Schools of Fine Art & design, extending the scope of the Schools of Fine Art & Design, extending the scope of the School and the opportunity for students to study and practice our specialisms from undergraduate through to postgraduate level and beyond.

Hasnul J Saidon and Azlin Rahman:
UNIMAS c.r.e.a.t.e.s - Computer-Related Experiments in Art & Technology Studio

Section 1 : The 'Real Space'

Upon general observation, the highly negated space that defines Malaysian artscene is strongly marked by a common chasm between commercial imperatives (that promise financial return) and the need to express genuine, relevant and innovative ideas (that may promise possible disappearance from the local artscene or space). An overview of this space will be the initial focus of the presentation. Major characteristics of the space as well as the defining regional, national and local factors will occupy most of this section. Other than outlining the scenario that leads to the formation of the studios, this section will also include the university's vision and mission, philosophy, and approach.

Section 2 : The Alternative 'Digital Space'

This is where the main focus will be given to the Studio's interest in providing alternative digital space to nurture the spirit of experimentation. The Studio, which is placed under the roof of the Faculty of Creative & Applied Arts, has taken a full commitment in setting-up a highly-equipped I.T.-based (Information Technology) environment for its' arts programs. The Studio offers courses that compliment the Faculty's integrated approach toward creative arts, technology and management. Model curriculum that meets the immediate national and regional demands for I.T-literate artists and designers will also be presented together with the challenges and issues related to the design of electronic/digital-based art courses. Samples of students' work will be included.

Section 3 : The Studio Set-Up

This section will focus upon the physical and digital structure of the existing studio (and the future upgrade / expansion). Various available platforms or workstations as well as applications (softwares) and the supporting equipment will also be presented. This section will also present the operational structure of the studios which is inclusive of the studio's roles in providing academic services, engaging in professional projects and consultation, establishing a communication and networking base, formation of a digital resource centre and providing production support to the rest of the University. Samples of the Studio's portfolio will

be presented.

Section 4 : The Future

This section will outline the Studio's future planning and operational action-plan.

Leonello Tarabella: Computer Music CNUCE/CNR, Pisa

The CNUCE Institute, founded in 1965 and attached to the National Council of Research, has a staff of more than 120 active in the departments of logic programming, computer network, satellite flight control, data bases, parallel computing, structural engineering, remote sensing, computer graphics and computer music.

The activities at the Computer Music Department of CNUCE/CNR - Pisa mainly consist of Applied Research, Education, Music production and Organization of concerts and special events: - applied Research involves the design and the implementation of original hardware and software tools to be used in interactive live performances; - a course on Computer Music is yearly taught at the Computer Science Dept. of Pisa University; - a special summer school is yearly organized together with the Music Dept. of the New York University including workshops and live-interactive computer music and computer graphics events. Interaction is the keyword that characterizes the activity of the Computer Music Department of CNUCE: a Workshop on Man-Machine Interaction in Live Performance took place in Pisa in 1991 and reported in *Interface, Journal of New Music Research* n.22, 1993.

In order to put at work the power of the algorithmic composition approach, a special language called Real-Time Concurrent PascalMusic (RTCPM) has been developed: a peculiarity of RTCPM is the possibility of defining the composition in terms of many procedures running at the same time and interacting with the program/composition during the execution; this is obtained by selectively sensing actions performed on external devices and making decisions on the basis of human performers gesture. Sensors typically used in robotics are taken into consideration for developing original devices: infra-red beams (IR), CCD cameras for video capture and image processing (IP). The basic idea consists of carrying out special devices for remote sensing (i.e. without mechanical and/or electrical links) moving objects handled by performers or gesture of the human body (dancers, painters, etc..) to be used in interactive computer music/graphics live-performances. The most relevant devices developed at the Computer Music Dept. of CNUCE are: the TwinTowers device (IR) which detects positions and gesture of the hands so implementing a sort of two aerial tri-dimensional joy-sticks; the Light Baton system (IP) which detects the movements of an orchestra conductor for controlling virtual ensembles of performers; the Aerial-Painting-Hands system (IP) which detects positions and movements of a painter's hands in live interactive computer graphics/music performances; the UV-stick system (IP) i.e. a UV-lamp lighted straight stick whose 3-d position and 3-d rotation are recognized; the Imaginary Piano system (IP), where the hands of a performer play in the air with no real keyboard. Following a tradition of the department in developing sound machines, special DSP based boards for realtime signal synthesis and

processing have been carried out; besides, a special graphic-editor for DSP algorithms has been implemented. The Computer Music Department of CNUCE promoted, and is deeply involved in, the realization of the ESPRIT project CATS (Computer Aided Theatrical Score) for theatre and cinema direction simulation (also called the multimedia script). The staff of the Computer Music Department of CNUCE (Leonello Tarabella, Graziano Bertini, Alfonso Belfiore, Paolo Carosi, Giuseppe Scapellato, Massimo Magrini, Mauro Lupone, Giovanni Chiparo, Marco Cardini) consists of people specialized and graduated in the various work-areas: computer science, music, visual arts, drama.

Katerina Thomadaki and Maria Klonaris - A.S.T.A.R.T.I.

International Triennial on Art and Technology and the third event will take place in 1997 in Paris.

Founded in Paris in 1985 by the artists Katerina Thomadaki and Maria Klonaris, A.S.T.A.R.T.I. develops an interdisciplinary international project on media arts: film, video, computer art, multimedia performance and installation, 3D animation, virtual reality, interactive environments, communication networks, etc. Since 1985 A.S.T.A.R.T.I. has organized numerous events (exhibitions, projections, conferences and symposia) in France and abroad and presented innovative work by more than 300 international artists. In 1990 A.S.T.A.R.T.I. has premiered the International Conference on Media Arts (Rencontres Art cinema/video/ordinateur) at the Videotheque de Paris, with the participation of more than 20 international partner-institutions and private companies, alternative and independent associations, etc. The first "Rencontres" has focused on the relationships between technology and imaginary and has proposed the breaking down of barriers between the different technologies of the animated image, thus questioning the new discriminative phenomena linked to the use of different media in the arts. The event crossed theories and practices, projections and debates: it was composed of more than 30 thematic programs and 8 panels in which participated artists, philosophers, art historians, curators, institutional responsables and industrials. A book was published as a catalogue of the event: "Technologies et Imaginaires", edited by Katerina Thomadaki and Maria Klonaris, Dis/voir, Paris 1990.

Organized in 1994 at the Videotheque de Paris, the second International "Rencontres" on media arts, entitled "Image Mutations", has questioned the impact of image mutations on our cultural environment. Proceeding beyond the fascination connected with the advent of electronic and digital technologies, the second "Rencontres" has proposed a space of creative criticism and comparative analysis. Connecting lines have been drawn from early cinematic or pre-cinematic phenomena to abstract computer animations, digital effects, stereoscopic video, virtual reality. Some 150 artists and theorists from 20 countries have participated in the event, along with 25 international partners. A wide range of questions has been raised: not only aesthetic and technical, but also philosophical and social, like for instance: "What do the technological arts reflect of the political, social and cultural upheavals at present affecting Europe and the world?". The book accompanying the second event is "Mutations de l'image" edited by Katerina Thomadaki and Maria Klonaris, A.S.T.A.R.T.I., Paris 1994. The second "Rencontres" has been prize winning at the Kaleidoscope programme of the European Communities Commission. The "Rencontres" is now developing into a

WORKSHOPS & TUTORIALS

Josepha Haveman - 3 Half day tutorials

Tutorial (1)

Computers and Art: An introductory tutorial overview for artists who are new to digital media and technology. Overview of basic computer system components, relationship of specific functions to the special requirements of different types of graphics. Outlines certain principles that are pertinent to creating 'computer art'. (Macintosh oriented, applicable to other systems)

Tutorial (2)

Image processing; for professional artists and photographers. Introduction to the practical uses of Adobe's PhotoShop and similar applications for 'improving' photographs and other digitized images. This tutorial provides guidelines for computer editing of visual materials. (Macintosh, though applicable to most platforms)

Tutorial (3)

Image processing; creative potentials and aesthetics of digitally 'enhanced' graphics. Digital methods for altering the expression and content of photographs and other pictures. How to modify meaning by changing color, contrast, mood, composition and other means to strengthen the artistic effect of an image. (Macintosh, though applicable to most platforms)

Mari Kimura - Virtual Soundscape

A violinist/composer Mari Kimura will give the lecture/demonstration on 9/16, using Zeta MIDI violin and interactive computer system. She will demonstrate the integration between live performer and technology, and discuss the issues and perspectives for the future.

The Netherlands Design Institute, Judith Donath, Victoria Vesna, Nik Williams - Websites as Project Tools

Judith Donath

A website is a virtual neighborhood. It is an information space that gathers people with common concerns and interests, or in the case of a project, a common task to accomplish. Certainly a website can be a repository of information, a fast efficient method for international publication. Yet a website can be much more: it can evolve as it is used and it can be a center of activity and communication. My focus in this workshop will be on the social aspects of designing websites as project tools. How do the participants get to know each other? How can they see the pat-

terns of opinion and interests that demarcate their roles and affiliations? Understanding the social forces - how the participants perceive each other and how they feel they are themselves seen - is essential in designing environments that encourage participation and cooperation, environments which function as project tools.

Victoria Vesna

We will examine and critique a number of existing web sites, working towards a deeper understanding of the impact of visual representation, anonymity, pseudonymity, ephemerality, etc. on the social norms that evolve within the site. The web is a communal, collaborative public space - how do we contribute to this environment without uploading yet another static documentary of work? What kind of effect does existing software, and the speed with which we access resources, have on the interaction and aesthetic of web-based projects? What happens to work that attempts to bring the web into physical public spaces? In what ways do online works need to be modified when taken offline? How might the space work is experienced in influence audience interaction, and how may web projects reinforce local community relations? In this workshop, I will give a conceptual overview of available web technologies, and how they are being un/successfully used in both on and offline projects. I will address the aesthetics of navigation and interactivity in effort to illustrate how one prepares for using the web as the primary location of a project, as well as a secondary site to projects that exist outside of networks. We will view and critique works that reside solely on the web, as well as projects done with other media that have a web component as part of their concept. Our discussion will also focus on the changing relationship between artist/audience, and how this transformation effects both on and offline spaces. By placing our discussion in a larger historical framework of artists working outside the confines of institutions, we will discuss the implication of the web on public exhibition/interaction processes.

Nik Williams

The internet is a primordial soup of opportunity and change comprised of competing protocols, platforms, hacks and cracks. Beyond its physical structure, the internet speaks to our deeply rooted desire as a species to extend its capacity to communicate intimately across an ever widening venue. This an egalitarian, universal quest which is tempered increasingly by the local laws of supply and demand. No matter how you feel about the socio-political ramifications of so called "market driven" problem solving, the fact is that the structure of the internet is shaped by economic interests willing to spend whatever it takes to dominate and/or facilitate the nature of art and popular culture in the next millennium. Many "cybernauts" jumped on this helter skelter bandwagon bright-eyed, open-hearted and flush with ideas waiting to be loosed on a receptive, like-minded world. Some have been buoyed by success, others are less enthusiastic. Will we generate the requirements for sustainable, intelligent life on the net or will the forces of greed and corporate entropy pull the evolution of what some have called the greatest democratic tool ever created into the black hole of mediocrity? Taking the state of the network as a given is not unlike the reaction of a patient who is diagnosed with a serious illness. It

might be bad news but thank heaven one has insurance. I hope to encourage the examination of some root misconceptions regarding the capacity of the net to deliver dreams in tact and to discuss issues which will effect the quality of life our network communities might hope to achieve. Suffer not the slings and arrows of outrageous Fortune 500 companies. Understand a little more about how tools are made, what art requires of all of us and put aside the notion that 18 hour days make you a better anything.

Real-Time Audio Morphing © Zack Settel and Cort Lippe

As a sound processing technique, Audio Morphing has existed for many years. However, with the recent increases in computing power this technique has become available in real time for musicians (non-engineers), providing them with an opportunity to explore unusual sound processing algorithms empirically, while offering additional signal processing choices for live performance situations. The authors have developed a real-time Audio Morphing application on the IRCAM Signal Processing Workstation (ISPW). The application features an intuitive and straightforward user interface, and is intended for musicians (sound designers etc.). The application's signal processing algorithms make use of Fast Fourier Transform-based resynthesis (FFT, IFFT), and provide for high quality time-stretching, filtering, dynamic range processing, spectral shaping, cross-synthesis, and spatialization. These techniques allow users to project various features of one sound onto those of another, thus creating a new sound or "morph" which resembles the original sound--often in unexpected ways. This workshop is intended to provide participants with information and experience in Audio Morphing. The authors will present an overview of the technique and its applications, explaining the basic concepts in terms familiar to non-engineers with some studio experience. During the workshop the participants will have an opportunity to explore the techniques mentioned above, creating "audio morphs" of provided sound examples while following the tutorials developed by the authors. Just as morphing tore through the video world, audio-morphing has given electronic musicians and composers just as much to consider. This workshop given by prominent electronic musicians Zack Settel and Cort Lippe, begins to unravel the mysterious nature of this new technology in REAL-TIME. Given in two half-day sessions.

Stephen Wilson - Advanced Web Authoring

Advanced Authoring for the World Wide Web : This workshop will prepare participants to work with advanced features of the World Wide Web. It will show attendees how to work with inline and external images, sound, digital video P covering such topics as preparation of correct file formats, design decisions comparing inline vs external images, and working within web limitations such as html and variations in user configurations of browsers. It will also show attendees how to author interactive imagemaps and interactive forms including an introduction to Javascript that is neces-

sary to make them work. The workshop is based on the presenter's book *Web Design Guide* (Hayden, 1995). This intermediate to advanced level workshop will present extended techniques for Web page design. Discussed will be advanced image and sound processing techniques, and their integration into the Web page as a whole.

Introduction to 3-D computer Animation © Michael O'Rourke

Three dimensional animation is rapidly becoming the medium of choice for artistic expression in the 90's. Whereas 3-D was formerly available only to those with access to the most powerful and expensive supercomputers. However as faster and less costly processors become available, 3-D comes closer in reach of the general artistic community. To this end, ISEA96 will present a introductory workshop by the well-known animator Michael O'Rourke. The workshop, presented in cooperation with Intergraph Corporation and SoftImage will explore the fundamental principles behind 3-D, as well as the possibilities offered by the WindowsNT operating system and Intergraph's new multi-processor graphics workstations. The workshop will be in two sessions: a morning tutorial and an afternoon hands-on workshop. The tutorials will consist of a half day of lectures, slides and video demonstrations on the principles which underlie 3D computer animation. Attention will be paid to modeling concepts, rendering concepts, basic & advanced animation techniques, compositing techniques and recording. The workshop will consist of demonstrations and hands-on exercises. The bulk of the time will be spent with the participants actually working, in small groups, at their workstations.

Tutorials Computers and Art / Image Processing I / Image processing Joseph Haveman

Computers and Art: An introductory tutorial overview for artists who are new to digital media and technology. Overview of basic computer system components, relationship of specific functions to the special requirements of different types of graphics. Outlines certain principles that are pertinent to creating 'computer art'. (Macintosh oriented, applicable to other systems) **Image processing;** for professional artists and photographers. Introduction to the practical uses of Adobe's PhotoShop and similar applications for 'improving' photographs and other digitized images. This tutorial provides guidelines for computer editing of visual materials. (Macintosh, though applicable to most platforms) **Image processing;** creative potentials and aesthetics of digitally 'enhanced' graphics. Digital methods for altering the expression and content of photographs and other pictures. How to modify meaning by changing color, contrast, mood, composition and other means to strengthen the artistic effect of an image. (Macintosh, though applicable to most platforms)

ELECTRONIC THEATER

Performance Practice of Computer Music © Mari Kimura

In this hands-on workshop, violinist Mari Kimura will illustrate the unique uses of the Zeta MIDI violin and its implications for electronic music.

David Apikian - Dream

Brief attempt to show and make visible dreams. Materials present in this sequence: liquids, water, mercury, exchanging their matter, formspheres, drops, tunnels, are the symbols created by the subconscious for a visual expression of archetypal ideas. Those archetypes are found in all civilisations, all cultures, throughout the ages. The application of computer graphics has been for me the occasion to use my previous studies and experience while synthesizing them together. I think, you can forget about material constraints and consequently be freer in expression and creation with computers. For me, the computer represents the whole human scientific and spiritual experience so that it is a universal "tool" for the artist.

Beriou - Limbes

Limbes ten or so sequences supported by a narration tells the memories of a baby in the womb. The film begins like science fiction. But as evidence mounts, we realize that the birth is imminent, and it becomes clear that the narrator is a human being in gestation. This story of initiation invites us -through virtuality- to reflect upon the concept of materialization the process by which things take form. And what if... matter did not exist...and what if the world and the objects we know were just a fine film, with no thickness to it...infinitely folded it on itself a fractal, thereby creating the illusion of mass? And what if...the inside and the outside had no consistency...and what if all matter were nothing but this remarkably deformable envelope sometimes touched by a breath...fashioning the appearance of a being, with an inside and an outside...then the other way round? And what if...being born meant creating a new fold...making it swell untill it formed a bubble...tore the wall and escaped...leaving the mark of a navel? And what if...dying meant delving once more into the folds of this huge sheet of flesh? And what if...life were just a stage curtain, and the actor just the wind ruffling the curtain?

Christian Boustani - Cities Of The Past - Bruges

Bruges, in the Middle Ages the Venice of the north, locked between land and sea and beset by the misfortune of time. Plagued by natural disasters and the calamities that lie its heart and faced with decline, the city struggles towards its Renaissance... In the heart of that city works a painter, an inspired alchemist in search of new materials. There he mixes his breath with oil and pigments, conden-

ses color and light, transparency and solidity. The secret of oil painting he discovers will offer immortality to his city.

This film shows us the middle ages as seen through the imaginative eyes of the Flemish masters and does not restrict itself to a faithful reconstruction of historical fact. It shows a world of fantasy that combines legends and popular and religious rituals, while creating a story, searching for meaning and relinking fantasy with reality, the true with the not so true. Some of the characters seem like points of reference in this fantasy world as they merge with details from paintings by Jan van Eyck, Hans Memling, Pieter Bruegel and Hieronimus Bosch. They bring to light what archives have kept hidden: the secret of oil painting discovered more than five hundred years ago and kept stored behind the heavy and elusive silence of stone...

Hard & software featured:

Image processing:

Henry Paint Box (Quantel)

Flame (Discreet Logic)

Video editing:

Video Cube with Photoshop

Edit Box (Quantel)

Audio morphing:

AudioSculpt (IRCAM)

Audio editing:

Sound Designer

Deck

Armin Bruderlin - Runs

Our piece is entitled "Runs", and tells a short story about "people in locomotion". Walking and running are such common activities; but where do we usually go to? This is about a very worthwhile place to visit which rewards the visitor with great satisfaction. Besides the artistic value, please note its scientific component: the walking and running sequences were not key-framed or motion-captured, but generated by our interactive, real-time procedural locomotion system. The data were then imported into Softimage which we used for all the modeling, facial animation, fine-tuning and rendering. This way, it was very easy, for instance, to produce several figures all running at the same beat to match the sound of the foot steps.

Daria Dorosh and Jeep Johnson - Location Intersection

Location Intersection began as a document by Jeep Johnson of the show Between Water and Sand by Daria Dorosh that was on exhibit at the A.I.R. gallery in the spring of 1994. Initially the work was recorded to show a representation of Daria's work. As we began the editing we soon became unsatisfied with the "traditional" approach of documentation. We began exploring how we could add another dimension to the material. We started to alter and digitally manipulate the images in MAC based computer programs such as Adobe After Effects and Adobe Premiere. We then edited the material in the MAC using the Media 100 system. The results were very exciting. We eagerly

continued down that path and started to integrate related visuals like a series of sand dune shots, aerials over the midwest, and still photographs of cityscapes. We found that in the digital domain the computer was able to integrate every kind of image we wanted to work with. Quickly we were able to create what felt like an infinite amount of materials to draw from. We continued developing distinct treatments for each section.

We took similar approaches with the sound track as we did with the picture. Recording sounds, inputting them into the computer and manipulating them in the digital domain. We discovered that similar to the images, the sound we could create and manipulate were endless. The computer facilitates the creation of a new space in reality. Unique juxtapositions emerge. We shot a gallery scene, removed the walls, and replaced them with an aerial image from the midwest. Time and location became the elements of a new language. The video reflects the integration of digital technology with traditional photography, video, painting and all other mediums. We are exploring this new language as we create it.

The video was co-directed by Daria Dorosh and Jeep Johnson. It was shot and edited by Jeep Johnson with constant input from Daria Dorosh. The digital images were the result of intensive collaboration between both artists. The process flourished with a successful collaboration.

James Duesing - LAW OF AVERAGES

Law of Averages takes place in a lush garden. The temptation in this garden, is an interactive theater called The Big Ghost. Vynola, an exotic Bird-like creature, is the bawdy tour guide in this endlessly exciting Cyber world (as long as the viewers have money to pay for it.) Destitute people, addicted to this entertainment, are frequently in the vicinity of the theater. Every one has a place that they live, some of them have a wall or two. They all have a couch and a TV because it helps them think. The Big Ghost is the only actual building in this garden. My work is informed by the politics of technology, sex and society. As I developed this project it became clear that the key to this work is in the portrayed environment. It is an environment full of contradictions. While it is a lush world, the plants and flowers are frequently personified spewing pollen, eating things or stretching their stamens out to rub against each other.

The Big Ghost is a monolithic structure amid the trees. The name, The Big Ghost, was used by Chief Kanhonk of the Kalapo Indians, in the Brazilian rain forest to describe television. The Kalapo Indians have no written language, their history was handed down through story telling. Television became a substitute for that story telling so a generation grew up with no interest in their history. In Law of Averages, The Big Ghost is not just an evolved constantly exciting entertainment. It is an addictive substitute for all interpersonal relationships. There is an additional unseen layer of control that is also being exercised in this garden. Its presence is represented only as stone slabs with directives giving exacting and restrictive guidelines on how to live your life. These slabs enter as scene dividers and they are carved with statements like: Trust Your Government, Aspire to Wall to Wall Carpeting, Buy Life Insurance, Be Caller #7 and Win the Free Dinner.

Through out the animation, the narrator speaks in first person of "I" and "you". No further names are given as the relationship unfolds: I meet you at a party where you are dancing so wildly you are politely escorted out. When I come to your place you have two cats, the evil cat breaks a bottle and becomes difficult to put out for the night. I see you at a bar when you said you had to work and imagine the fight we could have. I want to call a friend and talk to them about you, but everyone in my phone book is dead. The main conflict arises between this relationship and the relationship the narrator believes he has with Vynola in the Big Ghost. The animation is ambiguously resolved in quite companionship while The Big Ghost looms in the background. With this work I wanted to present an allegorical look at complex issues of contemporary gay life. I did not want to present a happily arrived at conclusion. I wanted to show imperfect characters making decisions about daily events while enduring the complications of technology, overly simplified doctrines for living, their pets and each other.

Ian Haig: Astroturf

With so much attention these days focusing on the utopian, new age promise of new technology... whether it's a Microsoft slogan on a billboard, an editorial in a computer trade mag or an artists' statement in an electronic art show catalogue, the rhetoric can often read the same: New and emerging technologies are opening the door to limitless possibilities...I am somewhat suspicious of the glowing pronouncements concerning the impact of technology on our lives, in response my work deals with themes of technological dystopia, devolution and mutation - a world of malfunctioning frankensteinian machines, grotesque human bodies and asocial computer nerds...and where technology is simply a more efficient means of going backwards... Much of my work is concerned with redefining the aesthetic in contemporary computer graphics, looking towards the realms of Pop art, and comic culture, while attempting to bridge the ever increasing gap between the world of technology, art and popular culture...

Craig Harris - Galileo's First Glimpse

Galileo's First Glimpse characterizes the moment when Galileo viewed through his first telescope. In an instant the world that has been intersects with the world of possibilities. The synapse created in their intersection transforms perception, and the world can never be seen in the same way again. These moments of dramatic metamorphosis provide opportunities to examine our existence and our goals as individuals, and as members of a global and universal community. The music incorporates recorded and transformed vocal tones, digitized waterphone performed on a sampler, and gentle synthesized tones, woven into a fabric of merging and converging sound worlds. Graphics are created by Lorren Stafford, using a system for converting sound signals into visual representations based on Fast Fourier Transforms, in an interactive setting for manipulation patterns, palette and motion. Galileo's First Glimpse was created for live performance, and was pre-

miered at the 1995 Divergent Streams/Convergent Dreams festival in Minneapolis, Minnesota. The excerpt presented at ISEA 96 is from a video version that had its premiere at the VIII Brazilian Symposium on Computer Graphics and Image Processing.

Oliver Hinsinger - Naughty Medusa

A Sunday afternoon in a small town. A man walks into shot. A little girl's voice is heard calling the man: "Hey you!!" The man turns around and looks straight into the camera and is instantly "turned to stone".....Medusa is at it again!

Troy Innocent - PSY VISION

"A fusion of iconic figuration and synthetic abstraction towards a language for the visual expression of electronic music." Inspired by the sounds and structures of techno music, the Psy-Vision project represents a set of prototypical language elements for the visual expression of this new sound. Elements of this language include textures, spaces, icons, movements, colors, and animated figures which are extruded into the abstract three-dimensional space of the computer. This video experiments with electronic communication and digital semiotics, exploring the increasingly significant relationships that humans have with virtual spaces and virtual images. These evolving relationships shape and reflect human identity. A central concept to this new way of seeing mediaspace is the creation of figures that are iconic in form, often remapping other cultures and meanings onto these forms. Consequently, the codes of our contemporary mediaspace have been sampled, reformed and mutated in Psy-Vision, deliberately detached from any narrative context. This allows the figures and forms to become "visual instruments" whose actions and movements are played in sequence like music. These sequences consequently create visual constructions that represent the sound and evoke mood and atmosphere. Dimensions of time and space are intrinsic elements in the structure into which the forms of Psy-Vision are placed. A key feature of the iconic forms that populate these digital realms is their capacity to mutate and reconstruct themselves in varying modes of representation. This fluctuation and mutation of meaning is a characteristic unique to electronic space, where information can be mapped in multiple ways depending on how its meaning is defined. The techno sound can be said to represent, among many other things, humans exploring the language of machines. The sounds are a manifestation of the ongoing development of relationships with machines and how we perceive their role in our lives. The music, which ranges from minimal abstract frequencies and rhythms to densely layered soundtracks and mutant karaoke, is spatial and experiential in nature and thus ideally suited to being mapped into virtual space. On top of the basic

elements of this spatial language, different visual styles are superimposed giving each track in the Psy-Vision sequence its own identity and place. The intention is not to create a Virtual mirror of reality, but to create imaginative new spaces, spaces that provide a "natural" place for this music to reside. Each visual space becomes the home to a particular symbolic form, which is explored over the four to five minute duration of each phase. It is in these new evolving spaces that electronic communication systems will grow, offering more suitable ways to describe "identity" in places that do not really exist. Although these images and sounds draw upon a wide range of existing cultural meanings, their representation in virtual space is relatively new to us. Thus their deeper meanings will evolve as they are absorbed into our culture.

Marcel Kaars - Curriculum vitae/artists statement

Education: Graphic design, Royal Academy of the Fine Arts, Den Haag

4th year student, Interdisciplinary studies in sound and sonology, Royal Conservatory, Den Haag

For the past two years I have been intensively involved in combining 3-D animation with electronic music. This has resulted in various abstract video films, clips and a science fiction film. More recently I have also begun to explore combinations including real space too, specifically, the flat image in space, and projection methods with regard to people and architecture. Almost as a counterpart to the production of electronic images, I also have a growing interest in primitive sound sculptures of wood, metal and water and the possibilities of existing conditions such as balance, gravity, cold and warmth and distance. In addition, I have been active as a volunteer producing children's television at the University Hospital, Leiden. I'm sure I have done other things, but I can't remember them!

Monika Karasova - Doom

In her work DOOM /by which she means ruin/, Monika Karasova presents a short story taking place in a 3D animated landscape with symbolic objects, which should sensually induce motion in space and its surpassing. Neither for the author, nor for the viewer the very story should be too important, because it is his story - he is the one who enters the story, the space. The visual effect is underlined by suggestive music by Roman Dzipinka. Its monumentality contributes the clear spatial feelings. The author relies on the overall emotional effect of her work. The project DOOM was created on Silicon Graphics computers, using Alias Software, in the Frame Studio in Prague.

Steve Murgatroyd - Doll

From Russian dolls and the party game "Pin the tail on the donkey", "Doll" finally emerged as an animated freakshow attraction. A freak trapped in the cartesian space of Harriet's 3D paste up programme which through trial and error developed arms and legs and avoided a lengthy narrative, only to end up inside Leonardo's universally recognisable World In Action drawing. Was that its destiny? Or

was it being manipulated by some very intelligent circles and squares ?

Monique Nahas - La Classe

For a few years, we have been witnessing an impressive evolution in computer graphics due to the rise of new "tools" of the Virtual. The various shape or motion acquisition tools now make possible an achievement of a realism to the extent of movie quality. In particular the improvement of laser based devices makes easy fast and high resolution modelization at all scales. Of course we are not yet able to synthesize entirely any given scene, but the trend that brings synthesis always closer to reality provides the artists with a new fascinating domain for creation.

Martyn Pick and Richard Wright - Gridlock

Gridlock is a unique blend of computer graphics, traditional animation, sex and violence. The piece is based on a series of vigorous graffiti style figures struggling with a computer generated mesh or cage. This is intended to bring together the spontaneity of traditional animation to the poise and control of computer animation, to create a tension between the grid and the creatures and their interaction. This approach is similar to William Blake's theory of the relation between energy and reason, as practiced in his engravings, where reason is embodied by line and energy by colour and texture. This piece could be thought of as an equivalent in a modern medium. Technical Notes Gridlock was produced by video grabbing several sequences of hand drawn animated figures and rotoscoped film clips. These were combined with 3D and 2D computer animation and further processed, recoloured and retimed. An interactive disk version of Gridlock produced in Director also exists and is available on the internet at www.ace.mdx.ac.uk/Hub/Hub.html. An interactive TV programme is also underway.

Dinka Pignon - INSIDE ROUND

Inside Round is about the mind, flabbergasted in the face of existential absurdity. Reflecting upon the outside ongoing life it is exposed to and being an isolated world of its own at the same time. We create the world we belong to. We belong to a world we did not create. Feet on the ground, head in the sky. Bustle all around us, stars out of reach above. A multimedia piece involving computer music and computer animation combined with prerecorded video. The picture and the music are equally significant. The relationship between them, which is complementary most of the time, is crucial to the piece - its expressivity and dynamics emerge from their interaction. The idea was to express the feeling of 'existential loneliness and absurdity', as a fundamental state of mind, by using extremely simple, elementary forms and gestures, which seemed appropriate for achieving that result. Inside Round is a contemplative piece and in a way could be even called minimalistic.

Todor Todoroff - Jeux des Reflets et de la Vitesse

This music was composed in 1995 for the one hundredth anniversary of cinema on the silent film "Jeux et de la vitesse" realised by Henry Chomette in France in 1925. It was commissioned by the Société Philharmonique de Bruxelles and by the Cinémathèque Royale de Belgique, with an ADAT tape playing the music. The music was composed in hexaphonic format and most of the sound materials were generated by a real-time multichannel granular morphing algorithm developed at the Polytechnic Faculty in Mons, Belgium, and running on the IRCAM Sound Processing Workstation. The older brother of René Clair, Henry Chomette made some experimental movies. This one is made out of retrieved fragments of pictures celebrating Paris as a town in perpetual movements. Most of the film is a long hypnotising run through Paris by train and by boat. The music accentuates the impression of speed and the constantly moving rhythmical and hexaphonic spatial sound textures surround the audience, creating spinning movements as well as a sort of music travelling. Passing through tunnels and under bridges becomes almost a physical experience...

Dominic Wright - ADMIRAL FLIPSIDE/ DAS NARRENSCHYFF (The Ship Of Fools)

Admiral Flipside is one crazy sea-dog. Driven by a darker than black alter-ego he embarks upon a bizarre voyage of destruction and self discovery. Haunted by his subconscious he is driven by ghostly manifestations into a surreal world of circus and theatre inspired by Sebastian Brant's 1494 book 'Das Narrenschiff'-(The ship of fools). Unbeknown to him he is the leading actor in a stage play based on the ship of fools. He leads the witless fools on a disastrous voyage to find 'Naragonia' (Fools utopia). Flipside finds himself the sole survivor after the ship is set upon by fire breathing monsters from the deep. He is washed up on the very beach that he left many years ago, only to discover his innocence waiting for him. Here at last, after so many long years searching, he is forced to confront the grim reality that is himself. These short films combine computer animation, Traditional animation, video and concepts of theatre to produce a bizarre visual story.

CONCERTS

Michele Biasutti - Tavola IV (1993) for viola and signal processing

This work is one of a series of pieces called Tavole in which the timbre and dynamic possibilities of the musical instruments were studied. Tavola IV, dedicated to the viola and nicknamed "of the rustle", utilizes the sound possibilities that the string instrument allows. The timbre has a very important part. The original idea was to point out on a so and universe that usually is very difficult to hear and made up of attack transitories, rustles and infrasound. These kinds of sounds are normally not utilized in music. The aim is to work into the sound, directly modelling the acoustic material. The formal organization of the piece is developed starting from single notes that were articulated following timbre principles. The sound discovery and the hypnotic movement were realized with the purpose of extending the perception of space-time. The premiere performance of Tavola IV was given at the Computer & Art Festival in Padua on the 24th of february 1994. The piece received the second prize at the XVI International Competition "L. Russolo" and is recorded on CD Fondazione Russolo Ef. Er. P94.

Agostino Di Scipio - Sound & Fury II

Sound & Fury is the title of a whole "class of compositions". Each piece has properties similar to all the other pieces in the class, but it also reveals individual features at every single public appearance. The concert performance features at least to levels of interaction: musician/computer and computer/environment (via controlled acoustical feedback). The details and the general layout of the music are experienced as emergent phenomena brought forth by the dynamical system constituted by these interactions. All sounds in Sound & Fury are generated in real-time with a fairly peculiar sound synthesis technique devised by the composer, functional iteration synthesis. This is a method of "nonstandard" digital synthesis of sound, i.e. a method which abstracts from known acoustical models (and especially from the Fourier acoustical paradigm). "Nonstandard" approaches to sound synthesis represent an area of research unique to computer music (among the pioneers in nonstandard synthesis of sound are I. Xenakis and G.M. Koenig). Functional iteration synthesis is modelled after the mathematics of "chaos theory". However, Sound & Fury utilizes such mathematical models not only for the generation of sound, but for the generation of the musical structure itself, as it unfolds in real time. Every performance reveals paths and trajectories of sound of its own, due to diffe-

rent starting parameters set up by the performer. In this way, every performance reflects in its timbres and textures, in the timing of its pace and rhythm - the notion of "temporal horizon", the "long-term unpredictability" of events (popularly known as "the butterfly effect"), a common feature of dynamical systems - not only natural systems, but also social and cultural systems. And the unpredictability, as well, of our experiences and life. (Hence the title, drawn from Shakespeare's *The Tempest*).

Mari Kimura - Works for violin and computer

A short program of interactive works for violin and computers. The program consists of the European premiere of EFFECTIVE (1996) by Robert Rowe, for violin and effect processor; ETUDE (1992) by Kimura, an improvisation work for violin and interactive computer system; TOCCATA (1935) by Conlon Nancarrow, a work for player piano (MIDI piano) and violin.

Yasuhiro Ohtani - Invisible Objects

I am an improvisational musician using computers, a participant in a network of Japanese musicians, and I have organised projects. My project "Invisible Objects", utilizing two Macintosh Powerbooks, is a challenge to myself to create real-time sound, play improvised music, in real-time interaction with the computer, pushing the use of technology in a live situation to the limit. All composition, performance and restructure is by myself. Other projects in which I have been involved are the "Realtime conducting system" which I created and developed, using Macintosh EtherTalk and Internet, and "OTOMO Yoshihide", working together with Sampling Virus.

Christina Viola Oorebeek - Tuning Studies for Yamaha Disklavier

I have always been fascinated by the sounds of piano tuning and wanted to write a piece based on the ritualistic atmosphere it can evoke before a concert begins, a kind of aural prelude. A good piano tuner is a musicmaker in his own right. He restores anew the raw materials used by the composer and performer according to the tuning of the day, laying the foundation for the realisation of their music. Every tuner has his own working rhythms combining the shifting of the hammer to a new tuning pin, playing the key to be tuned, adjusting the hammer to move the string onto the "right spot". A tuner is continually listening to the speed of beats between intervals to determine the accuracy of his work and has his own special checks and controls to engineer a harmonic balance over the keyboard. These rhythms and the melodic and harmonic elements drawn from the equal temperament tuning were the source of the musical materials in the piece. I used the Yamaha Disklavier because I wanted to have the freedom to write for the piano without the technical limitations of a pianist and yet employ an acoustic instrument. Using the notation

software Finale in a computer provided the means to write not only the notes but, also, to program the "interpretation" for the concert. Because a human performance is never entirely possible using a computer, the slightly mechanical sound produced on the Disklavier gave a quality I was looking for - "the piano tuning that became realtime music".

ted and move inside the speaker-set-up via the bassclarinets and the el. guitars MIDI-interfaces. The harmonic and melodic material is developed on the basis of the relation between the digital microtonal and the analogue diatonic instrumentarium/gearium: JORGEN TELLER; Cazio MIDI-guitar w. EPS-sampler, DP-4 effect w. realtime ctrl., distortion, wah JAKOB DRAMINSKY HOJMARK; Bassclarinet w. IVL-pitchrider to AKAI S-1000-sampler, ZOOM 9030 effect w. realtime ctrl.

Vibeke Sorensen - Panini Stickers

"Panini Stickers" is performed by [THE], Ed Harkins and Phil Larson of the University of California at San Diego Music Department with video by Vibeke Sorensen of the School of Cinema - Television, University of Southern California. This piece is a development of a project originally prepared in 1959 for bassoon and dancer (dancer). It was premiered on national state radio (Birdies) as part of a video for a California political convention.

Pete Stollery - Altered Images

The aesthetic images which occur in the mind of the listener during the performance of a piece of music and how they relate to the way the music is perceived are the concern of the composer. The placement of sound images in three dimensional space when performing electroacoustic music on tape over a number of loudspeakers and how this imaging relates to the way the music is perceived by the listener is the concern of the sound diffuser. As a composer and performer of electroacoustic music on tape, I wanted to create a work in which I could investigate and explore these two aspects of "image". There is an interplay between the real image and the altered image throughout the work. Sometimes a sound may be recognised and associated with one in the real world, but these images change over time, as does their associated "meaning". Similarly, the position of the sound image is constantly changing, sometimes slowly, at other times rapidly, and the breadth and depth of these changes are of course enhanced when the piece is performed over a multi-channel diffusion system. *Altered Images* was realised in the Electroacoustic Music Studios at Northern College, Aberdeen and at the University of Birmingham in August 1995. It was premiered in Montreal in January 1996.

Jorgen Teller and Jakob Draminski Hojmark (TZARINA Q CUT) - The H.A.L.I. Configuration

Performs duo pieces from THE H.A.L.I. CONFIGURATION: Bassclarinet & electric guitar with direct MIDI control of AKAI/EPS-samplers (o.a. tuned microtonally and using grain-synthesis) & effectsprocessors. "SAMPLIFIED"; 35 minuts piece in 5 movements "HOW TO MOVE A H.A.L.I. YARD"; 30 minuts piece in 3 movements. The pieces expanding soundmaterial uses 12,19,24,31 & 53 tones in the octave. The original sounds for the pieces are programmed into the 2 samplers, so they continuously can be modula-

EXHIBITION: INSTALLATIONS

Peter Bosch and Simone Simons - The Electric Swaying Orcherstra

Please look at the abstract under category 'posters'

Martine Corompt - Sorry!

SORRY! is an interactive computer installation which exploits the stylistic slapstick violence/humor of mainstream Western animation and comics to challenge the viewer to rethink what effect representational graphics really have in a "user-friendly" environment. SORRY! consists of four buttons which are associated with four characters. The player must first select a particular character (by pressing down on one of the buttons) and then continue to press down on that button causing the character on the screen to flinch. With each successive "blow", the character deteriorates more and more, drawing heavily on the visual codes and devices of cartoons that are used to represent pain, wounds and death, as well as the suggestive power of sound effects to induce the impression of a heightened sense of impact. If the player continues to pound the character, it will eventually "die" - but only to reappear a few minutes later as bright and perky as ever, and the process may begin all over again. Though "game-like" in appearance, SORRY is not really a game, as there is no skill needed to use it, and no element of chance. There is only one purpose, and that is to allow the user to inflict inane and senseless representational violence onto an inanimate object. While on one level Sorry may be seen as an elaborate electronic punching bag, a therapeutic device for the stress of our electronic age, it also seeks to explore the idea of how we can so easily empathise with a mechanical device, if it simply has some kind imitative human quality, no matter how stylised or abstracted they maybe. With the ongoing development of user-friendly interface design for the personal computer, we as users are being continually required to "suspend our belief" of its mechanical nature and instead regard it with more human virtues of intelligence, patience, helpfulness, and even personality. But no matter how friendly computers attempt to be, when things go wrong, - a system error, bug or whatever, the facade melts away and we are once again confronted with nothing more than just an idiotic, cryptic, computing machine. Sorry attempts to intensify this paradox by creating an absurdly user friendly environment, the epitome of personified technology. But in order to cooperate or interact with this friendly beckoning blob, you are required to abuse it, and like the dumb machine that it is, it must endure the procedure according to its programming, which is until the user is satisfied. However the "abuse" of course is purely subjective and regardless of whatever aural or visual messages we are receiving from the console, they are nothing more than binary coding to the computer. We are suspended between the desire to project life into these graphic representations of cute, infant like characters (by pressing on a button) and the comforting (or frustrating) reality that it is in fact only a machine.

Greg Garvey - Genderbender

The attract mode of GENDERBENDER displays the following: "Are you really a man or a woman or a little bit of both? "Etes-vous un homme ou une femme ou un peu les deux? "Now you can be sure (or can you?!)" "Maintenant, vous en tes certain!(l'etes-vous?)" Although on the internet no one may know you are a dog GENDERBENDER performs a much needed public service by minimizing the cognitive dissonance of gender confusion and subterfuge found in chat groups, MUDDS, and MOOS. Inspired by standard psychological tests for gender and personality profiles and Alan Turing's test for Artificial Intelligence. GENDERBENDER allows a user to self administer a gender test. Based on the user's responses the "Computer Psychologist" will display the message, "You are a man!" or "You are a woman!" or "You are androgynous!" The "two player" version allows two users to view the responses of one another. Each in turn can guess the gender of the other player and whomever the computer psychologist agrees with is the winner(?). CUseeme teleconferencing makes it possible for the users to compare a video simulacrum with the assessment of the Computer Psychologist. At the start of both the single player and two-player version the Computer Psychologist will display the first of a series of questions randomly selected from a possible total of sixty. The Morph-o-meter displays KENBY an androgynous 'virtual' figurine. As a user answers each question with yes, no or don't know the Morph-o-meter gives instant feedback on whether masculine or feminine characteristics predominate in the user's personality by morphing towards a identifiably male or female figurine. The Tile-o-matic will reveal each user's video image tile by tile for each yes response. For each don't know both the Morph-o-meter and the Tile-o-matic do not change. GENDERBENDER (Release 1.0) was exhibited as part of the summer instalment of Image du Futur in Montreal (May-September). GENDERBENDER Release 2.0 will introduce the two player internet version. GENDERBENDER Release 3.0 will contain the additional feature of the creation of an online avatar that reflects the gender profile that the user gives it. The Self-Test allows the user to construct a personal gender profile of twenty masculine, feminine or neutral traits. Once created it can act as a gendered knowbot that will visit chat groups, perform searches and then report back to its master on its discoveries, experiences, exploits and perhaps provide a little black book for actual meat and flesh encounters.

Allan Giddy - Clock; Hours remaining in the life of Allan Giddy

Both pieces are provoked by Rudolph Steiner's questionable statement, "everything in the universe is made from light".

I hypothesized, that if everything was indeed made of light it would therefore be deconstructed by light's incessive bombardment. After consulting physics Professor, John Smith of the University of New South Wales, Sydney, Australia, I came to realize that this deconstruction did in fact take place with many materials.

"CLOCK" was the first work to deal with this theme (light as both giver and taker of life).

CLOCK

Construction: Molded aluminium, stainless steel, halogen light and wood

Size: 30cm + 15cm + 36 cm plus wood

The plaque on the front of "CLOCK" reads "THIS LIGHT WHEN ACTIVATED WILL COMPLETELY DISSIPATE THE WOOD SPECIMEN WITHIN 350 YEARS". 12.5.93

A thoroughly analogue construction, the light in "CLOCK" will (By breaking the carbon bonds holding the wood together), evaporate the wood within 350 years. Sitting next to "CLOCK" is a replacement wood specimen, the "TOCK" effectively of "CLOCK"

HOURS REMAINING IN THE LIFE OF ALLAN GIDDY

Construction: Electronic components, LCD's, solar panels, pillow, chair, light bulb, broken light bulb.

Size: 50cm + 50cm + 100cm

This work is the second I have constructed to deal with this (light-based) theme. It is a digital construction.

"Die verbleibende Stunden im Leben des Allan Giddy" is a backwards counting machine. I calculated how many hours I would have left to live based on the average for a New Zealand male born in the 1960's, this I then programmed into my small machine and set it running. I took care, allowing the machine to retain memory (using capacitance) during "night-sleep" periods when the display disappears while the "machine" counts more slowly. Somewhat more theoretical than "CLOCK", this piece, while counting the hours remaining until my presumed demise, is in fact an autonomous agent, freed from its maker while contracting its rhythms and pace towards demise from its independent reaction to the light around it

Masaki Fujihata - Beyond Pages

This installation tries to realize a virtual book. Its aim has been set to go beyond the book; to add interactivity. In this installation, an image of a book is projected from the ceiling on a white table using a LCD-projector in a dim lit room. The book can be manipulated interactively according to the participants' action with a wireless digitizer pen. The image of the book is totally controlled by a Macintosh computer using MacroMedia Director. The book is designed for arranging the objects into class and each object reacts interactively. For example, an apple on the page will be bitten when one flips the pages. On the other part of this book, there is a stone on the page that will runaway when touched. Infinite objects can be included into this virtual book with infinite pages. It's a new style of archive for an interaction or categorization of the relationship between objects, humans and the world. The function of a book is to describe the world. "Beyond Pages" is also the world which will be describing as the active model of the world.

Erina Kashiara - Light Extension

I use new materials and new techniques for making forms of unchangeable beauty. It symbolizes humans have something that are changeable and something that are not in time. Materials and techniques may become old, but I hope these forms will be understood in time. And together, I suggest to the audience how people may or may not choose to express themselves.

My work doesn't belong to art nor fashion. I think my work belongs between them. My work expresses anyone's existence, who wears my work. This idea is different from art, which expresses the artist. And it is different from fashion, because fashion changes from with the stream of age. And these wearable sculptures, which display various patterns in response to anyone's delicate motion, are creating another time flow and another space between anyone who wears it. This is how my idea is different from others.

Bruno Koenig - Emulseed

This piece is composed of human voice (and digital technology) using the phrasing of read text and dividing it to find sub-structures. The visualisation of the text on the computer monitor screen has allowed the editing of each piece of text to be determined by the natural pulse allowing for the true character of the languages. These have then been looped to create the continuous rhythms and field of each language.

The recording of various section of pulse creates a rhythmic interaction, with some semblance of unison unique to each language. This piece starts with a combination of the four languages, followed by each particular language setting up its own rhythmic field to explore distinctions of tone, rhythm and vocal technique. The four languages are JAPANESE, URUGUAY (Spanish), FINNISH and IRAELI (Hebrew).

In affirmation of the different cultural origins of the prosody, common objects from each culture have been displayed preciously in museum conditions, signifying epistemological difference.

The installation is composed of a space in which four sets of objects are displayed in conjunction with four speakers sounding the different tracks of the composition made from the pulses of the languages culturally relative to the objects.

Location: Rotterdam Ethnological Museum

Fred Kolman - Kolman's Kube

Who has not dreamed about his or her movements transformed into sound? In Fred Kolman's interactive installation the spectator becomes the instrument and thereby the work of art is created. This entirely computer controlled installation transforms the movements of the head, hands, and feet into sounds, which the artist in advance had defined for specific areas of the room. It is Kolman's aim to create a monument in the room rather than creating a composition of sounds that exist in time. Kolman himself gives performances, he does improvised dances inspired by the basic movements of Tai Chi. The perspective of 'Kolman's Kube' are splendid, one could imagine dance and theater performances in which the music is controlled by the dancers' movements. The installation could be moved out into the city and let thousands of people become instruments of a 'street symphony'. It is a demand from an interactive work of art that the spectator participate in the creation of art, if not, it does not come into being.

Arleen Schloss- Marbleyes

"Marbleyes" consists of an opaque screen embedded with 3-d, clear glass marbles that is mounted on the front surface of a video monitor. Video output can be in many forms: electronic art, web art, as well as live-feeds from on-going installations with ambient sound and live camera/audience participation. My long-term involvement with both audience-participatory performance art and making video art "live" inside the camera, has given me both a micro and macro view of the world. Perhaps this is why the 3-d optical effects offered by the interface array of the glass marbles hold such a fascination for me. I began to see the resulting array of 3-d images as a metaphor for the multiple lenses in the eye of insects such as the horse-fly, dragon fly and others. Although composed of thousands of separate lenses, their eyes function as a whole. This is also, of course, a wonderful metaphor for the multiplicity and interconnectivity of the world eye - the WWW.

EXHIBITION: STILLS

Kat O'Brien - Moving Forward Beyond Beijing

Moving Forward Beyond Beijing is a video collaboration by three artists who travelled together in China for four weeks in 1995, concluding with their participation in the United Nations' 4th World Conference on Women in Beijing, reportedly the largest gathering of women in history. Artists Liz Dodson, Kat O'Brien and Cecilia Sanchez-Duarte live in the USA, Canada and Mexico respectively. They were delegates of the Women's Caucus for Art, unique as an arts organization granted *non-government organization* status by the U.N. to sponsor activities at the Beijing/Huairou conference. Dodson, O'Brien and Sanchez presented their work in exhibitions and panel discussions, demonstrating a variety of personal approaches and cultural perspectives through their usage of computers and video. Currently, the three artists are developing a video collaboration in which each will present a five-minute reflection on their shared activities during their month's experience in China. They are also exhibiting individual video pieces and computer-manipulated images in *Beijing and Beyond*, an exhibition originating at Lieberhouse Gallery in New York and travelling internationally for two years.

Bruce Cannon - Ball and Chain; Cask; Patronage; Portrait (abstract not available at time of print)

Achamyeleh Dabela - Digital Art/ Digital Painting: A Personal View

If I were to use a simple cliché, I would say 'an Art is an Art' hence simply explained my work as a digital artist is...'. However, I can not as an educator get away by such an explanation, nor would I do justice to this phenomenon that is described as digital art. A few years back when I started to explore the technology and its tools, those who dared to write about it struggled to explain and articulate the unique qualities inherent to the technology and the end product that is presented as 'Digital Art'. Some wrote about this art form as a 'Computer Generated Art' or 'Computer Art' and others saw the need to develop a manifesto that attempted to provide a forum. Be it the manifesto on Dataism, or attempts at addressing the algorithmic beauty that is imbedded in the design of a given program, critics and art historians alike are still out forging an aesthetic criterion to an art form that uses an ever evolving technic and technology. Be that as it may I approach the new tool with in the context of a panhuman universe where I attempt to function by its influence and at the same time influence it by bringing to it a culture context. To this end I have so far enjoyed creating and discovering with the computer as an assistant. I can speak of digital art as a computer assisted art not a computer generated one. Simply put the computer and associated software compliments and enhances my ability to create and do not contribute in developing original concept nor do they generate an art work. However, they play a crucial role in making it possible for the artist who is willing to use them. This does not mean that the computer does not have an input in the process, in-fact it does. As in any traditional medium the tools and materials used contribute to the final looks of the image created. The difference

is on the skill and knowledge of the artist. Although technical know how does not guaranty artistic and or creative dexterity if combined one is sure to express an idea with certain level of sophistication as well as simplicity. In other-words, if an artist is interested in using water color, he or she is obligated to know and discover all possible means associated with his or her chosen medium.

I feel honored to be in the company of those that are now referred to as artists of the cyber culture. As an individual with a specific cultural background I bring to the computer canvas a variety of ideas, some that I have completed or have resolved via paintings using traditional tools. Sources from my acrylic on canvas paintings or other works on any number of mixed media, photographs, three dimensional images that I create in the computer world, and or drawings, sketches etc. These sources are selected, digitized or scanned and filed as image data where I have access to as many or as few of them as I need. I use these resources selectively concocting portions of colors here, parts of figures there or a variety of African surface decorations, designs and or motifs. After a certain amount of creative process I come up with my final composition of a visual music and present it in the old fashioned way, a two dimensional graphic representation framed or on the computers screen world.

Liz Dodson - Time Speeds By

As an artist, I have moved along a path from drawing and painting to electronic art and video. I seek to explore the passageways we travel in life and I am interested in trying to find the edge between meaning and the abstract. Various visual images of fractals, strange attractors, and chaos all starting from mathematical equations are an intricate part of my art; seeing the world through the blend of art, nature and science. Recently, women's issues...especially after attending the Fourth World Conference on Women in Beijing, have become the themes, concerns and are now a prime mix in the imagery of my work.

Ian Haig - Mighty Morphing Muscle Men

The body is being enhanced, modified and upgraded. These hypermuscled morphing bods also represent the body in a state of impending collapse. The body pushed too the limit, with no place left to go. Mighty Morphing Muscle Men seek to heighten and satirise the body: Somewhere between the masculine fantasy of the super, maxi, power, bodies in computer games (like Virtual Fighter) and the underlying macho power base which seems inherent in so much 3D computer graphic aesthetics, iconography and advertising.

Lane Hall and Lisa Moline - Joyce Astronomia Series: Stand Against the Moon, Astronomia, Cosm

Lane Hall and Lisa Moline have created a collaborative series of prints entitled "Joyce Astronomia." These prints are a complex combination of computer graphics and tradi-

tional printmaking media. Hall and Moline build small sculptural models to video digitize, and then use the computer to manipulate the digitized images, and combine them with text and other computer-generated elements. Hall and Moline then use laser printers and different colored toners to print these computer images on paper. Often the individual sheets of paper are laser-printed three or four times, to achieve an interesting layering and superimposition of colored toner. Then the prints are taken to the lithographic studio, where they are hand-printed in bright colors using hand-drawn images on lithographic stones. This combination of old and new technologies makes for unusual and compelling "computer art."

Lane Hall and Lisa Moline have been working with digital technology since 1987. They are intrigued by the computer's powerful possibilities of image manipulation and have sought to combine that with the physical properties and qualities of traditional printings and prints (their scale, texture, materials, surface). They are committed to approaching digital technology with an inventive spirit, one which combines the "hot" or emotional realm of art with the "cold" realm of computers. They are also committed to exploring creative output solutions, unusual ways to liberate the computer image trapped inside the monitor.

**Bill Hart - Fine Art Research & The Digital Image:
Bridging the abyss between the technical and the aesthetic.**

Art schools within Australia have been subsumed into the University system, in line with this they have been forced to compete with the traditional university disciplines for research funding. The application of electronic technologies to the visual arts has become a fruitful area for conducting (and having funded) Fine Art research. The concept of research in the visual arts is somewhat antithetical to 20th C. modernist (or even post modernist) notions of art practice. Current research projects focusing upon aspects of digital imaging at the Tasmanian School of Art not only seek to explore and extend the printed digital image, but to develop multidisciplinary research paradigms within the visual arts which allow the aesthetic to drive the technical aspects of research. The focus of current work is upon the printed digitally processed image, initially attempting to transfer many of the traditional skills and approaches of painting and printmaking to digital imaging. Along the way many aspects of the imaging and printing process have proven to be unsuitable or unsatisfactory, seeking to address these problems involves delving into the technical/engineering levels of the processes. What has begun to emerge are not only possible solutions to problems with the digitally printed image, ideas about how imaging software can be made more flexible and expressive, but as a realisation that aesthetically directed research can produce more useful and effective outcomes than those where only engineering or technical aspects are considered.

Jawek Kwakman - The End of Fertility as we know it

The presented work: "THE END OF FERTILITY AS WE KNOW IT" is a comment on the fact that fertility is now in the hands of science. In vitro, cloning and DNA techniques are the tools with which fertility is under scrutiny in powerful laboratory's thus dictating the way fertility has to go. In the presented work I used microscope images of Ovary's placed in a background of Hubble telescope images of the crab nebula. Both representing nature's fertility. Since 1985 do I use electronic imaging to realise 2 and 3 dimensional artwork. My workfield is: "THE MICROCOSMOS", the area between micron and atom, revealed by electron and light microscope, showing nature's miraculous constructions beyond our perceptibility and notion.

The basis for my work, the monochrome, green electron-microscope images, are transferred to videotape and digitized into the computer. In the computer I am manipulating, filtering and adding other images until I feel that the complexity and beauty of that hidden world is made visible. The finished image is transferred to m.o. disk and sent to the U.S.A. to be printed on a large scale inkjet printer which is able to print the image any desired size. The prints can be used for inside and outside environments. They are printed on vinyl with acrylic paints. The smaller images, are also inkjet, but printed on paper.

Bonnie Mitchell - Transitory Silence and Spontaneous Reclamation

The transition between end and beginning involves an understanding of the irony of these words. Because of the interconnectedness of natural elements and the influence one event or entity has upon the other, there can be no ending status in nature. Spontaneous Reclamation deals with the juxtapositioning of decay and rebirth; old and new; and organic form and geometric structure. The evolution of natural, organic elements into structured entities is governed by an understanding of the nature of reclamation. As an artist, I attempt to reclaim the essence of an experience and in return the experience gives birth to an idea. I massage the idea into tangible form and work in harmony with the medium. The chosen medium guides the process as well as provides challenges for defying the limitations of the medium. Therefore the birth of the tangible form of the idea is no more a beginning as it is an end. The changing of the seasons marks a beginning to some individuals and an end to others. Spontaneous Reclamation is part of a series of images inspired by the decay and selective perseverance of natural elements in autumn. The essence of life begins to succumb to the grips of death yet an alternate form of life evolves from the decay. The image deals with alternate forms of spatial perception. The illusion of depth and translucency works to connect the elements into an interwoven array of rebirth and decay. Visually we are allowed to traverse the spatial arrangement of elements yet we have no grounding in reality. We must carry with us the concept of up, down, in and out. We make connections between visual experiences in our life and the spatial arrangement of the elements.

Spontaneous Reclamation attempts to capture the essence of experience and challenge our notion of beginning and

end.

Cynthia Beth Rubin - Polish Dreams

Through several years of exhibiting computer art, I have moved toward revealing more of my processes as an artist to the viewing public. I find that the more that I share with viewers, the more responsive they are to the work. The commonly held belief that the "work of art should stand on its own" has proven to be both untrue and limiting, as the viewing public has become more habituated to forming links in understanding art and what the artist is doing. My works are based on cultural memories. They are my response to places, artifacts, and images that touch my interior thoughts, and I present them in the intertwined fashion of remembered history. This, however, is my imagined history. Several of the images draw from my personal heritage of Eastern European Jewish culture, but the references are not exclusive. Just as my actual experience is a cultural composite, so are my images.

Nadine Salas - The Decisive Moment

"Photographs do not lie, but liars can photograph" Lewis W. Hine

Has "the truth" ever found fertile soil in a photograph? Photography has finally come into its own right as an art form; it has entered the phase of self-examination. By grace of computer manipulation software I examine photography: its themes, its conventions, its grammar and its visual language. I work these elements; I turn them upside down, I manipulate them, I associate and deconstruct and then trick the viewer into thinking that he is dealing with a conventional photograph. A beautiful picture, eager to please one's eye, willing to comply with the viewers conventions. How many people just walk past by my pictures, not noticing the chaos lurking beneath the shiny surface, the truth being attacked, twisted by computer algorithms. These photographs are my struggle, dealing with reality, truth, representation, manipulation and ethics. It's much easier for me to make conventional documentary work, so much easier. But my computer manipulated photographs present a much greater challenge to me: The examination of reality, which I consider one of the most, if not, the most important theme in photography. I am a photographer. My tools are my camera and my computer. I MAKE photographs. Let me paraphrase Fred Ritchin: The "decisive moment" as formulated by Cartier-Bresson, may not refer to when the photographer made the picture, but can refer to when the image was modified.

Phillip Sanders - Tompkinsville Waits

This piece is an electronic photo/painting: it originated as video, was digitally processed, transferred from one computer platform to another, then completely reworked and reassembled as an electronic painting using various software including Fractal Painter and Adobe Photoshop. Not one original pixel has been left standing - all have been transformed - sliced, chopped, diced and painted over. The work starts as an event in time and space, a small part of a much larger continuum, in which apparently unrelated pro-

cesses and individual intentions come together and interact meaningfully in the presence of an observer who records the transaction. Much like real life and thought, the event is then disassembled into its component parts and reconstructed according to the needs and concepts of the individual as historian, partly shaping the mental structure, partly being altered by it. Finally it becomes a resonant framework, a mental construct made up of memory, ideas, physical records, and intentions. This composite is then projected back into the physical world as a starting point for new observations.

Patricia Search - Hickory Dickory Dock: The clock strikes one in hyperspace!

The work on exhibit at ISEA96 is an excerpt from an installation entitled Hickory Dickory Dock which is a critical commentary on the aesthetics of space and time in interactive computing. The installation is a three-dimensional layout of the storyboard for an interactive computer artwork. In the installation twenty-four screen designs are framed and hung back-to-back to create twelve stations that are arranged in a formation resembling the mathematical symbol for infinity. The screen designs are mounted between oversized pieces of Plexiglas, creating transparent borders that visually link the storyboard with the external environment. The installation highlights the conceptual and aesthetic limitations of language and symbols in describing the process of human-computer interaction. The screen designs in the storyboard use language and symbols to show how Western temporal references limit the interpretation of time to specific perspectives and discrete numerical values. These references include answering machine messages; temporal orientation cues such as the days of the week, Recorded Earlier, EDT (Eastern Daylight Time), Now, Earlier, Later; and references to Mother Goose nursery rhymes, a form of early childhood exposure to the use of language to define time. Most screen designs contain a frame in the center that acts as a "window" on time. Some screens also include transparent, three-dimensional (3-D) graphics to remind the viewer of the spatial dimensions of time. The 3-D installation plays an important role in helping the viewer understand the limitations of symbols and language in human-computer interaction. The installation forces the viewer to abandon the interactive conventions (mouse, keyboard, touch screens, etc.) and metaphors that we blindly accept when using the computer. The viewer must translate the commands and symbols in the interface design into movements and actions in the 3-D environment. In this process, the viewer experiences the problems inherent in trying to use visual and linguistic abstractions to define concrete logic. The installation shows how the symbols and language of computer interfaces create perceptual paradoxes that conflict with our cognitive and aesthetic interpretations of space and time in a 3-D environment. These paradoxes are further emphasized by the use of music in the installation. Wireless infrared headphones allow viewers to independently experience low-volume classical music (the Brahms Waltz in A Flat) as they walk through the installation. The holistic qualities of the music contrasts with the fixed frames and measured layout of the

installation, emphasizing the dichotomy between discrete mathematical references to time and the ethereal, continuous representation of time that we experience in 3-D space. However, the semantic structure of music also reinforces the semiotic constraints of the language and symbols in the storyboard, providing a satirical commentary on the prominent role that mathematical measures of time play in a technological society.

Lloyd Sharp - Waiting to get in; My left side(abstract not available at time of print)

Alexa R.W. Smith - Nanoworlds

Nanotechnology is an idea with far-reaching consequences for almost every aspect of our lives. It is the ability to have precise control over matter and is one of the most fascinating areas being studied today. Some areas of research that would be rapidly altered are computing, medicine, manufacturing and space travel. In addition, with these changes, social issues will also arise. Many estimates put the first arrival of this technology 10-20 years from now which is well within most of our lifetimes. As one of the first nano artists, Alexa created the series Nanoworlds to abstractly express the "spirit" of current ideas in nanotechnology specifically and the excitement of future science generally. Each image represents a glimpse of different applications of nanotechnologies. Her work is exhibited on the World Wide Web in the NanoGallery at Nanothinc, A California Corporation's website (<http://www.nanothinc.com>).

Gerd Struwe - Yellow Simulation

Yellow Simulation is a composition of 49 computer generated images. The individual prints are made using a program called "Automatic Sketch Artist" with compositional data set to favor "yellow". The presented prints show only examples of the process "yellow". These moments, taken from a dynamic image can never fully describe the algorithmic process but only simulate it. A peculiarity of "Yellow Simulation" is the non-chronological order of the prints. As the composition is set for a dynamic aesthetic, it became necessary to find a complimentary static composition. "Yellow Simulation" therefore does not show a simple sequence of moments, but rather a specific static composition.

Allan Sutt - Selections of Self Potraiture

The content of my work deals with the exploration of myself through self-portraiture. I use modified self-portraiture as a basis for investigating and affirming my fears and strengths. An integral aspect of the content is in the process involved in devising the image. The significance of the process in the content is that it takes many steps to complete the image, and at each step the image is changed. By using a computer as one of the steps in the process it increases the possibilities of the directions the image may be going in. I never know what the final image is going to be. Therefore the more possibilities there are, the more

likely I am of discovering more about myself through this process.

Anna Ursyn - (abstract not available at time of print)

Roman Verostko - The Scribe

THE SCRIBE: an electronic scriptor. While circumstances have prevented the physical presence of THE SCRIBE at ISEA 96, this document, along with the artist's slides and brief informal video, provide information on THE SCRIBE (and its historical origins). The SCRIBE is essentially a "personal expert system" consisting of a multi-pen plotter driven by original code. Developed over a period of 15 years this robot-artist literally "grows" visual forms from randomly generated bits of information. Drawing from a bank of technical pens the SCRIBE automatically executes art-works on archival quality rag papers. The software has accumulated thousands of lines of code, and has come to embody artistic procedures evolved from the artist's earlier work as a painter. All form-generating routines operate within parameter limits that are preset by the artist. THE SCRIBE then works on its own, making form generating decisions within those parameters. This includes ink pen choices. INTERPRETATION. THE SCRIBE, an electronic "scriptor", is our equivalent of the medieval manuscript illuminator who worked in the scriptorium. Random bits of information are transformed by THE SCRIBE into visual forms which celebrate the information processing procedures that drive our culture. THE SCRIBE employs a pseudo-randomizer to cast around for working parameters to initiate yet one more form. Laboring under a set of artistic procedures evolved over a period of years, the machine hesitates, reaches for a pen and proceeds to execute pen strokes. It does so with the same "seeming" intelligence of those ubiquitous machines whose algorithms control more and more of our daily routines. Through its drawing activity THE SCRIBE invites us to ponder the nature of the human-machine intercourse so pervasive in today's culture.

James Faure Walker - Leicester Square Pictures

"Leicester Square is the cinema centre of London. Tourists come in their thousands every day. Families argue about Pizza Hut or Burger King. People walk to work, mill about, carry bags, check maps and watches, and complain about the shoes they've just bought. Using an electronic camera every day for several weeks I collected my data. I toyed around with these images for a while, before finding these patterns, sometimes using arbitrary backgrounds (dishwasher interior, sex shop), sometimes getting more filmic. As someone who mixes the digital in with the painterly - my paintings are much larger and now use a stencil technique to bring in the Mac processed stuff - I've been anxious about keeping in contact with the very ordinary world we actually live in. I suppose I'm an abstract painter in some ways, but don't like being that way. So instead of wafting to fantasy land (the destination for many of these distracted pedestrians, maybe going to the interactive rock museum) I use software to keep my eye on what's around me...its mysterious beauty."

Annette Weintraub - Realms

EXHIBITION: CD-ROMs

(abstract not available at time of print)

Roz Dimon - The World's Greatest Bar Chart

An interactive art work on CD-ROM "The World's Greatest Bar Chart" takes a serious but humorous look at humanity's obsession with comparative measurement, a phenomenon particularly cultivated in capitalistic nations like the United States. The piece's structure is based on the analytic bar chart used by businesses universally, but in this case juxtaposing everything from vitamins to whales to bomb sites. There is an additional irony to the piece in that such an illogical construction arises from the tools and language of the ultimate machine of logic and measurement, the computer. "What makes this multimedia artwork significant is that it succeeds in transcending the inherent limitations of its medium. Although the cyberpainting's enigmatic interface is based on the structure of a traditional bar chart, it invokes a distinctly sensory quality through the use of images, color and sound.

Jayne Loader - Public Shelter

Since I started making collages with paper and glue when I was a teenager in Texas--and selling them on the walls of local Mexican restaurants for \$50 a pop--I have always been interested in finding images and recombining them in new and different ways, so that the meaning of the new object subverts the meaning of the original image. I have tried to use original documents to tell certain stories, unintended by their original makers. Point of view is expressed by the selection of documents, and their juxtaposition. Not until many years later--when Barbara Kruger reviewed my work in Art Forum--did I learn that the form I was working in was called "appropriation art." In The Atomic Cafe, we attempted to combine the principles of cinema verite and appropriation art--in the tradition of the great anti-fascist, John Heartfield, and Robert Coover's The Public Burning--to produce what we used to call "compilation verite." The images we appropriated were ephemeral films, created by the United States government, designed to make people stop worrying about the atomic bomb and threat of nuclear annihilation. We recombined these images, so that they highlighted the absurdity of the pro-bomb propaganda and also revealed how deathly afraid Americans were of atomic war in the 1950s. In my novels, essays, and short stories, I appropriate (and reassemble) my own life. With my CD-ROM Public Shelter, I tried to expand this found footage concept to the field of multimedia. The CD-ROM format is ideally suited for this kind of approach and even allows one to expand and elaborate on it with the addition of vast quantities of text. I was thus able to add another layer of content to the mix, along with the sounds, videos, and still photographs which I have worked with in the past. We can now go from the CD-ROM directly into cyberspace with the click of a mouse. The CD-ROM thus becomes merely a starting point for an experience that is completely unique and not controlled by us, the artists. Multimedia is thus a perfect and appropriate venue for both political art and intellectual discourse. Not only is it participatory--by its very nature forcing one to actively engage the material, rather than passively receiving it - but it also allows pauses for thought and reflection. Because they are not limited by

time, multimedia artworks can offer complexity and background, both visual and textual. They can deliver whatever it takes to achieve understanding. Producing sites on the World Wide Web allows me to combine my writing, filmmaking and multimedia work with both internal links (hyperfiction) and external links to other Websites. This allows me to expand the concept of appropriation indefinitely, into cyberspace.

Marianne .R.Petit - The Mutant Gene & Tainted Kool-Aid Sideshow CD-ROM

"The Mutant Gene & Tainted Kool-Aid Sideshow CD-ROM" (completed October 1995) is a navigable interpretation of a series of performances I staged in 1994, by the same name. The performances incorporated live and prerecorded, multiple-monitor and projected video, animation, text, both sequenced and live instrumental music, as well as the use of dramatic artifacts and performance elements such as masks and dance. Beginning with the psycho-dramatic confession of an extraterrestrial, the piece journeyed into a series of multicolored, entropic landscapes. My intent with the performances, and the use of technology was to create alternate or augmented realities for an audience. I wished for the audience to be immersed in an environment of sound, light and motion, which often paralleled the content - in essence, making certain fantasy states real. A complete written description of the performances was published in LEONARDO (The International Society for the Leonardo Arts, Sciences & Technology), The Special Virtual Reality Section, Volume 27, Issue 4. The CD-ROM emerged from a desire to break down the linear constraints of a performance to create a more personal "circular" experience, where an individual can explore the environment in any order, without being guided as a collective "audience" through various states. It was created on a Macintosh 660 AV, a Commodore Amiga 2000 and the equipment at the Experimental Television Center. It is entirely self-produced and self-published, and is available (for the Macintosh) through 1-800-WEIRDOS.

Patricia Piccinini - GMS

GMS is part of The Mutant Genome Project (TMGP), an ongoing project that deals with the effects, and prevailing authority, of medical technology in contemporary society. The work takes its impetus from the worldwide Human Genome Initiative which aims to map and document all human genetic material, with a view to being able to change it. The motivations behind this scientific research are entirely admirable; scientists working to rid the world of genetic disease. TMGP operates at the point where the rarefied world of altruistic genetic research meets the prosaic world of consumer medicine, where drug companies have to make a profit for their shareholders. TMGP asks the question - who makes the decisions and whose interests do these serve. In a world where every part of our superficial bodies can be surgically altered to conform to an increasingly global ideal, and where there is an imperative to provide the best for yourself and for your family, and where

the desire to fulfil these obligations are constantly exploited by advertising and the mass media; TMGP asks, "could genetic engineering become the cosmetic surgery of the future?" TMGP is fictitious bio-technology company that markets genetically engineered, 'designer babies' called LUMPs (Lifeforms with unevolved mutant properties) - supposedly the first prodigy of the Human Genome Initiative. LUMP is a cute lovable baby with six eyes and no legs; it is very intelligent and it is immune to all known diseases. LUMP represents the human body redesigned by an engineer for maximum efficiency with a high 'safety profile'. GMS, the proposed installation for ISEA96 takes the form of three large format, computer generated photographs and a Macintosh-based, interactive multimedia that emulates and critiques medical advertising and ideology. LUMP is seen as a pristine, 3D modelled form with the sort of beautiful, shiny surface that suits marketing objectives more than reality. The GMS interactive shows people what they would like to see rather than what they are actually buying; a fleshy mass with a cocktail of genes that might have unforeseen effects on our evolution. The interactive gives the user a sense that they are in control much like with any other computer game; selfconsciously oversimplifying the whole process, by reducing LUMP to an easily digested commodity with a price tag. This brings the whole 'interactive advertising' process to the surface. The viewer as a customer designs their ideal baby by choosing options in the same way one would choose a new car or a home loan (the interactive is based on laptop-based home loan simulators advertised on Australian television). In the installation, this cute and bloodless process is contrasted with a series of three 1.3 m square digital photographs depicting the visceral anatomies of the LUMPs. These almost Caravaggioesque images combine 3D renderings of dead LUMPs, dissected with anatomically accurate interiors rendered by hand directly into the computer via a pressure sensitive realities of 3D modelling with the speciously 'warm and fuzzy' techniques of traditional medical illustration. When the viewer sees the animation of their 'supposedly' perfect child contrasted with the dark realities of dissection, it is evident that while their creation supposedly satisfies all their desires and is certainly cute, it is not human - at least not as that term is currently understood. Animated LUMP may seem appealing but the idea is disturbing. However, TMGP is not good or bad - it's just there, and it may be a reality in the near future. The work can't afford to be moral about the issue of genetic research, because it is too important. What TMGP is really saying is that it is an issue too important to leave only for the medical scientific community to deal with it. We could be at the beginning of the most potentially revolutionary era in human 'being', potentially able to redesign ourselves, or our children, from scratch. TMGP wants nothing more than to be an ironic participant in the discussions that should take place.

EXHIBITION: VIDEO'S

Jordan Detev - The Virgin Panimnitos

My film is based upon historical sources from Bulgarian art. I have drawn upon the pure, traditional art of my country, expressed in thousands of icons created over the centuries. Their Biblical content has been developed into a direct participant in the action of the film. The script concerns the destiny of a motherless child. Its subject is the birth of a child, as seen through the eyes of one person. It seeks to convey very specific emotions, without personal sensation. In this way, the film functions as a testament - father to son, artist to public. In creating the film, I have also drawn on the methods of psychodrama. My appearance in the role of Madonna shows that a man can also love a child very much. The moment of physical death is fused with the role of the Saviour - but with a notebook in his arms rather than the Bible, the book of traditional knowledge. In that way the film's accent is on the human problems of a new world and change accomplished by reaching for knowledge and wisdom. As the text of the final song says, "When you are in a blind alley

Beaten down, boxed in by four walls

Make your own new way from all the cut-off paths

Be on the move again"

John Knecht - The possible fog of heaven

The Possible Fog of Heaven is a consideration of the dimensionality of metaphysics and the metaphysics of dimensionality. Elvis speaks for the first time from the after-life, describing in voice over and graphic text, his experience in Heaven. The Structure of the tape follows the King's last prescription.

John Knecht - 301 Nails....no air loss !!

301 Nails... is a continuation of a series of work which considers destiny. Set in a gambling casino, near a boxing ring next to the big church behind the race track. The protagonist and "Spider" duck weave their way through the day's events tempting fate with their own prophesies. They finally end up skipping town and head to the big game up in Mesmorosa only to come to a screeching halt.

Diego Lascano - Arde Gardel, Flight 101 To No Mans Land, Saint-Ex (abstract not available at time of printing)

Marcello Mercado - Remains of my mother

After they took away the dead body of my mother I made photocopies of everything that was around her. Medicines, electrocardiograms, the paper with her diagnosis of terminal cancer, prints, her praying book, her sewing case. Then I passed the photocopies on cells and made cartoons with them, a friend included stains. This video contains the remains of my mother: I'm floating on procaryote-eucaryote fluids. I'm evolving towards a ecosystem governed by microbes. I'm between the nucleation of water and a dead planet. I'm under a panespermic government. Even if my

belly boils, I prefer the cruelty of a coating of blood-hair-sperm.

Robin Noorde - Horses in the Air; VR Techniques In A Linear TV-Programme

Abstract: see poster session

Lise Jul Pedersen - CHANGES

"Changes" is a one-minute video about images, that change. To me computergraphics is all about that - changes. That you might and indeed can work with 10-100 different versions of a picture. Computergraphics give you the ability to change and work on your impulses with no risk whatsoever. The motifs are things that interest me. Pretty women that become strange and frightening creatures. Cats that become cat-flowers or dressed up in men's suits. Women's faces that are mixed with leaves of flowers so they appear to be beautiful - though a bit sad. The result is kind of strange - but pretty. Frightening but moving. I like the dark sides of human emotions, pictures that are both esthetically appealing as well as deeply disturbing. So that is what my video is: Kind of pretty, kind of disturbing. This is no real story-line in my video - it is simply based on the pleasure of looking. The simple pleasure of: not knowing that is going to happen next. Duration: 1 minute. Made on a AMIGA computer with Deluxe Paint and Digi Paint. Music by the danish composer Anne Linnet. Produced with support from Aarhus Filmworkshop - 1996.

Joran Rudi - When Timbre Comes Apart

The concept for this work is both musical and visual, and the following description will contain information relevant for both aesthetic domains. Knowledge from the natural sciences paired with computer technology has opened up new perspectives within the arts. It is now relatively easy to use cross-disciplinary mapping to display the same idea; the same data structure in several ways. The construction of this work is one of many possible mappings, and the animation is based on a direct representation of the data structure that comprises the music, one "sees" the music as one hears it. In addition to their art qualities, mappings like this can very well be considered pedagogic as well, as an entry into the current debate about musical representation. With the development of user interfaces that will allow the user to find his or her own visual way through the music, these kinds of mappings would share common borders with the VR field. Technically, the work has been realised first as music, and the piece was processed through an FFT analysis of the same type used to make sonograms. This was our preferred kind of analysis because of the visual results it yielded. The data set was then structured to make it available to the program used for the creation of the model that was later "filmed". The result is an experience of flying over/under/through the music as it is being played.

Yesi Maharaj Singh and Franz Fishnaller - Multimedia Book Project

The Multi Mega Book project is an electronic book sculpture composed of 24 mobile Maxi-Pages. At the top of the Maxi-Pages is placed a screen, on which the content of the 'virtual book: animated images, video, still images are projected. The MMB structure is 6 Mt. large, 3,70 Mt. high, 3 Mt. deep.

The Maxi-Pages are multimedial panels composed with fixed images and a map of interactive word-symbols. They have their own content, their function, their interactivity. The Maxi-Pages have integrated loudspeakers which allows for it's own sounds and music. The audio is composed of sounds and music which represents the diverse themes contained in the MMB. The Maxi-Pages are synchronized with the screen. They are different levels of interactivity between the images placed in the Maxi-Pages and the animated films projected on the screen.

Naoko Tosa, Ryohei Nakatsu - Interactive Virtual Drama: Body Communication Actor "MIC" & Poetic Communication Actress "MUSE"

For the abstract: see poster session

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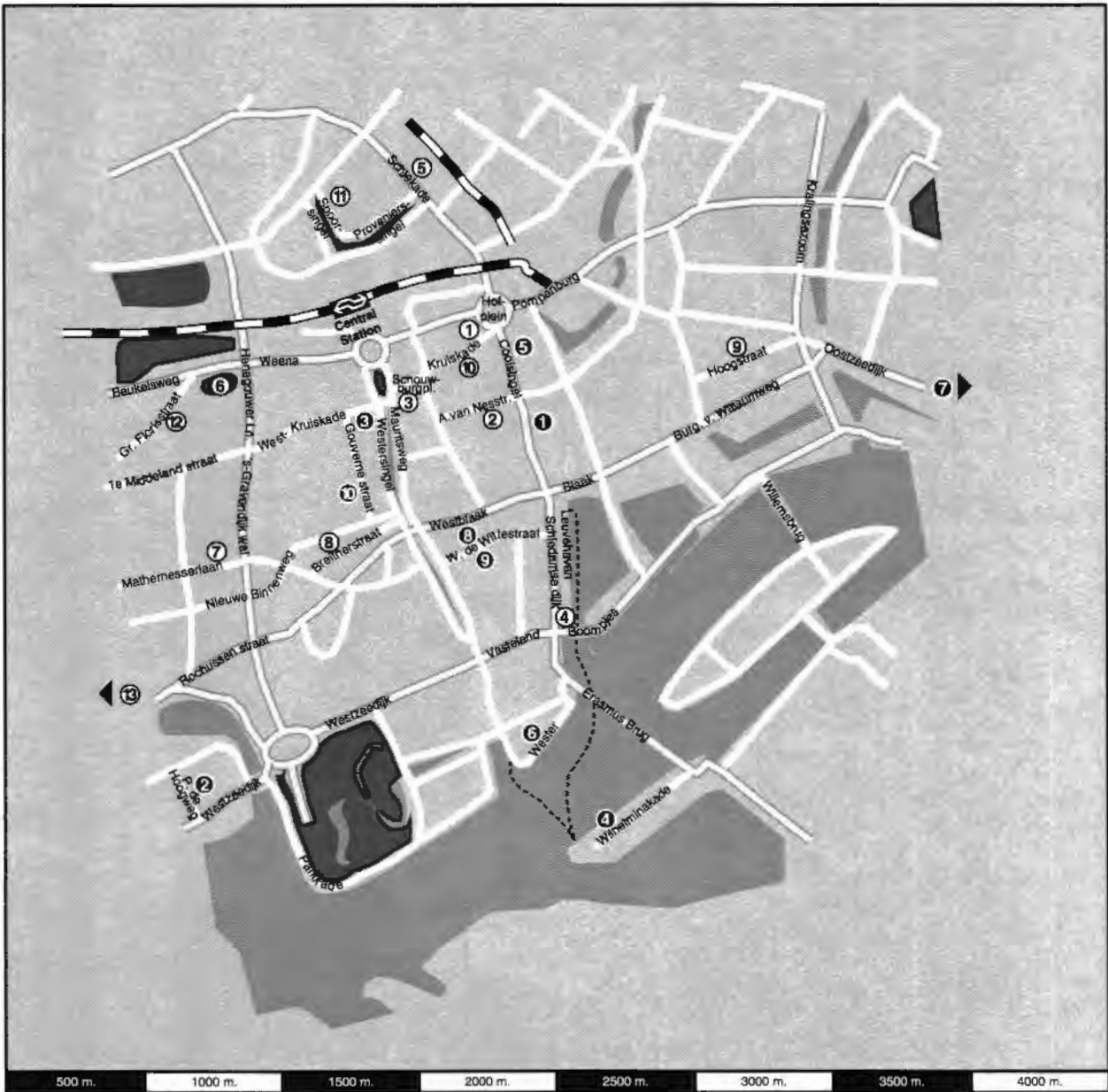
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Rotterdam - ISEA96 venues and hotels



Venues

- ① World Trade Center
- ② Conservatory
- ③ Kuub 3
- ④ Nighttown
- ⑤ Marine Safety
- ⑥ Townhall
- ⑦ Ethnological Museum (Museum van Land & Volkenkunde)
- ⑧ Erasmus University (Studium Generale)
- ⑨ Netherlands Photoinstitute
- ⑩ Witte de With Gallery
- ⑪ Lantaren/Venster Theater

Hotels

- ① Hilton
- ② Atlanta
- ③ Holiday Inn
- ④ Intel
- ⑤ Pax
- ⑥ Commerce
- ⑦ van Walsum
- ⑧ Breitner
- ⑨ Savoy
- ⑩ Central
- ⑪ Bienvenue
- ⑫ Floris
- ⑬ Baan