fourth international symposium on electronic art
Abstracts and Artist Statements

Minneapolis, Minnesota U.S.A.
November 3 – 7, 1993

Fourth International Symposium on Electronic Art

FISEA 93 is hosted by the Minneapolis College of Art and Design, in affiliation with the Inter-Society for the Electronic Arts.

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The struggle to accommodate the machine continues. Technologies. An unknown territory lies where emotional machines meet the human/machine hybrid. The "unsure-of-its-identity" body becomes the center of attention in art. Technology used to enhance the body also determines to some degree what the body should be (an object? a piece of equipment? an artwork?). Enabled by science, the artist's territory is expanding to the medium of life itself (artificial intelligence, Wetware, virtual worlds). The “Art Factor” is the focus of the symposium, with the merging of art and technology (the body/brain-body/brain) as a key topic for dialogue. The "Art Factor" may be interpreted as enhancing the technological interface with feeling, emotion, and other human qualities, and, at the same time, empowering artists with new tools.
This focus at the 1993 ISEA has been THE ART FACTOR. From the beginning the pro-
gram committee, recognizing that the claque of new technologies too easily takes center
stage, centered its interest on artistic procedures and information-processing by artists.
This "Call for Participation" identified the need for more focused dialogue on the immap-
ing electronic/media diatexit of films arts criticism. This new cultural frontier is changing
the way we experience and interact with our world. Clearly our "machine cul-
ture" will come to matter by mirroring, completing and integrating "art," both intext-
ually and qualitatively.

The artistic work of the cyber culture manifests itself as a new edge providing any art
text or criticism about itself. For this reason we see a need to draw those involved with
this new edge into a more focused sharing and discussion about their "art," both in theo-
dy and in practice. So FISEA '93 has been orchestrated to foster dialogue on the "art fact-
or" especially for those younger artists who have grown more with their minds than with
paint brushes. The intention has been to provide a greater understanding of both the for-
mal aspects of the work and its technology.

In keeping with our theme the "Call" explicitly invited work which the submitters consid-
ered to be "art," that perceived gesture to define "the art factor" through the window of
submissions. The very process of hundreds of artists, theoreticians and scientists profes-
sing the issues and preparing submissions would provide the substance for dialogue at
this symposium.

Why must we address the critical language and the criteria we use for the "art" of this
"machine culture"? One relation to each other, the world and the things we make is being
evolutionarily transformed: a "ubiquitous computing" invades our lives. This radical transforma-
tion includes deep-level changes in how we create and talk about cybernetic art.
From networks and form generations to genetic algorithms and computer viruses we see artists
using technologies that challenge assumptions about the "hand" of the artist, original art,
individual style and private expression. Shall we call "this" art? Where does it reside?

This ISEA series has been evolving terminology and formal categories for reviewing and
discussions, both public and private. Juries and committees make it possible to come
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ART/TECH COLLABORATIONS:
some tips on getting along

essay by BRENDA LAUREL

You have to fall in love. Not necessarily with each other, although that helps — but with a vision of what you are trying to do together.

Mistress of brushes, outputs physicist, basket biomimic — every artist's practice involves risk, knowledge, precision and curiosity. Painter of light, code composer, algorithmic alchemist — every technologist's practice involves beauty, harmony, intuition and protean transformations. We are more alike than we are different.

Somebody has to be on top. Like directing for theatre, the central task is creating the shared vision. Good guidance in visioning means getting people with vastly different skills to see pictures of the finished whole that converge as they work on it. First, agree on how it looks, tastes, feels. Then go away and apply individual expertise to describe how it is made. Come back and explain it to one another. Iterate.

Collaborative process and leadership are not mutually exclusive. Know when it is time to make a decision. Make it.

Bad communication will kill you — not listening to people with different expertise than yours, not bothering to translate your ideas into a common tongue, thinking you are a specialist, being secretive or territorial. The flipside: thinking it's not your business and holding your peace, avoiding conflict by avoiding communication, being afraid to ask stupid questions, waiting to express yourself until you're angry or alarmed.

The most important thing you will do together in the course of any project is to design tools. The technologist's tool seems indirect and arcane. What is he seeing when he uses it? The artist wants a capability that seems uncomfortably obscure. What kind of precision is she seeking?

Good tools will be there long after the piece is forgotten and the team is dissolved. They will influence the medium more strongly than any individual piece ever could. Good tools are the enduring fruit of successful collaborations.

THE PLACE IS ART

essay by JAN HOET

For a long time I have been sometimes fascinated and involved, but more often annoyed by the use of electronic media in art. The annoyance was such a frequent experience and reached such heights that I tended to refuse to enter into discussions about the place of electronic media as a whole. Rather, I engaged individual artists. "The place is art," I said. The basic reference for me remained the one to painting and its disposition to extend beyond itself. In Documenta quite a few of the referential pieces were actually videoworks. Their attitude was one of enveloping the observer rather than encountering him.

This period seems to be over for many of the areas of electronic possibilities, now legitimized areas in their own right. The glamour of the novelty is no longer the prime seductive adventure.
REDEFINING THE STATE OF THE ART

MARIO K. APOTYCOLES, P.H.D.

CREATIVITY AND COMPUTATION. TRACING ATTITUDES AND MOTIVES.
PETER METS

ART IN THE SOLAR AGE: THE solart global network 1995
JURGEN CLAUS

THE IMPLICATE BEAUTY OF THE ALGORITHM
BRIAN EVANS

FROM APPEARANCE TO APPARITION: communications and consciousness in the cybersphere
ROY ASCOTT

HOLOGRAPHY AND THE LANDSCAPE TRADITION
RENE PAUL BARILLEAUX

In painting, photography, installation and video, artists throughout the history have turned to the landscape and nature-based imagery as their source of inspiration, the material of their art itself. Now holography is another artistic medium being used to explore the connection between art and nature and as such proves interesting juxtapositions between technology-based art and nature.

The increasing visibility of this art, through exhibitions of the work of artists such as Rudie Berkhout, Susan Gamble and Michael Wenyon, is a critical step in broadening the knowledge and appreciation of the work both in terms of the general public and the art community.

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AESTHETICS OF A VIRTUAL WORLD
CAROL GIGLIOTTI, Ph.D

The aesthetics of interactive technologies, such as virtual reality, multimedia and telecommunications, inherently involve tough choices for artists and commitment to accepting responsibility for their impact. These choices entail the ability to sense and describe the dehumanizing metaphors already in place. Instead, reenvisioning the aesthetic of interaction in these intermedia should recognize and challenge these metaphors.

In making aesthetic choices artists have assumed certain ideas about the purposes and values of art making. Those assumptions have changed over time and have come from various sources both internal and external to the art making process, but they have had primary impact on what was communicated by the art and the art of any particular time.

With the emerging aesthetic of interactivity, artists face once more the need to recognize and reassess the intrinsic connections between aesthetics and ethics. Various theories of human interaction, such as Bion's and Brecht's, as well as contemporary social theories which encourage the development of an ethic of care and responsibility for others, may prove helpful. Connections between aspiration and ethics have held, and will continue to have great impact on how technology defines and is defined by culture.

ART IN THE AGE OF UBIQUITOUS COMPUTING
RICH GOLD

We are moving into a new technical age called "Ubiquitous Computing" in which there will be computers, sensors, and sensors embedded everywhere and invisibly throughout the environment. The big bulky thing with glowing screen and the hundreds of buttons that sits clumsily on your desk, currently called a computer, will disappear. Instead, your telephone, your car, your home, your car, white board, chair, mattress, refrigerator, toaster, trash can, and even the tools of art creation will all be computers, and just as importantly, they will all be talking with each other.

The highly sensitive, reactive and passive environment will certainly alter the way in which we work, play and think, and it will have an equally profound effect on art. Firstly, "Uh-Comp" will give artists a new palette of techniques and materials with which to create works. Artists of any culture make their art from the "mud of their own time" and we expect artists of the near future to be no different. Secondly, Uh-Comp will provide the viewers with new ways of seeing and hearing these works, as well as interacting with them. And finally, Uh-Comp will open a new area of artistic exploration. "Enspirited Reality," in which artists can determine the poetics of new objects and their visual attributes but also for their audible ones.

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TECHNOLOGY, ABSTRACTION AND KINETIC PAINTING
SAMIA A. HALARY

Institutional artist, work is included in many museum collections including the Metropolitan Museum in New York and The Chicago Art Institute. Video of computer work is in the Clark Library of the Museum of Modern Art in New York.

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New technologies bring new methods to abstract painting. Electronic methods interact with visual form resulting in a reawakening of concept, appreciation and criticism. This expands the audience for art as it expands artistic production.

Computing provides those methods in the author's current explorations:

1. Programming kinetic paintings with sound, in computer programs performed on a computer, provides new concepts of the picture plane as monitor and about the sequencing in time of abstract elements. Furthermore, it leads us to "look at" forms not only for their visual attributes but also for their audible ones.

2. Painting animation is simulated with video to record painting sessions. Watching week from a long painting session compressed into a video can touch the artist more than years of oil painting and criticism. This is an example by an artistic freedom because the expense and difficulty of mixing paints is removed.

3. Using interactive programming to automate the making of kinetic abstractions has produced the analysis of how artists use nature and reality as a source from which to extract general principles that they use in art. Conson, atmospheres, textures, types of objects, methods of abstraction or expression of shape, sequencing and rhythm, divisions of the picture's surface — all can be user-driven to create pictorial art which does not require manual drawing skills.

CONFIGURING HOSPITABLE SPACE
CRAIG HARRIS

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The Configurable Space project, a research project based on envisioning of future artists' work environments, examines the tools and processes that form the foundation for technological resources designed to support creative activities. It is directed towards the development of a balanced understanding about how we use the visual, aural, tactile and configurable capabilities of digital technologies, and how the tools develop affecting ways that we think, feel, formulate and develop on intellectual, spiritual and emotional planes.

Configurable Space environments incorporate any available technology that can be used to support the vision that the implied resources already exist. The simultaneous incorporation of interactive computer display tables, walls and holographic images, within a multi-dimensional sound environment, creates the constant for exploring relevant issues and for imagining how the space might be used in actual circumstances. The author provides a retrospective look at this project.

DETERMINISTIC CHAOS, ITERATIVE MODELS, DYNAMICAL SYSTEMS AND THEIR APPLICATION IN ALGORITHMIC COMPOSITION
MARTIN HERMAN, Ph.D.

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There has been a growing interest in and an increasingly wide application of dynamical mathematical models in the domain of electronic music composition and synthesis. Iterative fractal models and mathematical chaos algorithms provide fertile creative ground among composers and researchers.

Employing the research on algorithmic composition involving the application of mathematical methods that utilize "chaos" equations, the author has developed programs which use these models, non-linear mathematical feedback loops, to generate musical material. The programs have been implemented in MAX, an object-oriented graphical programming environment for computer music composition, on a Macintosh computer. With MAX the author can move into the area of computer assisted algorithmic composition; however, the composer's ear and musical judgement are not diminished in importance insofar as the final piece is concerned. To address this issue of human/machine interaction and the implications for computer assisted composition, the author displays the computer models which with one may interact in real time and which generate musical output in MIDI-based systems and plays examples from pieces which have developed from these models.
Are you engaged by the endless possibilities for image transformation using radically new tools? Do you describe your work in terms of pixel count or computer and software brand names? Is passive experience with outdated art forms no longer relevant to your work? Do you believe that by programming in pattern, meaning will necessarily follow? Do you think that anyone who agrees with George Bernard Shaw's statement that "Dysmorphology is the enemy of art" has never really appreciated the fine points of computer programming? Do you believe that Chaos theory combined with the power of digital computers can explain everything from the movement of subatomic particles to the organization of human consciousness with poetry pictures to prove it? Have you toyed yet of reading inside central nervous systems about how the digital revolution is being led by art reviews approximated of the lessons of art history?

The original language of electronic art and its emerging visual conventions have been the tested and deduced by perceptual and formalistic, visual and verbal clichés and formalistic representations. Many of these representations have become the essence of electronic media, aided by appropriation by commercial interests and wide dissemination through mass media. This has obscured and obscured discourse on content and aesthetics in technological art, especially within the mainstream art world.

The author provides an inventive examination of the emerging language of the electronic chic that teases 2-D to 3-D to transparency, and with reference to cultural influences of sexuality and gender, science and politics.

CELLULAR AUTOMATA MUSIC COMPOSITION: a bio-logical inspiration

EDUARDO RECK MIRANDA

Composer, musicologist, music expert, artificial intelligence and music researcher.

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Music has always been an interesting domain for the application of new scientific disciplines in electronic music composition. Today it is becoming increasingly common for the composer to turn to the sciences to supplement his or her compositional tools. The author is convinced that there are also powerful scientific methods that can be used extensively in the field of electronic music.

The motivation in promoting interdisciplinary activities between composers and scientists is twofold. On the one hand it is believed that scientific models carry an important component of human thought, namely formal abstraction, which can be very inspiring for musical composition. On the other hand questions are raised such as: "What can be the connection between understanding science as a compositional tool?" or, "Which aspects of music are applicable to music and how can it be done?" Obviously there are no simple answers to these questions. Each composer should be able to make his or her own judgements. As far as these questions are concerned, the work introduced by the author is to be regarded only as a contribution for experimental compositions.

The author has selected a class of mathematical models known as "cellular automata" (CA) to play the central role in this research due to the fact that they have been used to model a wide range of scientific phenomena. During the past three decades scientists have been investigating and developing CA. Although very simple they can provide models for a wide variety of complex phenomena in physics (eg. dynamic and chaotic systems), biology (eg. genetics) and chemistry (eg. chemical reactions and crystal growth). The author introduces an experimental system for cellular automata music composition called CAMUS (for Cellular Automata MUSic).
SCIENTISTS DOING ART, ARTISTS DOING SCIENCE

THOMAS HEATHER REAGAN

Standing on that imaginary ridge-top where the fields of art lie on one hand and those of science and mathematics on the other, the observer first notices the number of scientists, mathematicians and computer artists who cross the ridge and make contributions in the field of art.

These adventurers include both 20th century art pioneers who began in science-related fields before the age of electronic arts, and those who are using electronic means to bring their science-inspired musings into the realm of fine arts. We are particularly indebted to Frank Martha, space scientist and artist, who gave voice to those whose work involves both art and science by starting the journal Lumen, in 1966.

But the traffic over the edge is not one way. The observer in stock as well as the number of artists who, in the course of their work, have been drawn over the ridge into the technical realm. They make contributions in both art and science using electronic tools; they do science with an artist's mind.

It is time to pay tribute to the scientists and artists whose careers have taken them to both sides of the ridge-top. These are towering figures who deserve explicit recognition.

URBAN SITES INFORM SCULPTURAL LIGHT WORKS

LILIEN VON STARCH

We present a perspective that differs from many other contemporary writings on the aesthetics of computer graphics. The FFT/BUT is a powerful general purpose algorithm widely used in signal analysis. This FFT can be combined with the Iterative Fast Fourier Transform (IFFT) in order to characterize signals based on their behavior. This application of the FFT/BUT is of particular interest in electroacoustic music because it allows for a high degree of control of a given signal's spectral information (timbre) allowing for feasible and efficient implementation of signal processing algorithms.

The authors present real-time musical applications using the IRCAM Signal Processing Workstation (SPW) (Lindebauer, et al, 1985) which makes use of FFT-based compositing for tonal transformations in a compositional context. A user interface, developed by the authors in the MAC programming environment (Puckette, 1988), is used to demonstrate the subject. Examples include voicings, cross synthesis, dynamic spectrum shaping, frequency domain equalization. The focus is on these transformations and their control through parameters of the composer's point of view.

CREATIVE PROBLEM SOLVING AS AESTHETIC EXPERIENCE

GREGG K. SHORES

While all art involves an interaction of the viewer with an object as an event, interactive art makes explicit this idea and requires the viewers to become behaviorally involved with the work. It is in contrast to the more detached contemplation often associated with the aesthetic experience. In the author's work, viewers activate pianomata or other sensors which, through a computer interface, change the auditory or visual environment for the viewer. This environment is the art object, while the set of elements involved in the interaction is the art work.

In this context, the viewer exercises creativity and problem solving which becomes part of the art work itself. We can understand these phenomena in terms of the theories of problem solving and creativity, using the author's work to illustrate it is necessary to expand our understanding of the aesthetic experience to include problem solving behavior. And, electronic media have a special role to play in this expansion of the meaning of art.

QUALITATIVE, DIALECTICAL AND EXPERIENTIAL DOMAINS OF ELECTRONIC ART

REJANE EHFITZ

Electronic art is showing, however, that these complementary approaches can be combined: artists and technologists may blend their different perceptions and knowledge in order to enable the construction of a quantitative, dialectical and experiential electronic expression language. In which visual, social, cultural and economic disciplines, maintaining a balance between uniqueness and uniformity seems to be the contemporary electronic artist's major struggle.
The ELECTRONIC GARDEN

THE COMPUTER AS A TOOL FOR SCULPTORS: sculpture in cyberspace

FISEA '93 Symposium Panels

The ELECTRONIC GARDEN is a cyberspace environmental sculpture created by the author and exhibited as part of the Computer Graphics at Chalmers Fall, New York in the winter of 1980-83. It is composed of nine reenacting "plants" each consisting of a cluster of "flora" with the tallest being about human height. The Garde is activated by sound and spectators are encouraged to walk, run, talk or even play a musical instrument.

The roots of this garden go back to the author's early contacts with Experiments in Art and Technology (EAT) to New York City, and his subsequent collaboration with an engineer, stimulating his interest in emerging art and technology. Sociopolitical and artistic influences include the work of such historic figures as Hieronymus Bosch, Leonardo da Vinci, Claude Monet and Georgia O'Keefe. The philosophical significance of The Electronic Garden owes much to the writings of Aron Schoenstein, Walter Benjamin and Carl von Linneweber.

The Garde began as part of a youthful desire to employ technology for peaceful purposes. Over the years it has gained additional meanings. The Garde is a Bagdad image of the natural world in the cybernetic age, a natural world that we now know is also very fragile. In this sense, the Garde is a faint reminder of what we stand to lose unless we listen for more carefully to nature's feedback and improve our present wasteful stewardship. But feedback alone — empirical and scientific — is not enough. We must also be aware of "feedbackers" — Dudley Young — intuitive and magickal. The Garde is also, as are all gardens, a place where spirits come and go, where image strikes and connects with the mythic.

LIGHT AND DARK VISIONS: the relationship of cultural theory to art that uses emerging technologies

STEFANIE LUCAS

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The impact of technology on contemporary life and culture is a vital issue in our age. Critical theory and cultural studies attempt to link the arts, literature, politics, sociology, anthropology, philosophy and technology in an interdisciplinary research for relevant concepts and frameworks with which to understand the current world. Art practice and theory are being radically changed by this activity. This hybrid world of culture/art criticism, which plans great impact on the impact of emerging technologies, has seen unprecedented unification in the work of artists who work with these very technologies. Similarly, the disciplines in the cybernetics world — and in the terrestrial world in general — has not engaged deeply the concepts from cultural studies. What response underlies this mutual lack of interest?

Critical theory and cultural studies offer compelling tools for understanding some aspects of contemporary technological society. However, useful work can only be done if the really significant questions are asked. These questions are problematic for envisioning what might be. In this sense, they pose significant challenges for the artist. How should artists conceptualize their work? What new technologies are "naturalized" into culture. The exponentially accelerating speed of technological change leads us to question whether there is a maximum speed of cultural adaptation. Consider the paradoxes of copyright that copyright law is dealing with in the presence of new technologies. The mechanisms of cultural adaptation are slipping behind.

Despite the apocalyptic overtones, this is a very practical problem for artists in electronic media. Over the last twenty years we have seen short eras of technological art practice. Accepting the premise that technology is a "black box," that any technological tool has no transcendental function, critical judgments are required to assess the artistry. Some artists have employed traditional methods of exposure through the museum/gallery system. Telecommunication Art events have sought to open new means of exposure through the museum/gallery system. Telecommunication Art events have sought to open new means of exposure through the museum/gallery system.

Artists who work with emerging technologies are faced with the challenge of positioning themselves in these conflicting world views.
THE ART FACTOR:  
INTERNATIONAL EXHIBITION  
OF ELECTRONIC ART  
October 29 to December 16, 1993

More than a year ago, planners for FISEA 93 aptly chose "The Art Factor" as the theme for this symposium. It is an appropriate theme because, for the first time, this event is being hosted by an art college - a place where new art forms are being discussed and can emerge. Moreover, it is appropriate because it is my belief that now is the time to emphasize the artistic over the technological aspect of this relatively young art form. Only if practitioners of electronic art have an understanding of both the history of art and contemporary aesthetics - with all its richness and diversity - will their art achieve its greatest potential as being the leading art form in the next century.

The Art Factor: International Exhibition of Electronic Art surveys the broad range of applications in electronic art today. While far from conclusive - large-scale installations and environmental pieces could not be included, for example - this exhibition establishes a solid foundation for the viewer. Like the technology in which it is based, computer generated art is sure to grow rapidly. Modern art has had a love/hate relationship with technology, at one moment embracing it as a panacea and the next rejecting it as a cause for all that is wrong in society. Nevertheless, the computer and its related technologies will take their place among the fundamental tools for making art.

More than 120 applications were received for this exhibition with 46 artists finally invited to participate. I'd like to thank the jurors Jim Dozier, independent curator and Judith Yourman, visual artist and Assistant Professor of Electronic Media, St. Olaf College, for their hard work in selecting this outstanding group of participants. Additional thanks go to Lisa Daehlin, gallery assistant; Anastasia Faunce, public relations; Bradford Smith, media center; Lars Mason, building services; and to the exhibition crew. Finally, I am grateful to the artists themselves for their cooperation and good humor throughout the entire process. My deepest gratitude goes to Roman Verostko for inviting me to participate in this project. It has been a rewarding experience indeed.

Brian Szott, chair, exhibition
The extended scanning system of capturing provides a look at these aspects of illuminated objects. Using numbers (20 to 500) light sources, I am sweeping the scenes, Taylor-Shack, which renders images of light integration. In the algorithm, lighted regions can be easily transferred to shade and vice versa by parameter manipulation.

The potential of computer as an image generator meets my creative interests in the realization of images we can not see in the actual world.

STEVE BRADLEY

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I consider myself to be a trans-media artist or generalist. I consent systems of cultural computerography via media to academia as an analytical and artistic electronic narrative. I have been conditioned by the media culture in television (media) easily serves as my electronic landscape. The computer serves as the primary tool by which I link all my tools including sound, imaging and varied commercial software. By digesting, manipulating and re-creating the electronic images of media, I am illuminating how “propaganda is to
to share my outrage and sense of absurdity to effect some point of awareness in the vast

Annovitz’ work composites his own photography with 3-D computer generated models and digital painting. He utilizes a variety of software running on both the IBM and Macintosh. The final images are output via a film recorder as transparencies or as archived films or gel plates on Arches watercolor paper.

The computer, as a medium, is for the artist a kind of hybrid of painting and sculpture. Virtual objects can be built and moved as we do in a real space. This “manipulated” image is expressly textured, Kit or metamorphosed. The work has been described as a visual simulacrum of “terrifying cybernetic procedurally automatic sandwiches.” That is to say, there is an intent to make visible the momentary crystallization of “localized psychic energy networks” which exist in non-parallel association with people and their environment. These networks are usually represented by the interweave or overlay of geometric abstraction such as mathematical polynomial nets or spherical planar arrays on the late 20th century gone scenes.

PAUL BADGER

Independent artist
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As an artist, educator and communicator I am interested in mixed media, multi-disciplinary investigations using computer, photography and painting techniques. The computer has a non linear nature that can access, assimilate and manipulate visual data, which reveals images of Light integration. In the algorithm, lighted regions can be easily transferred to shade and vice versa by parameter manipulation.

ROMEU BESSA

Artist, University of Florida, Gainesville/Gainesville
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I am a painter. Although, since 1987 I have been imaging computer with computers as well. I use the computer as a medium in the same way that so a painter I use my brushes and my oil paints. I am fascinated by the similarities not by the differences between the two media, computer graphics and oil painting. I like to use the motes knowledge that the image on the screen is a “translation” of the movements of my hand. This “translation” is the result of digital codes being processed by a machine. Oil painting, by contrast, is the movement of the brush in my hand carrying the paint on the canvas. The investigation of this ontological difference is at the core of my work.

The visual complexity of my computer images is directly related to my painting. Whereas painting has no origins in the beginning of imaging (sometimes in veins), computer images point to a new kind of communication in a new kind of space. As the dark hole of the cave becomes the vision of a particular age, so the black box of the computer stores the images of a new time. Cyberspace — a model over.