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INTRODUCTION

< This issue >

Craig Harris

LEA 4-3 has a profile of the WWW site CHAINS, a fascinating project of cultural interaction connecting Ghana with NYC and the world through the WWW. The creators of this project and site provide us with a hypermedia survey, complete with links to various aspects of their WWW site. Roy Ascott provides us with a profile of a recent gathering at CAiiA, including abstracts of presenters.

Leonardo Digital Reviews is quite thought provoking, and includes a book review by Roger Malina, an exhibition review by Sonya Rapoport, and an exhibition review by Edward Shanken. In Publications this month there is a new World Wide Web music journal, spearheaded by computer music pioneer David Cope. And Curtis Roads has completed his 1234-page tome "The Computer Music Tutorial". Curtis is another key pioneer in the computer music realm, and has been working on this book for many years. It is destined to become a definitive tutorial.

There were many announcements this month with imminent deadlines, indicating the intensity of activity around the world. Also with a close deadline is the opening for an Institute Director at the German National Research Center for Information Technology (GMD). If you are interested in this position, act quickly!

I apologize for some file name errors in Tania Fraga's web perspective in the LEA Gallery. These have been repaired, and gallery visitors should have no further difficulty.

Stewart Dickson wrote with notification about a change in his web site. While some of the interactive materials at his site will no longer be available, his mirror site is worth a visit.

Thanks to all of you who have been in touch with me regarding submitting material for LEA. New submission guidelines are available on the LEA WWW site, and I am happy to send them via email to anybody with limited access to the WWW.

< Letters >

Stewart Dickson
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Dear MathArt Visitors, Hot-Linkers and Correspondents:

Some of you may have noticed that <http://www.mathart.com> has

become available less and less often. I have had to cut back my connection time.

My primary Web site, with interactive applications, will disappear altogether in two days. Bell Atlantic is shutting off my ISDN line. The mirror site, <http://www.wolfram.com/~mathart> will remain. It has the front-ends to the interactive works, but the buttons will return "not found".

I am sorry for any inconvenience this will cause. I hope at some point that the site will return.

In the meantime, e-mail for me should be directed to <pix@wri.com>

Thank you.

-Stewart Dickson

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< An Annotated 'Coded Messages: CHAINS' -
Cultural Ecology from Ghana to the World Wide Web >

Melissa Lang and Andruid Kerne
Creative Media Cauldron & amp
NYU Center for Digital Multimedia

Contents:

- Cultural Ecology
- Coded Messages
- CHAINS
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- Resources

A note on navigation: Netscape 1.1 or higher is required to enjoy the complete design. Additionally, you will need helper applications in order to hear the sound files, and view the Quicktime movies. We have a help page set up to help you get your machine properly configured. The links we have set up in the LEA profile go to the actual site. To return to this article use the Back button on your browser.

The Doorway stands between the dungeon and the light. A figure stands poised, ready to cross the boundary. Thus begins your journey through the web site, Coded Messages: CHAINS. The CHAINS site is one product of our own journey to Ghana in 1994, a testimonial to our study and collaboration with traditional drummers and dancers there.

We didn't go to Ghana just to collect sounds or conduct anthropological research, though we did do this to some extent. Our main intention was to interact with the people, to establish relationships with them, to share an understanding about our different ways of life. Our desire was to provoke ourselves and our fellow human beings into new experience and new perspective. We went to Ghana to exchange creative energies in a common cultural ecology.

Our work is about moving between contexts and boundaries. We challenge the separation of disciplines and strive to forge connections between cultures. This web site joins the spaces

between tradition and technology. As we walk you through the site, take time to find new connections in what we present. Challenge our perspective. Find your place in context. We are offering one of the many possible routes through the CHAINS site. It is not the only way, nor the right way. Our discussion will present a mix of the nuts and bolts of designing and constructing this site, and an explanation about the content.

Cultural Ecology-----

The etymology of 'ecology' derives from the Greek oikos, or house, and logia, a systematic treatment, which in turn comes from logos -- word, reason, discourse. Ecology is about interrelationship, about flows of energy and resources among component entities which interact in a larger whole. In the late 20th century, the ongoing development of multinational capitalism has achieved absolute hegemony: all resources and all people on this earth are subjects of the system. All human experience is mediated by the undeniable power of that center.

The etymology of 'culture' hails from the Latin, colere, to attend to. Early uses refer to cultivation, the tending of natural growth, and to the divine worship of spirits. The word's association with natural development was gradually replaced with human development. We use the word cultural to describe a human response to the environment. How do people adapt to the conditions of the 20th century? What outlets for expression can we imagine that lie outside the forces of production? How are our relationships with each other affected by the pull of the center?

The center wields both obvious and invisible power. We find this invisibility in everything accepted as normal. By hiding behind the mask of normalcy, the center never has to explicitly define itself. What is normal is highlighted. Implicit rules of exclusion draw borders between the center and the margins. Difference is treated with contempt and disdain, exoticized and trivialized. Oppression is practiced and internalized.

A movement among people who identify themselves as marginal names and reclaims this status. Their resistance brings dignity to a denied perspective, a patchwork identity composed of tradition, assimilation, and subjugation. bell hooks writes,

"Our survival depended on an ongoing public awareness of the separation between margin and center; This sense of wholeness, impressed upon our consciousness by the structure of our daily lives, provided us an oppositional world view - a mode of seeing, unknown to most of our oppressors, that sustained us, aided us in our struggle to transcend poverty and despair, strengthened our sense of self and our solidarity."

This perspective inspires us in forming a strategy for respectful participation in intercultural work, which simultaneously engages the traditions of others, and seeks to draw out and heal the schisms inside and between ourselves.

After years of traversing boundaries between cultures and transgressing boundaries between disciplines, we feel a need to identify the generating principles of how we work to make culture. We combine "colere" and "oikos" to form "cultural ecology", a world view of creative work. For us, art and technology are a single process. Theory and practice are only interesting in their conjunction. In all creative acts, the impetus of joy and the

drive to solve problems co-mingle. The realities of postmodern multinational capitalism confront us daily, like a Sisyphusan grindstone. We do not wish these factors to deny our growth as human beings, or our development and self-determination as people. As artists, activists, technologists, we face these realities head-on to reclaim our personhood by identifying unity, and placing elements in interrelationship, thus developing cultural ecology.

We are disposed towards "logos"- discourse, without embracing "logia", - systematic knowledge. Our discourse plays with systematic knowledge, so as to subvert it as much as to establish it. Our motivation as cultural ecologizers is to create interesting perturbances in the normal goings-on which cause participants to think about and feel our common alienation and interconnectedness.

Coded Messages-----

Coded Messages is our name for a series of performances and installations which juxtapose hidden meanings from disparate semiotic systems in order to illuminate new interpretations and meanings. These systems are the "vu gbe", or drum language of the Ewe people in Ghana, wherein texts are encoded in the melodies of drummers, and the commercials of American advertising, in which layered messages about social norms are conveyed.

Vu Gbe - Drum Language

Among the Ewe of Southern Ghana, a legendary metaphor, 'Ela kuku dea be vu la gbagbe', which means 'A dead animal screams louder than a live one,' is commonly used to explain the human experience that inspired the origin of the drum - a super voice surrogate was built out of the skin of a dead animal that could deliver the message louder and clearer. (C.K. Ladzekpo)

In traditional Ghanaian performance, interactions between participants, media, and content, are often initiated by the call of a drum. Speech surrogates are forms of cultural expression in which non-verbal aural units substitute for speech, just as written phonemes correspond with spoken ones. Thomas Sebeok and Donna-Jean Umiker write that a pair of semiotic systems may be "substitutive systems, such as...drum and whistle surrogates ... which are dependent on spoken language to such an extent that persons wishing to use them must share a common base language if they are to make themselves understood." (1)

Substitutive systems "instigate a particular process of transmutation, or intersemiotic translation, which is the 'interpretation of verbal signs by means of signs of nonverbal sign systems' ." (2)

This process corresponds to J.H. Kwabena Nketia's "speech mode of drumming" (3). The listener who understands the base language identifies key features in the drumming, transmutes them into their base language signifiers, and comprehends these as speech. Drum language is a speech surrogate form practiced by the Asante and Ewe peoples of Ghana. Composers often use drum language to represent proverbs. In Ghanaian society, proverbs are the form in which deep philosophy is represented in everyday language for the on-going transmission of world-view. Over time, the Ghanaians have developed a rich medium in the form of music, movement and design, precisely integrated with each other to represent encodings of proverbial statements. Proverbial symbols can be found in the traditional arts: in the patterns woven into kente cloth, on the

stools people sit on, in the interlocking rhythms of drummers and in the movements dancers make. The message of each proverb becomes reinforced through its encoding and presence in multiple forms. The forms converge in traditional multimedia when participatory rituals are enacted.

Recontextualizing semiotic encodings became a mainstay of Coded Messages: CHAINS. For our costumes we went to Makola market in Accra to choose cloth with appropriate meaning. The pattern "Mensu bio" was chosen for a number of reasons. First was the image, which reminded us of interlocking links of chain. Second, "Me nsu bio" is translated from Twi to mean "I will weep no more," symbolizing a transformation from despair to hope. Regarding "vu gbe", it is important to realize that not all Ewe people understand this drum language. Few other Ghanaians can understand the base language, Ewe, so they are excluded from comprehending Ewe drum language. Often it is just the drummers who understand what is being played. Sometimes they share internal jokes, playing catchy phrases for each other's amusement. Again the questions: "Who is speaking? Who is being spoken to?" are raised. When we brought the performance to Anyako, which is an Ewe village, Francis played drum language and then spoke the meaning. As you can see from the video clip, the audience reveled in the secret joke he shared with them.

Commercials -Nante

The second stream of semiotic encodings came from advertisements in American magazines. After looking over the ads we began to notice similarities:

Most of the people portrayed were Caucasian. None of the signs of poverty that were omnipresent in Ghana were represented. None of the slogans directly mentioned the product being sold.

In these ads we meet the center. The pictures represent a fabricated world of prosperity, health, and contentment with a code of signs. The realities of the associated degradation are invisible. Everything contrary to this illusion disappears. This absence forms a crucial clue to the Coded Messages. The ads suggest that if you don't look or live like the people in the ads you don't exist. Furthermore, owning the products is a prerequisite for this existence. A group of the performers moved among postures from the advertisements and chanted the matching slogans upon command.

CHAINS-----

Coded Messages: CHAINS was built with drum language passages from two important pieces in the Ewe repertoire; "Gadzo" and "Adzogbo" are pieces which have historical significance. Both have been used to arouse community support and cooperation in times of hardship and threatening circumstances. C.K. Ladzekpo, Professor of Music at U.C. Berkeley steered us to explore the "vu gbe" for Adzogbo.

The interpretation of one passage of Adzogbo became the heart and the namesake of Coded Messages: CHAINS.

(Ewe words)

Dza dza, dza dza, dza dza, dza dza,
Avalokoe le ko na mi.
Dza dza, dza dza, dza dza, dza dza,
Avalokoe le ko na mi.

Me nyi ba na huto,

Me nyi ba na hesino.
Avalokoe le ko na mi,
Me nyi ba na huto,
Me nyi ba na hesino.
Avalokoe le ko na mi,

(English translation)

Our necks, our necks, our necks, our necks,
Chain will strangle without release.
Our hearts, our minds, our heads, our necks,
Chain will strangle without release.

Listen to the drummer,
Listen to your own song.
Chain will strangle without release.
Listen to the singer,
Listen to your own song.
Chain will strangle without release.

"Our necks" is the foundation of CHAINS, the recurrent reference, and the thread of continuity. It appears in many forms: spoken, enacted, drummed, and danced; interpreted and reinterpreted. You can find it stated in different languages on the vu gbe page. On the whip page, you can find a more literal enactment.

Andruid Kerne created this total translation in consultation with Francis Kofi, C.K. Ladzekpo, and Gustav Hlomatsi. The passage, in its traditional context, served to incite the people to respond to a clear and present danger. Now, we are connected by chains, and bound, all of us, to the center. "CHAINS" became a linkage and a symbol, a rallying cry among the performers. Where "Coded Messages" is an abstraction, "CHAINS", is tangible, connecting the pain of history with the pain of the continuing, postcolonial relegation of Ghana to the margins of the global economy.

The Internet is also a medium of connection, playing a role in the cultural ecology to circulate information among those who are lucky enough to be connected. The whole peoples who are excluded are left relatively poorer than those with access. Thus the Internet functions as new chain of exclusion, binding those with access into a web of connectivity, and leaving the rest bound in silence. Owning the technology of information -- telephones, televisions, computers - is a dream for many people we met in Ghana. This is the subject of "Tele", where Francis chants "Chains of cybernet economy", "Power Money Power Money", and "NBC, ABC BBC, GBC, CNN, IBM", interlocking cross-rhythmically with the other performers, who chant, "Telephone Television Telephone Television" in a call and response form.

CHAINS Representation-----

Throughout the production process, we asked ourselves Trinh T.'s key questions: "Who is speaking? Who is being spoken to?". They are fundamental questions which one must ask about any intercultural exchange. We feel ourselves pulled to the center even though we try to transcend the boundaries. Our access to this technology puts us in a position of privilege. Though we like to think that our colleagues and friends in Ghana appreciate this rendition, most will probably never get to experience it. We acknowledge the irony of this project, for, while we believe we are serving their interests by presenting their culture to an international audience of thousands, they can never see this representation themselves. We seek an ethical ecology of technology, with equal access for all. Master artists from all

cultures deserve to have the tools in their hands and education in the associated knowledge. Until, or unless, we are able to achieve such an exchange, we bring their cultural expressions to a medium which excludes them as subjects and even more so, from access.

What is signified by the code, "World Wide Web"? We include a link to a site, "The Virtual Tourist", which features maps of Internet access throughout the world. When we first found this map on the web in June 1995, the only African country with Internet access was South Africa. The rest of the continent was an unidentified expanse of yellow. This resonated deeply with the lines written by Andruid and chanted by Francis in the piece "Tele":

"Superhighway? We got no trunk lines here. You can't reach me, I got no telephone."

The "World Wide Web" presents as skewed a map of shared culture as the map from 1200A.D., in which a thick circular boundary is drawn around the known Christian world, and the space outside of it is empty. Christ stands above, and monsters patrol the borders. Nine months later, while preparing this article, we return to the Virtual Tourist map and the change is minimal: Cote d' Ivoire, Ghana and Benin are now filled in (with sites we have not been able to connect to), as are a few countries in East Africa. A disproportionate number of countries remain blank.

CHAINS Techniques-----

Amidst cultural ecology, we identify the "ecology of technology" as an inquiry into the arts and sciences. Technology blends "logos", with the ancient Greek, "techne", art or craft. The Greeks systematized art and craft; only during the industrial revolution was technology wrought to mean the practical application of science in the process of production. In our work we apply the same principles to creative and technical processes. We unify the processes which are otherwise bifurcated into art and engineering.

Guerilla Links and Random Walks

Authoring for the World Wide Web has opened a new realm of possibilities for creative and subversive expression. Site designers have access to almost all the source material that's published on the Web. In the spirit of "Ready-Mades" we can link to sound files, images or even movies that exist outside our site and bring them into our context.

In Coded Messages: CHAINS we use "guerilla links" to force the context of multinationals to meet ours. Brought into unfamiliar surroundings, their coded messages gain a clarity that is intended to remain invisible. We juxtapose contexts to bring out new meanings. another right next to it jumps to the actual AT&T ad that they are quoting. As we scan the ad copy, we know that the "You" most certainly is not our friends in Ghana. The command "You will" echos the commands shouted out to the performers during the Nante section.

Elsewhere, on the Coded Messages page, find an imagemap collage, and the instructions, "Click around to find the different codes." In the foreground of the collage are pictures of CHAINS images. Clicking on the background will invoke our randomWalks CGI script. This script chooses randomly from a set of corporate links we have assembled. The guerilla links jump to sites such as Lockheed, and Dupont, each promoting their vision of a perfect world. In our collage, the presence of the center is invisible. Our resistance

is highlighted.

Graffiti Wall

Participation is a hallmark of cultural events in Ghana. When a drumming society performs in a village, everyone is invited, and everyone is encouraged to join in singing and dancing. The CHAINS Graffiti Wall brings this sensibility to the site. A script generates a self-modifying HTML page, to which the participant-user can add text, image links, and hyper links, through a form.

Annotated Coded Messages: CHAINS Resources

Cultural Ecology:

hooks, bell. marginality as site of resistance, in *Out There: Marginalization and Contemporary Cultures*. Edited by Russell Ferguson, Martha Gever, Trinh T. Minh-ha, Cornel West. New York: The New Museum of Contemporary Art. 1990. p. 341.

Coded Messages:

Sebeok, Thomas, and Umiker-Sebeok, Donna-Jean. *Speech Surrogates: Drum and Whistle Systems*. The Hague: Mouton. 1976. p. xiii.

Jakobson, Roman. *Language in Relation to Other Communication Systems*, (1970: 261), quoted in Sebeok and Umiker-Sebeok, op cit., p. xiv.

Nketia, J.H. Kwabena. *Drumming in Akan Communities of Ghana*. New York. Thomas Nelson and Sons. 1963. P. 28.

Acknowledgements-----

We would like to thank:

+ our co-director, choreographer, and master drummer, Francis Kofi, for his inspired participation and valuable contribution. The performers: Felicia Adeti, Aborchie Etse, Faustina Nyanovar, Martin Kofi Gademey and Blaise Ketsri for being open to working in foreign ways.

+ Carla Peterson, and the Suitcase Fund: A Project of Ideas and Means in Cross-Cultural Artist Relations, an initiative of Dance Theatre Workshop in New York City, with major funding from The Rockefeller Foundation, for funding the performances.

+ Professor J.H. Kwabena Nketia, International Centre for African Music and Dance, University of Ghana, for his wonderful hospitality, support, and ideas.

+ Professor C.K. Ladzekpo, Professor of Music, University of California at Berkeley, for opening the first doors, and continuing to give inspiration, especially here with translations and interpretations of his tradition.

+ Gustav Hlomatsi, Chief Ewe Translator at the Bureau of Ghana Languages.

+ Joe Ladzekpo "tsiami" of Anyako, for his hospitality in all our visits, and for making us welcome to import this performance.

+ Bless Dzikunu, our translator in Anyako.

+ John Darkey, Director of the PANAFEST Secretariat.

+ Ken Perlin, Director of the NYU Center for Digital Multimedia, and the C4DM, for hosting Coded Messages: CHAINS on the web.

+ Noah-Wardrip Fruin of the NYU C4DM, for beta testing early versions of the site.

+ Jon McKenzie for editorial advice.

+ Craig Harris for inviting us to Leonardo Electronic Almanac.

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< CAiiA Research Conference >

Roy Ascott

Centre for Advanced Inquiry in the Interactive Arts

Newport School of Art & Design

University of Wales College, Newport

Email: 100143.100@compuserve.com

URL: <http://caiiamind.nsad.gwent.ac.uk>

CAiiA is devoted to research in the practice and theory of Interactive Art. Researchers are either "onsite" based permanently at CAiiA, or "online" networking from their own country and travelling to CAiiA for three ten day intensive sessions in Spring, Summer and Winter of each year. Each one is pursuing CAiiA's three year doctoral programme leading to the University of Wales PhD. This conference was the first in a series presenting the wide range of issues addressed by current doctoral candidates, and an opportunity to discuss the innovative nature of the programme and the creative interactions of this unique high-level research community. The second CAiiA conference, including invited and refereed papers, will take place in November 1996, information will shortly be posted on the caiiamind website.

The Conference took place on 15 March 1996, and was convened by Roy Ascott, Director of CAiiA and Supervisor of the research projects, and included:

- + Joseph Nechvatal: "Traditional Culture and Cyberculture: the impact of electronic communications on the imagination in contemporary art"
- + Gillian Hunt: "Sensitive Architecture: the role of smart materials in re-sensitising the man-made environment"
- + Dew Harrison: "Hypermedia and the Creation of Concept based Art";
- + Barbara Rauch: "Dream states / Web sites"
- + Miroslaw Rogala: "Hand versus Body: interactive multimedia space"
- + Bill Seaman, "Recombinant Poetics - Navigation, Construction, Virtual Behaviours, and 'Re-Embodied Intelligence' In Interactive Art"
- + Victoria Vesna, "OPSEES - Online Public Spaces: epistemological explorations of site"
- + Frederic Nantois (doctoral candidate at the University of Paris VIII), "The City as Hypertext-space in Real Time".

A selection of conference abstracts and bios of the presenters follows:

Joseph Nechvatal:

Email: jnech@imaginet.fr

URL: <http://www.dom.de/arts/artists/jnech/>

Research title: "Traditional Culture And Cyberculture: The Metaphysical Impact Of Electronic Communications On Art And Literature". (the intersubjective interface between computer assisted artistic production & pre-computer culture)

In this undertaking I will ask the interactivity and immersion questions. I will research the changes in the metaphysical identity of the individual (artist) vs the collective collaborative group situation and HIGHLIGHT THE INTERSUBJECTIVE CHARACTER OF MEDIA ART COMMUNICATIONS. I plan to put an emphasis on an analysis of the interpretive function of the negativity of rebellious subjectivity as a tool for the struggle for a freer and fuller psychic and aesthetic existence in light of some of the

evils of our age: relentless competition, wasteful productivity, deceitful repression, false power and mass-minded cynical brutality. A driving force of my criticisms, contradictions and contestations will be to ask myself and others to what extent the conquests we are achieving over external nature through high-technology are enslaving the internal natures and sensualities of artists (and by implication society) and to what extent they free the imagination and enhance sensuality. To what extent are immersion technologies a negation of suffering, a negation of alienation in labor and culture. How do they impact our love relationships. I will ask difficult questions about how the old analogue world of literature, art and philosophy deals with the "New World" of technology and visa versa, and how this dialectic is defined - (Perhaps it is a falsely exaggerated dichotomy?). This will be one of my concerns: to identify this supposed rupture between analogue and digital productivity and to mine this gap for its artistic and philosophical riches. To do so I will focus on the history of visionary art and how this history informs our notions and critical evaluations of the emerging field of telematic interactive connectivity. Perhaps it is at the junction between art and the imaginary visualisations of what is essentially the artistic animating imagination of an internalised mental map telescoping into some external projection where my research will attempt to uncover as Roy Ascott eloquently states, how "Telematic networking allows for a rich layering of meaning, image and hypothesis where there are multiple access points to the network, leading to an endless flux and flow of transformations in which everything is unstable and uncertain, open-ended and incomplete, where the emphasis is less on input/output with measurable consequences, but rather on an almost total immersion in the media flow."

Biographical note:

Joseph Nechvatal is an artist living and working in Paris and New York. His next exhibition entitled "ALT.SEX" was created over the Internet with the artist Matthias Groebel from Koln. It will open at Galerie In Situ, Aalst Belgium on May 4th, 1996.

Gillian HUNT

Research title: "'Sensitive Architecture' - The role of smart materials in resensitising the man made environment."

Analogous to the biological world, the infrastructural anatomy of a 'Smart' building is designed so that it can sense internal and external factors which enable material and structural changes to be identified and self monitored. In this way the synthetic environment may be guided by the same philosophy as our natural world. 'Self awareness' and 'responsiveness' are key concepts in the technological applications of engineers who are planning the material basis of future architectural developments. As ever more clever chemical, physical and biological sensors are developed, visible reactions to temperature changes, acoustic vibration and stress may become more diverse and parallel biological systems such as human temperament. The conceivable result of this is a liberation of an object or structure from being a receptacle or possessing received meaning only into an apparently autonomous entity, capable of independent action and reaction. The intensity of the artificialisation of the environment by technical refinement, increasingly sophisticated methods of computation and the ability to manage complex systems now permits us to produce non-homogeneous materials and manufacture objects whose forms owe very little to the industrial age. Neo technics and new science now offer the possibility of producing forms that seem to return

to a natural image.

Our relationship with the environment has previously been mediated by a familiar recognition of forms and materials which corresponded to definitions of either 'natural' or 'manufactured'. This status quo however has become increasingly difficult to maintain due to the highly complex management of materials manufacturing which renders most materials difficult to identify and understand in conventional terms. Materials are now 'made to order' with highly specialised functions. The capacity to perform modifications in the molecular structure of matter is producing materials which can be described as having 'a greater intensity of performance'; culminating in the current cultural and technical atmosphere that promotes the ethos "less matter, less energy (in manufacturing, MORE INFORMATION".

The results of this is the increased borrowing of terminologies from biological systems by new technology to describe developments in the performance of 'Smart materials', such as 'self healing concretes' in building structures, as well as the emulation of natural evolving systems by the development of genetic algorithms in artificial life programmes. Terms like 'sensitive' and 'intelligent' are now applied to materials and qualities of 'reproduction' attributed to computer programmes. Biological analogies extend to a discussion of architecture in anthropomorphic terms as it is increasingly informed by the technologies which enable changes in form to signal the processes of its metabolic systems. The 'information age' has in this sense a close dialectic with a certain 'new matter' whose qualities can be discerned as a 'hyper selection' of new materials-performances. Material combinations and manipulations may become the new factors or syntax in the description and interpretation of forms.

Biography:

Gill studied Architecture and Interior Design at Cardiff College of Art and Design and graduated in 1989. In 1993 she completed a Masters Degree in Design at the Mackintosh School of Art and Design, Glasgow University. The recent focus of her studies is an analysis of how Cybernetics as "a philosophy of design" can be interpreted in architectural terms.

Dew HARRISON

CAIIA, Centre for Advanced Inquiry in the Interactive Arts
Newport School of Art and Design, Gwent College of Higher
Education
Gwent, Wales, UK

Research title: Inter-Face Lift - "The Inter-hyper-media-net?"

At the Post-Modern end of the 20th Century technology has aided and strengthened our everyday lives, opened new channels of communication and perfected others. We are well used to viewing the world through windows from the armchair, inside our isolated nuclear family homes looking passively out onto our immediate environs or looking passively into the TV screen to glimpse our culture and view our world environment. The window as a cultural metaphor has been with us since at least the Renaissance, when painting was considered a window either representing the external world or the internal world of our imagination for edification, instruction and pleasure. The ubiquitous computer screen is the window metaphor for the 1990's offering not a permanently shut aperture for passive gazing, but a 2-way opening onto the web-wide world.

The Internet, currently seen as the information channel, has a 'hyperlink' base requiring an HTML language for entering data because the complex relationships of informative items demand intense selective linking by association rather than by indexing. The Net's underlying framework is 'hypertext' (or 'non-linear' text) to enable the semantic connections of text items. Hypertext has now evolved into hypermedia enriching the original concept with multi-media items aural, visual and hopefully soon, tactile and olfactory, a strong move towards the invisible interface.

When Net technology is sophisticated enough to follow suit, when it advances from HTML to full hypermedia for every user, it will facilitate the communication of information through non-textual data thus negating the multi-cultural problem of language translation. The juxtaposition of signs, sounds and images, moving or still, can convey concepts and understanding by their very connectedness that transcend the need to adjust to one dominant language before communication can take place. That such sounds and images can be input by different cultures giving different information about the same known earth for global consumption is, economies permitting, within the reach of every point on the planet.

The coherent linkage of items in a hypermedia system is paramount for user access, knowing how to navigate through the information web and where/how to install an additional item is essential if full interactive collaboration is to be attained. The connectivity of items within the system must therefore be made known to anyone who accesses it and this we may learn not from the computer scientists and information analysts but from the other cultures, their myths and navigation methods, that we wish to engage with in the electronic community.

An on-line, global and truly hypermedia communication network would:

1. Move the boundaries of the computer-human interface towards invisibility and therefore towards the synthesis of the human-computer dichotomy.
2. Highlight the "Window onto the World" metaphor as passive and replace it with the "Doorway to the World" metaphor implying the 2-way interactive nature of the beast.
3. Replace the Cartesian grid reference, unsuitable for non-linear worlds, with a more appropriate multi-dimensional metaphor derived from the holistic and intuitive navigation methods based on embodiment and evident in other cultures.

Biography:

I am a doctoral research student at CAIIA with an 'Arts' background (BA Hons) and an MSc in Information Technology. Current research involves the meeting of hypermedia, concept-based art and the cognitive models of associative thought which underlie both. The work processes under the title "Hypermedia systems: the interpretation and creation of concept-based art", and is concerned with creating coherent linkage systems of multi-media thoughts and ideas, fully interactive, collaborative and easily accessed by any user. It is envisaged that this line of inquiry will become particularly pertinent when artists realise that the architecture of the Internet is built upon a Hyperlink database.

Barbara Rauch

<http://caiiamind.nсад.gwent.ac.uk/barbara.html>

Research title: "Dream states / web sites"

My research is into the Web as medium: how it is constructed and how it can be used creatively. With a dedicated Dream web-page on the CAiiA site I shall collect dreams from around the world, sent as text or image. My first interactive study will involve communicating with the dreamers what I have done or plan to do with the dreams they have submitted. The dream is a particularly appropriate subject of Web study since it is highly associative and intrinsically nonlinear. Each dream is full of links, which can be translated into keywords and hotspots on the screen connecting the user to similiar dreams, quicktime movies, images or interviews. I shall construct a space in which the viewer can be in dialogue with the dreamer. I shall research into different accounts and experiences of reality, logic, time and space. The many parallels between the Web and the dream will be explored e.g. flexibility of identity, ignorance of linear time, moral issues.

Biographical note:

Barbara Rauch is an artist exploring digital media, video and photography. She studied at the Academy for Fine Art, Stuttgart 1989-93 and at the Academy for Fine Art, Prague, Intermedia School 1993-95.

Mirosław Rogala

Email: rogala@mcs.com

<http://www.mcs.net/~rogala/home.html>

Research Title: "Hand versus Body/Interactive Multimedia Space"

During my 1994-95 Artist Residency at ZKM Karlsruhe I created "Lovers Leap", an interactive multimedia environment, in collaboration with Ford Oxal Minds-Eye-View Perspective Software, Ludger Hovestadt 12-D Design, Volker Kuchelmeister CD-ROM interface design. It premiered at Multimediale 4 exhibition in May, 1995 simultaneously as a large-scale interactive two-screen installation AND as a CD-ROM work (Artintact2 book with CD-ROM publication). This experience (including staging of the work and audience interaction) allowed me to research into the nature of various interactive modes, e.g. hand versus body in the contexts of personal and public interactive spaces. As part of my research I shall develop the following pilot projects: "Garden/NatuRealization", a site-specific interactive multimedia installation and performance for Washington Square Park, Chicago, in two stages: an outdoor sound installation and a public media event utilizing Videowalls and Crane. "Divided We Stand (Human Energy)" an Interactive Media Symphony in Six Movements (an installation in development for the Museum of Contemporary Art in Chicago 1997). Other works to be critically discussed are: "Instructions Per Second" (1994) collaborative with Carolee Schneemann, "Nature Is Leaving Us" (1989), An Interactive Video Theatre Work and "The Witches Scenes/Macbeth" (1988). (On-line interview: <http://www.liveDV.com>)

Biographical note:

Mirosław Rogala is a multimedia artist, a Chicago resident and native of Poland. An early interactive work (1974-77) entitled Pulso-Funktory was a sculpture with programmed pulsating neon light and keyboard electronic sound. He studied music at Panstwowa Srednia Szkoła Muzyczna (PSSM) in Krakow and painting at the Academy of Fine Arts (Krakow) receiving an MFA degree in 1979. He graduated in 1983 from the School of the Art Institute of Chicago, MFA in Video & Computer Graphics. His media installation/performances, incorporating electronic sound, video, live music, dance, and performance, assimilate diverse images into

the creation of an uncomfortable appreciation of contemporary existence. Mirosław Rogala has exhibited at Grand Palais, Paris; Banff Center, Canada; Fylkingen, Stockholm; the International Center of Photography, The Kitchen, Anthology Film Archives, Exit Art, The Alternative Museum, and The Brooklyn Museum in New York; Museum of Contemporary Art, Los Angeles; Walker Art Center, Minneapolis; and the Museum of Contemporary Art, Chicago. He's currently a member of the visiting artist faculty at Columbia College Chicago, teaching interactive multimedia technology courses and aesthetics.

Bill Seaman

Email: seaman@umbc.edu

Research Title:

Recombinant Poetics - Navigation, Construction, Virtual Behaviours, and 'Re-Embodied Intelligence' In Interactive Art.

The aim of this research is to examine a specific realm of recombinant poetics as engendered through advanced interactive art works. A new set of poetic potentials will be asserted through examination of artworks which will be documented and/or presented as the "practice" component of this research. This examination will explore the following notions: Navigational Poetics, Recombinant Poetic Structures, Poetry Generators, Virtual Behaviours, and the notion of RE-I / 'Re-embodied Intelligence'. The concept and definition of Poly-space will be developed - a space which is constructed through the layering of all electronic spaces including 3D, 2D, video, text and sound. Such an examination will present a vocabulary of virtual image/sound/text relations. Literature pertaining to the above assertions will also be examined. Ideas will be presented in a modular form which in turn will be integrated into a structured constellation of FOCI. This work will be contextualised in relation to an interactive art work entitled "The World Generator". The World Generator is an interactive system which allows viewers to construct and generate poetic worlds in real time, based on a rotating template of potential choices. The piece presents a construction and navigation environment displayed through a series of pre-generated 3D computer graphic models; real time 'attached' behaviours related to chosen objects; a set of video loops projected onto selected objects (to function as texture maps); still image texture maps; a selection of text modules; a set of location sensitive audio/musical objects; and specific lighting variables. The system is facilitated through a new interface metaphor. A series of connected wheels are presented at the bottom of the screen. Each wheel presents a rotating set of potential choices. From the front, the viewer sees a set of curved shelving wheels of variables which can easily be explored. Each wheel is actually a rotating belt so that potentially, huge amounts of information can be contained and accessed. (Programmer - Gideon May)

Biographical note:

Bill Seaman received a Master of Science in Visual Studies degree from the Massachusetts Institute of Technology in 1985. His work explores language, image and sound relationships through video, computer controlled videodisc, CD Rom, Virtual Reality, photography, and studio based audio compositions. He is self taught as a composer and musician. His works have been in numerous international festivals, exhibitions, and museum shows. His video tape S.HE is included in the permanent collection of the Museum of Modern Art in New York. He has won many awards including a National Endowment for The Arts Fellowship, Massachusetts State Council on the Arts and Humanities Video Fellowship, two different

prizes from Ars Electronica for interactive art, the Awards in The Visual Arts prize, The 1st Multimedia Prize from the Berlin Film / Video Festival and The International German Video Art Prize. He is currently Associate Professor, Department of Visual Arts at the University of Maryland, Baltimore County. He is presently working on a collaboration with the Frankfurt Ballet directed by William Forsythe, as well as completing his first VR work.

Victoria Vesna

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Research Title: OPSEES - Online Public Spaces:
epistemological explorations of site

The proposed research projects center around public spaces on the World Wide Web, which occasionally emerge as physical installations, and critically examines psychological issues arising in response to participants' projected confrontations within these spaces. The central project will be "Bodies INCorporated," with satellite projects such as "Life in the Universe" with Stephen Hawking (an investigation into the subject of the possibility of extraterrestrial life), and "Terminals: Considering the End" (an online conference/exhibition exploring the cultural production of death). Analysis will focus on the relational dynamics unfolding between the "artists" and audience who are collaboratively involved in the world building and information gathering in an electronic environment.

Events occurring within these online public territories ignite a range of emotional responses, and raise a variety of interesting issues related to community dynamics meriting investigation. For example, in Bodies INCorporated, when a body is "killed" it is announced to the entire community of "body owners" via e-mail and made into a public spectacle. The social and psychic implications of the actual person being identified in such a public forum has the potential to radically change the community dynamic. When bodies are exhibited over the net, quite obviously, they reach a much larger audience than in a relatively restricted and restrictive space like a museum. However, once on a physical plane, owners tend to take their bodily exhibition much more seriously, and any kind of public event much more personally. The interesting question is why.

I intend to examine if the graphic representation of the body amplifies, intensifies, or increasingly mitigates our relationship to it. I will be questioning issues related to the psychological commitment and attachment 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 the body becomes a source of pleasure and anxiety as it moves through changes and permutations out of the hands of the owner, and the emotional dynamics that can result from bodies being displayed as public spectacle.

Biographical note:

Victoria Vesna is an installation and performance artist working with various technologies. She has exhibited internationally at a number of shows including the Venice Biennale (86), the P.S.1 Museum, NY (89), the Long Beach Museum (93, where she served as media council chair, and Member of Board of Directors), the Ernst Museum of Budapest (94). Victoria teaches Electronic Intermedia at UC Santa Barbara, and has been instrumental in fostering an interdisciplinary collaboration between the College of Engineering

and Art Studio. She has received numerous grants and sponsorships from various industries and educational foundations including, Wavefront/Alias, GTE Outreach, and ICA (where she serves as online editor, and a member of the policy board). This year she will exhibit a large WWW /physical installation, Body INCorporated, at the Contemporary Arts Center and SIGGRAPH '96 in New Orleans and the San Francisco Art Institute.

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LEONARDO DIGITAL REVIEWS
March 1996

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< Book Review: "At Home in The Universe",

by Stuart Kauffman >

At Home in The Universe -

The Search for the Laws of Self-Organization and Complexity

Oxford University Press

New York, USA 1995

321pp. \$25.00

ISBN 0-19-509599-5

Reviewed by Roger F Malina

Email: mason@mitpress.mit.edu

Recently I reviewed, very favorably, John Holland's book "Hidden Order" that described current work in the science of complexity and artificial life. So it was with some anticipation that I started reading Stuart Kauffman's "At Home in the Universe". Kauffman is a prominent researcher in the science of complexity and also a fellow at the Santa Fe Institute. His topic is the emergence of life within the broader interdisciplinary context of complex adaptive systems of all kinds. Where I found Holland's book clear, focused and compelling - I found Kauffman's book to be somewhat confused, frustrating, evangelical but in the end - very thought provoking. The last two chapters by themselves rescued the book. And it is a delight to read about current research and its larger meaning from the researcher himself, rather than by a science popularizer.

The last two chapters are titled "In Search of Excellence" and "An Emerging Global Civilization". These chapters present tantalizing speculations about how our growing understanding of the evolution of complex adaptive systems in biology may shed light on, and even lay rigorous theoretical foundations for studying the behavior of human organizations (corporations, cities..) and maybe on the development of culture and civilization itself. A central tenet of the "Santa Fe School" view of the science of complexity is the importance and necessity of finding discipline-independent

theoretical descriptions of complex adaptive systems. Kauffman's speculations even provide hints of bases for political theory (e.g. what is the optimal size of a human organization to allow it to adapt to a rapidly changing environment).

The heart of Kauffman's argument is that the processes of self-organization and the spontaneous development of ordered structures are far more important than we supposed. He calls this "order for free" and argues that the theory of biological evolution needs to be fundamentally modified to account for this. He argues that although our Darwinian concept of evolution driven by natural selection is still the right framework, that the spontaneous generation of complex structures is an equally important shaper of evolution. He develops in detail the ideas that complex ordered structures are highly favored when a system is located "at the edge of chaos"- and that under certain conditions systems naturally evolve to this edge of chaos where complex structures are highly favored. Life - highly evolved complex adaptive systems - can be viewed as naturally emergent - and that in this sense we are "at home in the universe". Life is not a result of accident and chance, but rather a natural property of the universe (modified by the process of natural selection).

One of the ideas developed at length is the concept of an "optimal patch" that allows a complex system to adapt successfully to a landscape of constraints and pressures. Structures that are too small may not be able to migrate to the best solution; structures that are too large may get trapped in the landscape.

Thus (p247) "flatter, decentralized organizations may function well - and that contrary to intuition, breaking an organization into "patches" where each patch attempts to optimize for it's own selfish benefit, even if that is harmful to the whole, can lead, as if by an invisible hand to the welfare of the whole organization. "In a system where the patches are too large ("the Stalinist regime") the structure may optimize on a local optimum but be frozen from finding better solutions, but that if the patches are too small (the leftist Italian limit) the system never settles down to a good state.

Another idea is how if the patches are in continuous communication with each other, this may also prevent optimal solutions from being reached. Some modeling has shown that the best strategy is (p 269) "In conflict laden problems the best solutions may be found if, in some way, different subsets of constants are ignored at different moments. You should not try to please all of the people all of the time, but should pay attention to everyone some of the time". Maybe the Internet - by driving too high a level of communication between human cultures could stifle the emergence of creative ideas!!

In the closing pages of the book Kauffman puts a damper on some of the speculation, and the danger of taking too literally research in complex adaptive systems and applying it globally (where does science become the handmaid of ideology!). Quoting Scott Momaday's work he argues that we must "re-invent the sacred in the modern world" and that "all we can do is seek to be locally wise".

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< Exhibit Review: Vasulka & Naimark >

Steina Vasulka,
San Francisco Museum of Modern Art
Michael Naimark,
Center for the Arts, Yerba Buena Gardens,

San Francisco

Reviewed by Sonya Rapoport

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URL: <http://www.lanminds.com/local/sr/srapoport.html>

Two recently constructed art spaces, the San Francisco Museum of Modern Art and its neighbor, the Yerba Buena Center for the Arts, are exhibiting large video installations that are virtually communicating with one another. In the former is STEINA AND WOODY VASULKA: MACHINE MEDIA, the dazzling retrospective of these video art pioneers. The Center for the Arts houses Michael Naimark's refreshingly innovative BE NOW HERE (see Leonardo Electronic Almanac vol. 4, no.1). Both this work and Steina Vasulka's WEST, which is included in the retrospective, are about landscape that has been created and transposed electronically into landmark works of art. The circular format of their presentations are superficially similar. Hers is a double tiered multi (22)-monitor picture field and his is a 60 degree panorama video projection onto a large screen. However, their differences rather than their resemblances, tell us more about the work.

Naimark's BE NOW HERE, created in early 1996, in a simplistic way pushes buttons that make a state of the art project. Among the buttons are interactive devices such as a 16-foot diameter rotating viewing platform - be careful not to trip; 3-D glasses; and manipulating controls on the top of a centrally located pedestal that select the video sites. In spite of the casual photography, there is magic in the total immersion one experiences among the projected landscapes. Keeping up with the camels at Timbuktu, walking along the outskirts of Angkor Wat ruins, rushing to the Wailing Wall in Jerusalem, and selecting a cafe in Dubrovnik have us mesmerized in virtual reality. Another button: Naimark has tried to give a message of a global community of contrasting cultures by selecting these UNESCO-designated endangered cities.

Steina Vasulka also shows us ancient ruins, those of the Anasazi in Santa Fe, New Mexico. But in her case, the past and the present merge in a desert landscape with the inclusion of images of a satellite saucer, mirrored sphere reflections, and railroad tracks. These images are contained in the pictorial space itself rather than by hands-on interaction. The video artwork, WEST, was created in 1983. Its formal art conventions were arrived at by recombining digitized fragments which alter our visual orientation into a purely aesthetic experience. The dynamics of images moving in and out, across, and up and down, including neither people nor community, give a message of beauty within the context of an early art form interlocking space and time.

Artist and art theorist Charles Biederman's prescient history of perceptual initiation considers ART AS THE EVOLUTION OF VISUAL KNOWLEDGE (1948). Has art surpassed the limitations of human vision and gone into the physicality of virtual experience?

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< Exhibit Review: Jeffrey Shaw's 'Golden Calf' >

Ars Electronica,

Design Center,

Linz, Austria

June 21-25, 1994,

Neue Galerie

Graz am Landesmuseum Joanneum,

Graz, Austria October 1 - November 5, 1995

Art Meets Virtual Reality and Religion

by Edward Allen Shanken

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Jeffrey Shaw wryly offers the Golden Calf as a simulated pagan object of worship for a post-religious culture that ritually propagates its myths and desires through electronic media. With poetic irony the artist performs a reverse alchemy, turning gold into liquid crystal, icon into fashion, science into faith. A hand-held, color LCD monitor set on a simple white pedestal provides an elegant yet unassuming interface between the material world humans inhabit and the ephemeral world of the virtual bovine icon. While the environment is limited, and the wiring between the elements slightly obtrusive, the viewer experiences a different sense of freedom and control manipulating this system than compared with other artwork in this medium, where typically s/he is submerged in a dark installation cubicle or encumbered with bulky apparatus. As a result, the Golden Calf presents itself in a very different relationship to its audience: rather than the viewer being a diminished object of technology, s/he has the feeling of being an empowered subject in command of the virtual world. But is this control real or virtual?

Lifting the monitor from the pedestal, the calf comes into view, set upon a virtual pedestal that resembles the real one. Moving the display results in a changing perspective on the calf that corresponds precisely to the distance and angle of the monitor to the pedestal. In other words, the calf is relatively large when the display is held close to the pedestal; as the distance increases, the calf gets smaller, according to the rules of traditional perspective. As the viewer circles the pedestal, the monitor pans 360 degrees around the calf. Dipping the monitor below the plane of the pedestal's entablature reveals the calf's underside; conversely, as the monitor rises above the plane, the calf's top comes into view. If the display enters the coordinates occupied by the virtual icon, a special property is revealed: an eerie, otherworldly void. If one were to look inside a hollow, clay model of a calf, one would see the interior surface fully articulated. But when the viewer penetrates the Golden Calf, there is no interior to see, only a faint outline suggesting the exterior articulation of its obverse extremities. In this sense, the Golden Calf is pure surface. Its interior emptiness transcends the natural laws of physical objects, and in this paradoxical unity of presence and absence the hot-wired heathen idol stakes its claim on virtual nirvana.

But this state of grace is interrupted by the haunting presence of the exterior outline, namely the teats, udder, and hooves. In fact, this is not a calf at all, but rather, a fully grown cow. Shaw's cow is, moreover, derived from an objet trouve, one of the many prefabricated and anonymous stock images that came included with the Silicon Graphics computer that Shaw and his Dutch software designer, Gideon May, used to create the work of art. A multitude of questions springs forth: Why call it a calf then? Does the arbitrary quality of this calf's origin suggest a critique of other religious icons, or do its commonness and immaculate conception suggest an affinity? Is there symbolic meaning in the voyeuristic penetration of the phantom object's mysterious interior? What is the relationship between the male creator, the viewer-consumer, and the female-procreator? And what does all this mean when it takes place in virtual reality via technology inspired by the military? Holy cow!

As in Shaw's diverse work since the sixties, the audience animates

the art object, which, it is hoped, offers the viewer a transformative experience of uncommon phenomena and alternate realities. Exactly what this transformation might comprise and whether or not it is desirable remains an open question, as do many other provocative issues raised by the Golden Calf. Perhaps it is that very cryptic quality of an oracle that makes it such a fascinating catalyst for human conjecture. Be that as it may, moving around the pedestal to observe the Golden Calf the viewer performs a sort of ritual dance, a prayer to the disembodied cult object. Wittingly or not, s/he has been incorporated into the enactment of a quasi-religious ceremony. Ironically, at this moment, the emphasis shifts to the human element of this work, i.e. the viewer who bows up and down, genuflecting on the miraculous world of the mythic icon. There is a curious tension between the feeling of freedom and control and the performance of dutiful worship. The viewer can laugh at the playfulness of the work, the irony and absurdity of praying to an archaic idol resurrected in silicon and software. Alternately, the viewer can contemplate the more serious ramifications of human seduction by technology into a state of pre-programmed obedience. Thus, the Golden Calf can be seen as a system that constantly shifts and slides between the quantum world of microelectronic telepresence and the macro world of biological interactivity, poking fun at and questioning the sanctity of each.

The actual momentary interaction with the Golden Calf is only part of the experience. After returning the monitor to the pedestal and leaving the exhibition, memories of it remain and questions about the ontological status of those memories begin. What exactly is remembered? What is it like to remember something that exists only virtually? What is the quality of that memory? In a word, enigmatic. I remember experiencing a feeling of freedom and control while manipulating the virtual environment. Upon reflection, however, I became aware that my freedom was only partial, for I had become part of a system in the service of which my behavior had been subsumed. As for the experience of the virtual icon, my memory can be compared with how I remember the dialogue of a subtitled foreign film: I have no recollection of the written text; in my memory, the actors' own voices communicated to me in my mother tongue. Similarly, I remember the Golden Calf as a solid, three-dimensional object, unmediated by any apparatus. In contrast, however, I also remember it as an ethereal, presence/nonpresence in cyberspace. My memory is thus rooted in the paradox between the real and the virtual. Shaw's work simultaneously combines and conflates these worlds, allowing the viewer to inhabit one while remaining anchored in the other - both during the experience and upon reflection.

Whereas the single, spiritual god of the Judeo-Christian religion replaced the polytheistic, material cult of animism, Shaw's techno-wizardry revitalizes an ancient relic which, by virtue of its silicon miracles, engages its viewers in a farcical religious transformation. Indeed, technology has become the god of information society. But blind faith in its beneficence must be carefully considered, for as Shaw intimates, it is empty inside, it has no spiritual core, no sense of responsibility or ethics. Though it demands reverence and provokes questions, the Golden Calf offers no salvation and admits of no answers. It should be remembered also, that gold is not just a precious material, but that it possesses outstanding conductivity, allowing the rapid transmission of electrical information with little resistance. Similarly, the Golden Calf is not just a precious ether, but possesses the remarkable ability to merge seemingly antithetical worlds. And perhaps the most prescient contribution of VR

technology might be to create a bridge between the false dualities that define the western perceptual tradition: subject/object, real/simulated, good/evil. In this regard, the Golden Calf is a formidable achievement because it accomplishes and promotes the harmonious coexistence of divergent realities, offering hope of a new paradigm that transcends destructive dichotomies, constructing a polychotomous mode of perception, a cyberception, based on mutuality, simultaneity and consonance.

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Working and living in Paris, France. Consultant in electronic arts: Executive director of CHAOS, non-profit organization which publishes the IDEA/International Directory of Electronic Arts. Artistic director of ART-EL, a company organizing exhibitions and events in the field of art, science and technology. Free lance art critic for the French contemporary art magazine Art Press and editorial board member of the journal Leonardo. Teacher at the Art School of Aix-en-Provence. President of the ASTN (Art, Science and Technology Network). Particularly interested in "art and communication/network art" and in "Space art".

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Edward A. Shanken is a graduate student in Art History at Duke University in the US. His studies focus on intersections between art, technology, and the formation of consciousness. In particular, he has done extensive research on the artist/theorist Roy Ascott. Shanken's paper "Technology and Intuition - A Love Story? Roy Ascott's Telematic Embrace" was presented at the Einstein Meets Magritte conference in Brussels in June, 1995 and will be published in 1996. Shanken was a scholar in residence at the ZKM, Karlsruhe, Summer 1994, where he researched the work of Jeffrey Shaw, one result of which is his review, "Jeffrey Shaw's 'Golden Calf': Art Meets Virtual Reality and Religion" published in the LDR, February, 1996.

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< LDR Announcements >

< Compleat Webster Information >

The Compleat Web-ster, guest edited by Kevin Murray, can be found at Leonardo Digital Reviews.
URL: <http://www-mitpress.mit.edu/Leonardo/ldr.html>

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< END LEONARDO DIGITAL REVIEWS MARCH 1996 >
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PUBLICATIONS

< Mikropolyphonie - a new on-line contemporary music journal >

David Hirst
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http://farben.latrobe.edu.au/Music_Docs/MusDeptHomePge.html

Mikropolyphonie is a new on-line journal, and aims to encourage scholarly analysis and discussion of contemporary music making and research, of any genre. It will be a refereed journal published on the World Wide Web.

In *New Directions in Music*, David Cope defines mikropolyphonie as "highly complex densities of polyphonic motion in which no single voice dominates" - this is the philosophy of the journal in that we hope to promote lots of different viewpoints through our web pages where no one doctrine will dominate. We hope that the journal will promote contemporary music in a post-industrial, multi-cultural world.

Each issue will contain a feature article section, a general article section, a communication page, a review page, and a what's new page.

Call for submissions:

This is a call for submissions for the first on-line issue of Mikropolyphonie. Its feature section will be on "Musical Futures" in which we invite you to speculate on music beyond 2000. Articles can adopt this theme or any general subject matter associated with contemporary music. Contact David Hirst for submission details.

< The Computer Music Tutorial >

Curtis Roads

Email: 100407.574@compuserve.com

URL: <http://www-mitpress.mit.edu/mitp/recent-books/comp/roads.html>

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1234 pp. - 504 illustrations

The Computer Music Tutorial is a comprehensive text and reference that covers all aspects of computer music, including digital audio, synthesis techniques, signal processing, musical input devices, performance software, editing systems, algorithmic composition, MIDI, synthesizer architecture, system interconnection, and psychoacoustics. A special effort has been made to impart an appreciation for the rich history behind current activities in the field.

Profusely illustrated and exhaustively referenced and cross-referenced, The Computer Music Tutorial takes the reader step-by-step through the entire field of computer music techniques. Written for nontechnical as well as technical readers, the book uses hundreds of charts, diagrams, screen images, and photographs as well as clear explanations to explain basic concepts and terms. Mathematical notation and program code examples are used only when absolutely necessary. Explanations are not tied to any specific software or hardware.

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ANNOUNCEMENTS

< COMPUGRAPHICS '96 - Fifth International Conference on
Computational Graphics and Visualization Techniques >

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Location: Nogentel Nogent-sur-Marne Paris FRANCE
Date: 15-19 December 1996

The GRASP - Graphic Science Promotions & Publications conference aims at gathering together outstanding educators, professionals and researchers in Graphic Science, and will comprise invited lectures, panels, videos and papers reviewing, presenting a state of the art, discussing future directions or reporting new results on the respective fields. It will be open to contributors from all ranks and from over the world. The conference is not simply a 'computer graphics' meeting but a truly all-encompassing event on all aspects and sub-areas of Graphics/Graphic Science. Contributions will be properly refereed by the corresponding Program Committees. A selection of compatible papers may be made to appear in various scientific journals. The proceedings will constitute a registered publication by GRASP and internationally distributed. An exhibition of publications and graphics vendors will also be organized concurrently. A tutorial program will also be offered.

Topics include: Technical Drawing, Engineering Graphics, Descriptive Geometry, Theoretical Graphics and Classical Geometry, Computational Geometry, Geometric Modeling, CAGD, Computer and Computational Graphics, Image Synthesis and Processing, Art, CADD, CAI, CAD/CAE, CAAD, GIS, Industrial and Engineering Design, Finite Element and other Numerical Methods, Artificial Intelligence and Expert Systems, Scientific Visualization, Standards, Systems/Software, Human-Computer Interface, Physically-based Modeling, Animation, Natural Scene Simulation and Fractals.

Supporting Organizer and Co-Chair of the Program Committee:
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GRASP - France
Nogent-sur-Marne
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< CIBERFESTIVAL >
Greg Garvey
Email: GGARVEY@VAX2.CONCORDIA.CA

The Ciberfestival 96 "imagens do futuro" is currently running in Lisbon at the Portugal FORUM TELECOM. This exhibit was produced in collaboration with La Cite des Arts et des Nouvelles Technologies de Montreal and the FORUM TELECOM e ITM, Inovacao e tecnologia Multimedia SA and features the following:

- + Holograms by Ana Maria Nicholson of New York
- + An online "workshop" entitled WONDER SCHOOL by Aula do Risco, Lisbon
- + Plante en croissance interactive (interactive plants growing by Frankfurt, based Christa Sommerer and Laurent Mignonneau
- + "Je seme a tout vent" by Edmond Couchot, Michel Bret, Marie Helene Tramus, Paris
- + "Maquina dos Sentidos" by Emanuel Dimas de Melo Pimenta, (Lisbon)
- + "le Sympho" by Francois Castello, Hadi Kalafate, France
- + "Luva Magica" by G.A.S.A Grupo de Analise de Sistemas Ambientais, Faculdade de Ciencias e tecnologia, Universidade Nova de Lisboa
- + "The Automatic Confession Machine: A Catholic Turing Test" by Greg Garvey, Quebec
- + "Uau! Era consigno mesmo que eu queria falar!" by Luisa Cunha, Lisboa
- + "Seduction" by Marjorie Franklin, USA
- + "Telematic Dreaming" by Paul Sermon, Leipzig
- + "Instead of a Place" "IP6" by Paulo Carmona, Lisboa
- + "Telespechio" by Sabine Reiff and Flavia Alman
- + "Mandala System" by the Vivid Group, Vincent John Vincent
- + "Watch Yourself" by Tim Binkley, USA NYC

This represents the first major exhibition of interactive art in Portugal.

< 1997 College Art Association conference session on
Electronic Arts and the Concept of the Gesamtkunstwerk >

Michael Rodemer
Co-Director of ISEA97
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School of the Art Institute of Chicago
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Submissions are invited for the 1997 College Art Association conference session on Electronic Arts and the Concept of the Gesamtkunstwerk (Total Artwork) to be held in New York City, February 12-15, 1997.

Using computers, artists are able to orchestrate video, light, movement, and sounds in artworks which often incorporate elements of painting and sculpture as well. Since these artworks typically change over time and/or through interaction, artists naturally look to music, theatre, literature, and dance for structuring principles for their work. Thus, in the interplay of the arts, the concept of the "total artwork" gains in importance as a historical precedent and as a lens through which to view contemporary tendencies. Although Richard Wagner coined the term, with opera in mind, to designate an artwork in which a group of artists unifies various media in a universal statement about human life, the term has come to be applied to more broadly. Studio artists and art historians are invited to present papers and/or discussions of

artworks which employ the concept of the total artwork to encourage thinking about the aims and effects of artmaking with computers, and to help create a richer critical perspective from which to view some of this new work.

Submissions should be received by April 10, 1996, and should include:

- a preliminary abstract of 1 to 2 pages
- a letter explaining your interest and expertise in the topic
- an indication of CAA membership (waived for foreign participants)
- c.v. with your home and office addresses, phone, fax, email
- slides, videotape, or other documentation of work, with SASE for return
- a stamped, self-addressed postcard for confirmation of receipt of the proposal.

Determination of acceptance will be made by May 10.

< 1997 College Art Association conference session on
Crossing the Boundaries: Electronic Art, Within and Without >

Lily Diaz, Session chair
Media Lab
University of Art & Design, Helsinki
135C Hammentie
SF 00560 Helsinki Finland
Email: diaz@uiiah.fi

CAA, the COLLEGE ART ASSOCIATION, is holding its 85th Conference on February 12-15, 1997 in New York City, and Lily Diaz is requesting proposals for papers, projects and presentations.

"Nepantla is the Nahuatl word for an in-between state, that uncertain terrain one crosses when moving from one place to another...when travelling from the present identity into a new identity."

Gloria Anzaldua

The objective of this panel is to investigate the idea of electronic networks as new frontier territories in constant state of fluxus. Within these spaces, we are interested in examining not only how boundaries are defined, but also, how they are recognized. Without physical media to administer, we would like to survey the role of the artist as communicator and innovator. Does the lack of physical presence have an effect on the ability of individuals to cross over boundaries? Can we have a Puerto Rican art community based in Helsinki that, through the network, spans a global presence? What role does national and ethnic identity play in the forming of such entity? Where is your community? What can be the role of art and artists in the furthering of communications in and among virtual communities? What kinds of art can be produced in these spaces?

The panel is concerned with the topic of boundaries and how electronic media affects our perception of them. More specifically how this relates to the notion of the individual, and the notions of identity and community. Lily is interested in papers and presentations that discuss these issues theoretically and concretely. Presentations are 30 minutes. If you are selected to be a speaker, you must be a member of the CAA. (This last requirement is waived if you are a foreign national, living abroad, or a member of a profession that is not related to the

arts, or an artist or scholar not affiliated with an institution...)

Deadline: April 15, 1996

For more information about the College Art Association write to:
College Art Association
275 Seventh Avenue, New York, NY 10001
Fax 212/627-2381

< Artificial Evolution Studio plans artificial life event >

Bruno Degazio
The Artificial Evolution Studio
192 Spadina Avenue, Suite 512
Toronto, Ontario, Canada, M4Y 1W5
Email: degazio@mail.north.net

The Artificial Evolution Studio is planning a concert-exhibition for the spring of 1997. This event will present a full-blown concert of music created using artificial life, as well as an exhibition of other art employing the same ideas. We are currently collecting information for this event.

- Areas of interest include, but are not restricted to:
- + Genetic Algorithms
 - + Cellular Automata (Conway_s Life)
 - + L Systems (Lindenmeyer's artificial botany)
 - + Computer Viruses
 - + Dawkin_s Biomorphs
 - + Artificial organisms (Langton's Vants, Reynolds' Boids, MIT Mobots)
 - + Artificial environments (Tiara, Venus)

- We are interested in applications of these ideas to:
- + music composition
 - + sound and image synthesis
 - + computer animation
 - + interactive sculpture
 - + installation art
- *****
< ICAD '96 - Update >

Steven P. Frysinger
James Madison University
College of Integrated Science & Technology
Harrisonburg, Virginia 22807
Tel: 540/568-2710
Fax: 540/568-2761
Email: frysinsp@jmu.edu

The Third INTERNATIONAL CONFERENCE ON AUDITORY DISPLAY is being held in Palo Alto, California on November 4-6, 1996, Co-sponsored by Santa Fe Institute and Xerox PARC. ICAD was announced in LEA 3:11 (November 1995), and this announcement reflects the change in location and the participation of Xerox PARC in the event. There is still time to send proposals.

Submissions should include a 4 page summary for the papers, 2 page summary for the Project Reports, and an abstract only for the informal presentations. These must be received by May 20, 1996. Notification of acceptance will be made by July 15, 1996. Submit 6 copies.

Note: There will be a strong preference for presentations with sound.

< ART-Science-ATR -
International Symposium on Art and Science in Japan >

Christa Sommerer
ATR Advanced Telecommunications Research Lab
MIC Media Integration & Communications Laboratories
2-2 Hikaridai, Seika-cho, Soraku gun
619-02 Kyoto, Japan
Vox: 81-7749-5-1426, Fax: 81-7749-5-1408
Email: christa@mic.atr.co.jp
URL: <http://www.mic.atr.co.jp/~christa>

ATR Advanced Telecommunications Research Laboratories and the newly created MIC Media Integration & Communications Research Laboratories are hosting an international symposium dedicated to the relationship between Art, Science and Technology.

MIC Media Integration & Communications Research Laboratories are pioneering the combination of art & science in Japan, being probably one of the first Japanese institution creating and enforcing this link.

Invited Speakers:

Itsuo Sakane - Keio University, Tokyo Japan
Donna Cox - NCSA, Illinois USA
Dan Sandin - University of Illinois in Chicago, USA
Hiroshi Ishii - MIT Media Laboratory, Cambridge USA
Demetri Terzopoulos - University of Toronto, Canada
Przemyslaw Prusinkiewicz - University of Calgary, Canada
Machiko Kusahara -Tokyo Polytechnics, Japan
Erkki Huhtamo - University Lapland, Finland
Peter Weibel - Academy of Applied Arts Vienna, Austria
Philippe Queau - Imagina INA, MonteCarlo
Akira Asada or Toshiharu Ito - InterCommunication Center Tokyo, Japan
Paul Haeberli - Silicon Graphics, Mountain View USA
Michael Naimark - Interval Research, Palo Alto USA
Peter Richards - Exploratorium, San Francisco USA
Jeffrey Shaw - ZKM Karlsruhe, Germany

Complete program, titles and abstracts:

<http://www.mic.atr.co.jp/~christa/Aindex.html>

Place:

ATR Advanced Telecommunications Research
Institute International
2-2 Hikaridai, Seika-cho, Soraku-gun,
Kyoto 619-02, Japan
Tel: 81-77495-1402, Fax: 81-77495-1408

Dates:

13 & 14 May 1996

How to attend:

Free attendance! Please call, send email or fax to:
Ms. Kana Itoh & Ms. Miho Nishimura
2-2 Hikaridai, Seika-cho, Soraku-gun,
Kyoto 619-02, Japan
Phone: 81-7749-5-1212 and - 1402
Fax: 81-7749-5-1408
itoh@atr-sw.atr.co.jp, nisimura@mic.atr.co.jp

< Leonardo Web Surfing Project >
Leonardo/ISAST

Pat Bentson
Email: pbentson@ sfsu.edu.

We Need Web Surfers!

Leonardo seeks surfers interested in surfing the Web and creating descriptions of resources related to art and music. We pay a fee for each form filled out on-line with a web resource description. If you are interested in working with us on this project, please send email for more information.

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OPPORTUNITIES

< GMD seeks an Institute Director >

Monika Fleischmann, Research Scientist/Artistic Director
GMD - German National Research Center for Information Technology
Institute for Media Communication (IMK)
Dept. Visualization and Media Systems Design (VMSD)
Schloss Birlinghoven, D-53754 Sankt Augustin
Phone:++49-2241-14-2809 (Fax: -2040)
Email: fleischmann@gmd.de
URL: <http://viswiz.gmd.de/>

GMD - German National Research Center for Information Technology is Germany's national laboratory for media, information and communication technology. It is a member of the Hermann von Helmholtz Society of German Research Centers. GMD is funded by the Federal Republic of Germany and the States of North Rhine-Westphalia, Hesse, and Berlin. GMD's headquarters are located in Sankt Augustin near Bonn with additional institutes in Berlin and Darmstadt and a liaison office in Tokyo. A large part of the total budget of 170 Mio DM is financed by research contracts and national and international cooperation projects.

As one of the larger national research centers for information technology in Europe with approximately 980 employees, GMD focuses mainly on application-oriented fields of research. These are currently:

- + System Design Technology
- + Communication and Cooperation Systems
- + Intelligent Multimedia Systems
- + Parallel Computing

Our newly founded Institute for Media Communication in Sankt Augustin has the position open for the Institute Director. We are looking for an internationally renowned individual from research or industry who can strengthen the institute's competitive position internationally. Suitable candidates will have experience in managing large research groups as well as experience in cooperating with industry, preferably in the media field.

The Institute for Media Communication carries out research and development in the design, production, provision and transmission of audio-visual media - including virtual reality and computer animation - with a focus on distributed interactive applications.

The (at present) 50 scientists and technicians of the institute work in the fields of:

- + distributed digital studio technology
- + interactive broadcasting
- + real-time visualization
- + virtual environments
- + distributed multimedia architectures
- + design and implementation of broadband networks
- + pilot applications of broadband technology

The institute director will be appointed for a term of 5 years with the option for reappointment. A joint appointment in cooperation with a university in the State of North Rhine-Westphalia is intended. The position is remunerated at the level of a full professor at a German university (C4-position).

GMD is endeavouring to increase the percentage of women scientists and will give preference to handicapped / disabled persons with equal qualifications.

For further details, please contact the Chairman of the search committee:

Prof. Dr. Radu Popescu-Zeletin
 Tel: +49-30-25499-206
 Email: popescu-zeletin@gmd.de

as well as the Chairman of the Board of Directors of GMD:

Prof. Dr. Dennis Tsichritzis
 Tel: +49-2241-14-2294
 Email: tsichritzis@gmd.de

Please send your applications to:

Prof. Dr. Dennis Tsichritzis
 Schloss Birlinghoven
 D-53754 Sankt Augustin

The deadline for applications is March 29, 1996.

< System Programmer for Audio and Music at 3DO >

Phil Burk
 3DO Company
 600 Galveston Drive
 Redwood City, CA 94063
 Tel: (415) 261-3100
 Email: phil.burk@3do.com

Job Opening for System Programmer for Audio and Music at 3DO

System programmer needed to design and develop operating system level audio and music software. Opportunities include developing new realtime software synthesis programs for our proprietary DSP, working with hardware engineers to develop our next generation audio systems, developing system level tools for creating and controlling sound effects and music using the DSP, and writing example programs to inspire our developers.

Required skills:

- strong 'C' programming experience,
- operating system programming experience,
- knowledge of digital audio and common music synthesis algorithms,
- knowledge of audio software on PC compatible systems,
- low level MIDI programming,
- assembly language programming,
- working knowledge of commercial music software,

experience with sound design and composition,
good writing and communication skills.

Bonus skills:

DSP assembly language programming,
knowledge of advanced or experimental signal processing
algorithms,
Forth programming skills,
PPC or other RISC assembly language programming,
knowledge of CSound, CMix, or equivalent,
knowledge of ADPCM, MPEG or other compression techniques,
resource management and allocation techniques,
working knowledge of cross platform audio APIs,
hardware design experience.

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ACKNOWLEDGMENTS

LEA and Leonardo/ISAST gratefully acknowledges Interval Research Corporation for its continuing support of Leonardo Electronic Almanac.

LEA
WORLD WIDE WEB
AND
FTP
ACCESS

The LEA Word Wide Web site contains the LEA archives, including all back issues, and the Leonardo Electronic Gallery. The Profiles and Feature Articles have been extracted from the back issues, and reside in their own sections of the site. It is accessible using the following URL:

<http://www-mitpress.mit.edu/LEA/home.html>

Back issues, submission guidelines and LEA Gallery files are available via ftp anonymous, using the following method:

```
ftp mitpress.mit.edu
login: anonymous
password: your_email_address
cd pub/Leonardo/Leonardo-Elec-Almanac
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===== < End of Leonardo Electronic Almanac 4(3) > =====

© Reuters. FILE PHOTO: A man wears a protective mask as he walks on Wall Street during the coronavirus outbreak in New York. By Joshua Franklin and Pamela Barbaglia. NEW YORK/LONDON (Reuters) - Global M&A activity tumbled to its lowest level in more than a decade in the second quarter, according to data provider Refinitiv, as companies gave up on expansion plans to focus on protecting their balance sheets and employees in the wake of the coronavirus outbreak. Chief executives were reluctant to explore transformative deals without more certainty about the financial outlook of their companies