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INTRODUCTION

- < This issue >

Craig Harris

This month I am pleased to present descriptions of recent works by Eduardo Kac. As LEA readers may recall, Eduardo Kac's hyper-poem "Storms" was presented earlier this year. These descriptions provide a broad view into his work. LEA contributors are invited to present this kind of perspective of a body of work in LEA. Keep in mind that we can utilize the MIT Press file server to provide multimedia resources in support of these perspectives.

In a Letter to the Editor, Simon Penny addresses some of the difficulties that artists face in selecting such established organizations and events as ACM's SIGGRAPH as venues to represent their work. I welcome LEA readers to pick up on the thread of this discussion.

Several in-depth perspectives appear in Leonardo Digital Reviews this month, providing insights into a variety of works. And for those of you who are still considering submitting work for ISEA 95, the deadlines are posted, and the application forms for submitting materials are made available. January 15, 1995 is the first deadline, so time is running out!

- < Letters to the Editor >

Simon Penny
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Dear Sir,

Some of your readers may have attended SIGGRAPH 93 at which the Machine Culture: The Virtual Frontier exhibition of interactive art occurred. Machine Culture: The Virtual Frontier contained the work of 29 artists working in interactive media from around the world. At the time it was the only global survey exhibition of interactive art to have occurred. In some terms it can still claim that distinction. I curated and produced that exhibition and edited the circa 100 page catalog for it, which became part of the SIGGRAPH 93 Visual Proceedings. This work represented 18 months of full time unpaid labor (all SIGGRAPH chair positions, to my knowledge, are voluntary). The exhibition was, by all

accounts, a great success, both artistically and financially.

My disappointments in the exhibition were these:

1. That it was not open to people other than SIGGRAPH Attendees.
2. That the catalog (Visual Proceedings) was so ineptly produced by the SIGGRAPH publications group that supplies ran out on the first day of the conference, and most of the exhibitors did not even get copies.
3. That the catalog contained so many design and compositing errors that a wholesale redesign and reprinting was necessary. This of course did not happen till after the conference.
4. That the SIGGRAPH Executive Committee would not release the required funds to complete an excellent video documentary of the show, the production of which SIGGRAPH 93 had funded up to the digital off-line edit stage. This video would have been a unique research and teaching tool, being the only (to my knowledge) video documentary on interactive media art. This consistent refusal to complete the project has always seemed strange to me. Distribution of such a document to universities and libraries around the world could only increase the reputation of SIGGRAPH.

Having had these experiences working with SIGGRAPH, my response to the notice in LEA vol2#11 that MIT would publish a volume (1993 and 1994 SIGGRAPH Visual Proceedings) including the SIGGRAPH 93 Visual Proceedings was mixed. I am very pleased to see that the work of the artists and theorists whose work I brought together for Machine Culture will finally be available to an audience wider than the SIGGRAPH membership. This is something that I and my colleagues who chaired exhibitions at SIGGRAPH 93 fought long (and unsuccessfully) for. I was however disappointed that I had not been informed of this publishing agreement, nor heard a whisper of it, until I read of it in LEA.

I had always envisioned the videotape being distributed with the catalog to Machine Culture. Together they would be a complete and rich research tool and a significant historical document. Perhaps MIT Press can be interested in sponsoring the completion of the tape, to be made available to accompany the new book?

Yours Sincerely
Simon Penny

Janet Fisher
Journals Manager
The MIT Press Journals
55 Hayward Street
Cambridge, MA 02142 USA

Dear Craig and Roger,

If you publish the Simon Penny letter, we might want to make clear that the edition being distributed to Leonardo members by MIT Press is the same ACM edition -- no changes have been made (or allowed?) by ACM.

[Ed: Simon will recall that he and I had several conversations back in 1993 directed towards getting the catalog published more widely. Both Leonardo/ISAST and MIT Press worked hard on this project, discussing design, distribution and production costing issues, only to be derailed due to the lack of ability within ACM SIGGRAPH to respond to the challenge of expanding their horizon within the domain of the SIGGRAPH Art Show. I recall some perplexing discussions with the SIGGRAPH Publications Committee which snagged on ACM headquarters restricting information on what did and what did not fall within the realm of their semi-exclusive publishing agreement with Addison Wesley. I use the word

"semi-exclusive" because the exclusivity really related only to the publication of the technical papers, and not to the work exhibited in the art show. However, the SIGGRAPH Publications Committee was apparently not allowed to have access to the kind of information that would allow them to proceed with discussions, and ACM can only respond to their reasons for not pursuing what was obviously a win-win situation for everybody.

At ACM Multimedia 94 FineArt Forum Editor Paul Brown informally raised a question regarding selecting appropriate venues for artists working with new technologies. Paul suggested that it may be outdated to expect SIGGRAPH to encompass all that relates to the use of computers as a medium for artistic expression. Following this thought a bit further, it would seem that the venue might shift to a different event, such as ACM Multimedia 94, or perhaps more appropriately the International Symposium on Electronic Art (ISEA). Another possibility, however, points to a more fractured environment, where each technology conference creates its own art show (if at all), in a more balkanized relationship among the different "cultures" being represented.

This latter scenario is the one that is most likely to unfold, unless there is some kind of "movement" among the people involved in the field. Meera Blattner, co-chair of the ACM Multimedia 94 event, should be commended for her determination to establish an Art Show right from the beginning. Beverly Reiser, President of YLEM, should also be recognized for assembling a strong Art Show on exhibition during the event. However, this was done with very little support from ACM, and little lasts beyond the event in the way of documentation, especially considering the world outside of ACM.

As ISEA evolves it promises to be an important venue for artists working in the media arts. At the same time, while it will likely serve the artist community well, it may also serve to isolate the artist from the technological community served by the ACM venues. That scenario also has its obvious drawbacks, and many artists even question the value of participating in any of these established venues.

And then there's the net.]

Bob Willey

Email: bobw@carla.ucsd.edu

Subject: A taxonomy of computer music

I have begun a network to promote computer music in the Americas, growing out of an exchange program funded by the Rockefeller Foundation between CCRMA, CRCA (UC San Diego), and LIPM (Buenos Aires). I found the recent discussion in the Computer Music Journal [and Leonardo Electronic Almanac, Volume 2, No. 1 - January 1994] thought provoking. I want the network to develop collaborative research, music production, and education. I thought of dividing each of the 3 areas into categories, perhaps using part of the simpler ICMC list compiled by Bruce Pennycook.

I hope the network will be used to foster exchanges of information and music. I chose to limit it to north and south America in order to make it more manageable and to make it an electronic compliment to physical travel among neighboring countries. Of course it will be open to people elsewhere with network connections.

I am still faced with the organizational problem mentioned in some of the letters, wanting to make interconnections

between areas as easy as possible. The more detailed the subdivisions become, the more likely that people will miss information stored elsewhere. For this reason I plan to keep the subjects as broad as possible. I have the added complication of presenting material in English, Spanish, and Portuguese. Any suggestions you can make at this early stage will be very helpful.

The prototype is on the world wide web at:

<http://crca-www.ucsd.edu/bobw/camino.html>

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FEATURE ARTICLES

< Recent Works by Eduardo Kac >

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INTRODUCTION

Keith Holz, Curator
Center for Contemporary Art,
University of Kentucky, Lexington

The works described here appeared in an exhibit entitled 'Dialogues', which took place from October 21 to November 11, 1994. All works presented address the role of communication processes in our lives and have in common an innovative and radical use of electronic media.

'Dialogues', which is making its debut in Lexington, consists of works that challenge the notion of the materially stable 'art object'. All pieces in the show are essentially constituted of immaterial elements, such as light, remote places and different time zones, oral conversations, video conferencing, robotic navigation, multiplicity of virtual spaces, synchronicity, human/machine interactions, animal and plant interaction, and digital information transmission, reception, and exchange.

14,400 baud, Internet, RAM, world-wide cellular telephony, virtual environments, FTP, CD-ROM, interactive television, bitmaps, digital video The list of terms continues which references new technologies being incorporated into our lives today. Against such terms we measure our familiarity or ignorance, curiosity or indifference toward the communications technologies which restructure the character and quality of contemporary experience. For a limited time, the installation of "Dialogues" within (and beyond) these gallery walls provides an opportunity to examine questions germane to the

current status of art, communication, and politics. Supported by familiar hardware, Kac's artworks are comprised of elements as immaterial as light, distant places, video conferences, robotic navigation, different time zones, human/machine interactions, animal/plant interaction, and the exchange of digital information. They each make a critical gesture which exposes the hierarchical and highly controlled communications networks, prompting participants to rethink potential alternatives to the existing forms of social intercourse. Kac takes cues from the practices of the historical European avant-gardes following World War I. Then, as now, technology was making dramatic interventions into everyday life, culture, and politics.

Experimental artists embraced new technologies to make work which underscored audience members' roles in the completion of the artwork and thereby undermined precious notions of art's autonomy, and also dispelled romantic notions of authorial subjectivity. Kac also draws upon the radicalization of artistic activity and reception of the late sixties which moved art outside the commercial gallery system toward more immaterial practices and cultural propositions keyed to the investigation of language now safely termed conceptual art. Like artists during these earlier periods, Kac is attuned to the quantum adjustments restructuring private and public communicative exchange by responding with both symbolic and interventionist counter-propositions to the situation. Since the end of the Cold War, new hopes and anxieties have emerged in the face of the new electronic international public sphere which knows no national boundaries. The viability of a political art now appears more plausible and urgent than before. Legislation is now pending and legal cases are before courts which may well regulate the shape, structure, and rules of behavior for the emergent global public sphere. Beyond issues pertaining to ownership and control, a key matter subtending these deliberations is the unprecedented level of self-abstraction which has introduced pressing questions regarding human agency, identity, interaction and responsibility.

It is within this actually existing communications situation that Kac's "Dialogues" intervene. Each of Kac's pieces is premised, if not reliant, upon individual, internationally dispersed participants contributing and thereby unleashing the potential significations of each artwork. If not linked to remote places via direct telephone lines, Kac's artworks are simultaneously available to participants on the Internet just as they are to gallery visitors. Their ongoing continuation (no closure or completion here) by participants actuate an expanded environment wherein the possibility (or impossibility) of qualitative symbolic exchange within the current technological context can be probed. The telepresencing pieces also prompt reflection upon one's status as an active member of an imagined -- technologically constituted -- community. Through the creation of simple and complex hybrids of existing communications technologies, Kac demystifies their conventional operations and arrangements and encourages participants to consider how the slippages and gaps between discretely conceived media, when modulated together, might offer emancipatory alternatives to such codified usages typified by unidirectional media forms as television. Similarly, the settings created by Kac's hybrids also encourage resistance to impoverished notions like "transmission" or "input/output," and instead promote negotiation between participants (while questioning the very possibility of communication). Considered from these perspectives, Kac's current work is directed at the enablement of a system of symbolic exchange which establishes a radically democratic public sphere. In this new environment, where public and private meet, participants remain alert to their potential

agency and responsibilities, as they learn to define and negotiate them within the emerging global context.

ELASTIC FAX 2, 1994

Artists from all over the world send between six and twenty-four sequences of images each to a fax machine displayed above eye-level. The images pour down, resembling a waterfall and the movement of film frames in a projector. The piece is complete when the 98 feet roll is used up. Unacquainted international participants collaborate to create a faxfilm that edits itself at random as the images arrive. The long roll is on display on the wall. The viewer becomes a "virtual projector" as he or she walks by this faxfilm.

Note: Elastic Fax 1 was presented at the Museum of Modern Art, Rio de Janeiro, Brazil, in 1991.

ACCIDENT, 1994

This looped, stereo digital video piece manipulates the verbal, the visual, and the aural dimensions of language to question the possibility of verbal communication. The dissolution of a sentence suggests new combinations of letters which result in new meanings. The rhythmic frenzy of the audiovisual experience reflects the vibrant movement of the words as new meanings are born and die. The piece can be seen anywhere in the world after downloading through the Internet from this FTP site: [convex.cc.uky.edu \(pub/artsource/accident\)](http://convex.cc.uky.edu/pub/artsource/accident). Log on as anonymous.

ESSAY CONCERNING HUMAN UNDERSTANDING, 1993-94

A bird in a cage in Lexington dialogues over a regular phone line with a plant in artist Ikuo Nakamura's studio in New York city. The bird's voice is converted to electric fields that the plant can sense. The plant's electric field is converted to audible sound. As this piece projects the complexities of electronically mediated human communication over nature, it surprisingly reveals aspects of our own communicative experience.

ORNITORRINCO IN EDEN

(In collaboration with Ed Bennett), 1994

Eduardo Kac terms this piece a "networked telepresence installation" that consists of three nodes of active participation and multiple nodes of observation worldwide. In this piece, the telerobot Ornitorrinco (Platypus, in Portuguese) in Chicago is controlled simultaneously by participants in Lexington and Seattle. The remote participants share the body of Ornitorrinco. Communication takes place not through verbal or oral exchange but through the rhythms that result from their engagement in a shared mediated experience. Via the Internet, they see the remote installation through Ornitorrinco's eye. They control the telerobot simultaneously via a regular telephone link (three-way conference call) in real-time. As the piece is experienced through the Internet, anybody in the world with Internet access can see it, dissolving gallery boundaries and making the work accessible to larger audiences. This was available using CU-SeeMe on October 23, 1994.

UPC, 1993-94

One at a time, silent letters move across the CRT display, with no space between them. The viewer is forced to read them as individual characters. Once the visual pattern that defines the words is broken, we focus our attention on the letter, magnifying the arbitrariness and the sequential nature of language. The statement that zooms by the screen criticizes dualistic schemes and celebrates a conception of space that implies the abolition of familiar parameters. Ironically, the title refers to Universal Product Code, white labels with black

stripes of varying thicknesses used to scan the product data in supermarkets. This was available using CU-SeeMe from November 4 to November 11, 1994.

DIALOGICAL DRAWING, 1993-94

Two identical pieces hang on the wall: one at the Museu de Arte Brasileira, =46unda=E7=E3o Armando =C1lvares Penteado, in S=E3o Paulo and one in Lexington. As people look at the pieces, and perhaps make comments about them to people next to them, they hear sounds coming from the piece on the wall. The "drawing" on the wall (a three-dimensional piece created with wood, wires, speakers, microphones, and circuit boards) is a bridge linking strangers in the two time zones and spaces in the remote countries. The work then becomes about the interaction of foreigners, their mastery of each other's languages and cultural references, and the conversations that might result from these interactions.

STORMS, 1993

An interactive, navigational visual text based on the Sefirotic Tree of the Kabbalah, Storms is organized in vocalic and consonantal bifurcations. To navigate through the text one is invited to click on a letter at any given time. In some instances, navigation can also take place by clicking outside the word. If the reader does not make a choice, that is, if he or she does not click on a vowel or consonant, or in some instances also on empty space, the reader will remain stationary. The piece does not have an ending. This means that one can continue to explore different textual navigation possibilities or quit at anytime by pressing the Command key and the Q key. The piece can be seen anywhere in the world after downloading through the Internet from this FTP site: convex.cc.uky.edu (pub/artsource/storms). Log on as anonymous.

[Ed: Storms was described in detail in LEA 2:6. The hyper-poem can also be found in the Leonardo Electronic Gallery.]

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< The Interactive Media Festival 1995 >

Lisa Goldman
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pam@spark.com

After 1 January 1995:
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Email: info@arcflash.com
Telephone: 415.357.0100
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The Interactive Media Festival will hold its second annual event June 5-10, 1995 in Los Angeles. Motorola is returning as the premier sponsor.

The Festival's 15-member Jury is initiating an international search for quality and innovation in the interactive arts. Jury members for 1995 are:

George Acogny
- Music producer and musician (Los Angeles, London, Paris, Dakar)
Roy Ascott

- Director, Center for Advanced Inquiry in the Interactive Arts (Gwent College, Wales)
- Mike Backes
- Co-chair, American Film Institute/Apple Computer Center for Film Videomakers
- Apple Lab (Los Angeles)
- Derrick DeKerckhove
- Director, McLuhan Program in Culture & Technology, University of Toronto
- Phil Dodds
- Executive Director, Interactive Multimedia Association (Annapolis, MD)
- Tim Druckrey
- Independent curator, critic and writer on digital media (New York)
- Yasuki Hamano
- Associate professor, National Institute of Multimedia Education (Tokyo)
- Richard Heale
- President, Australian Interactive Media Industry Association (AIMIA)
- Erkki Huhtamo
- Professor of media studies, University of Lapland (Rovaniemi, Finland)
- Joichi Ito
- Techno Culture Analyst (Tokyo and San Francisco)
- Machiko Kusahara
- Interactive media/art curator and critic (Tokyo)
- Associate professor, Tokyo Institute of Polytechnics (Faculty of Arts) (Tokyo)
- Jane Metcalfe
- Co-founder and president, WIRED Magazine (San Francisco)
- Jeannine Parker
- President, International Interactive Communications Society (Los Angeles)
- Philippe Queau
- Director of research, National Audiovisual Institute (Paris)
- Program chairman, IMAGINA (Monte Carlo)
- Jeffrey Shaw
- ZKM Center for Art and Media (Karlsruhe, Germany)
- Director, Institute for Visual Media

Competition:

The Jury will use the WWW as its primary communications vehicle. The deliberation and selection process will take place in a private section of the Festival's server called the Jury Chamber. Artists and developers in competition will participate in the creation of the Web pages representing their works. The Jury debate will continue until the Festival Gallery is selected in early March, 1995.

1995 Jury Statement:

The field of interactive media is richly varied, involving a wide range of self-contained forms and open-ended systems.

Whereas the previously separate categories of art and industry are converging, criteria for evaluating interactivity are still emergent. Therefore, the Festival Jury has been chosen for its diversity and the depth and range of its experience in the arts, entertainment, business, and technology.

Explicitly, the Jury will explore its fields of interest in search of creative works expressing new models of behavior, consciousness and culture:

- o Open systems-involving dispersed authorship, networks, artificial life, and intelligent environments, etc.
- o Self-contained forms in which the authorship of the work is clearly identified (disc-based media and installations that offer a variety of interfaces, navigational pathways and databases), etc.
- o Significant developments in the creative uses of the technological infrastructure.

Works selected for the Festival will be compelling and innovative in concept and execution. Evaluation will be on the basis of:

- o The strength of realization of concept.
- o The transformative power of the work.
- o The ability of the participant to affect the performance of the work
- o The quality of feedback in the structure of the work.

The Festival will be global in scope and in aspirations.

It is the ambition of the Festival to contribute to the advancement of interactive media as a integrative force in the confluence of cultural and economic forces which are determining the future.

The Festival will open concurrently with the Sixth Annual Digital World Conference (800/433-5200) June 5-7, 1995 in Los Angeles. Ticket information will be available after February 1, 1995.

< WWW Site at The Academy of Media Arts >

Stuart Rosenberg
 Email: stuart@khm.Uni-Koeln.DE
 URL: http://www.khm.uni-koeln.de

The Academy of Media Arts began its study programme in October of 1990. At present, it offers a four-year undergraduate programme as well as two-year postgraduate and occupational programmes in "Audio-visual Media".

The Academy of Media Arts Cologne is the only art academy in the Federal Republic of Germany embracing all areas of audio-visual media. It brings together several different areas of media which interact in practice, but are generally kept separate at other institutions of higher education. Collaboration with other academies, cultural institutions, broadcasting corporations and the media industry both at home and abroad contributes to this process of integration.

At the Academy of Media Arts, the areas of art, technology and science work in cooperation. Different forms of thought are brought together: Theory meets practical design, and technical training interacts with the artistic imagination. Great value is placed on giving the students an awareness of the social and political responsibility which they as artists, designers, directors and authors assume in their work with the media.

Audio-Visual Media programme

The Audio-Visual Media programme encompasses a wide variety of subjects. According to their intended area of specialization, students may individually choose from and combine the following areas of study:

- Film and Television
- Media Design
- Media Art

In all these areas, both teaching and research share an interest in art in the age of its technological (re)production.

Students are encouraged to work in experimentally creative ways while acquiring technical competence in their respective media. For this reason, the curriculum centers primarily around studio and lab work in conjunction with specialized seminars. This diversification will be backed up by a series of basic seminars and lectures providing an integrated look at the historical and theoretical foundations of audio-visual media.

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	LEONARDO DIGITAL REVIEWS	
	DECEMBER 1994	

Editor: Roger Malina
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Axel Mulder, Simon Penny, Clifford Pickover, Benjamin Pierce,
Sonya Rapoport, Richard Ross, Jason Vantomme,
Christopher Willard, Stephen Wilson, Mason Wong.

< CDROM Review: Bio-Morph Encyclopedia:
Muybridge by Nobubiro Shibayama >
(For Macintosh) 4-D company 17-70 H Bld 4F #150 O-H Bldg. 4F 7-7
Ubuissudani-Machi, Shibuta-Ku, Tokyo, Japan 150. Fax 03-5489-3878

Reviewed by Stephen Wilson, Conceptual Design/ Information
Arts, San Francisco State University, San Francisco, CA 94132

Bio-Morph Encyclopedia is a beautiful and provocative work for CD-ROM that explores some new art possibilities made possible by new technologies. It creates a new form of art that investigates the synthesis of educational information with interactive multimedia poetry. At one level it is a presentation of historical information, the pioneering photographic studies of animal and human motion by Edward Muybridge at the end of the 19th century. At another level it goes beyond the Muybridge material to consider the philosophical and poetical implications of our culture's attempt to unravel the mysteries of time. The preface to the introductory booklet that accompanies the CD-ROM explains the approach:

"Even though being accused of being a murderer, an Englishman photographer, Muybridge kept taking still photographs of man and animals in motion. Based on plates of his photographs, but from different perspective with our original and unique techniques, penetrating his thoughts and philosophy, Bio-Morph Encyclopedia is born. We had not focused on his records of photographs, but rather on the indistinct time that were lost between the shots of sequential frames. Mysterious as if man and animals are moving and sifting through shadowy and obscure time and spaces. Twisting and warping the time to travel from the past to the present, from the present to the

future, you will find many discoveries that you never imagined."

Concretely the CD ROM presents a Victorian visual environment that looks like scanned Victorian books. The pages present reproduction of many of Muybridge's photographic studies of men, women, and animals in motion. There are also visual descriptions of the technical set up that Muybridge used. The viewer can interactively move about the environment at will. It varies from a strictly historical presentation, however, in the capabilities it offers the viewer to animate the photos and even to morph one set into another. The sounds that accompany the motion add an exotic level that suggests the overriding poetic intent.

Some elements of the interface are the least successful aspects of the work. The artist has attempted to eschew most of the customary interface conventions for interactive work such as labels, buttons, directions etc. These omissions contribute to the visual unity of the work but they can leave the viewer lost about the possibilities of the work. Even after reading the instructions and spending some time exploring, I have still not found some of the elements of the work. We must applaud the artist's attempt to explore new interface conventions, but more work is needed.

< Exhibition Catalog Review: Aligi Sassu, Pinturas 1927-1990 >
Catalog from an exhibit of paintings at the Centro de Arte y
Comunicacion, Buenos Aires, Argentina, August 24 -
September 24, 1992. With texts by Fabio Magalhaes,
Giulio Carlo Argan, and Werner Spies.

Reviewed by Paul Hertz
(E-mail: paul-hertz@nwu.edu)

A member of Corrente, an association of anti-Fascist artists formed in Milan in 1938, Aligi Sassu (1912 -) began his artistic career with clear influences of the Futurist aesthetic, but developed a mature style of expressionism with notable influences both of social realism and of the Italian baroque. In both tendencies, his work may be seen as a repudiation of the nationalistic Novecento movement, and the adjunct official art of the period.

After an early figuration with flat, vibrant areas of color, of which the "Red Men" and "Dice Players" are the best known series, Sassu developed a series of cafe and conversation pieces of more exacting representation, within a space defined by color rather than by deep perspective or dramatic illumination. His mature style aims not so much to quote from the baroque, as to interrogate it from a contemporary perspective, linking the Biblical and mythological subject matter to contemporary political events. The flow of light, shadow, and theatrical gesture of the classical baroque becomes a current of colored substance, paint molded by physical gesture. In the mid-1970s Sassu began working with acrylic media, particularly for landscapes, exploiting the luminous color, decalomania, and impasto effects of the medium. His later figurative work continues to draw on classical mythology, now freed of topical references.

Sassu's figuration anticipates the post-modern "rediscovery" of figurative expressionism by the Italian Transvanguardia and German Neo-Expressionists, and points to the breadth and diversity of currents cohabiting with the historical avant-garde. In a period when the avant-garde pines away on

the bed of past glory, these currents surface again with renewed vigor, ready to minister to the homesick.

< Book Review: Les Riches Heures de l'Alphabet >

by Henri Chopin and Paul Zumthor, Editions Traversieres, 1992, 202 pp. ISBN: 2-903551-10-3. 240 FF.

Reviewed by Marc Battier
(E-mail: bam@ircam.fr)

Based on the simple theme of an illustrated alphabet, this is rare book: having been written by two poets.

Henri Chopin is known for his sound poetry and audiopoems. He is also an active visual artist, and he deals with similar themes in both his sound poems and his visual works. For example, among Chopin's activities are numerous typewriter poems. In the vein of visual poetry, he designs elaborated constructions on his typewriter, each work being devoted to a specific theme. There is always a particular energy channeling through his work, and this book is no exception to that rule. The book was co-authored by Paul Zumthor, a poet and scholar known for his work on medieval literature. Zumthor, with a fascinating virtuosity, chooses words related to the current letter being treated, and in so doing, plays with ideas. All his verses are presented in a visual manner on the page, and often mingled with bits of Chopin's typewriter poems.

Zumthor's work in this book is based on letters, in terms of their alphabetical function). The poems he creates extend the letters into the realm of words and ideas. As a complement to this, Chopin's approach is based on the vocal, or sonic, aspects of the letters. As a result, one familiar with Chopin's poetry performances can almost listen to the printed page.

Les Riches Heures de l'Alphabet should be of particular interest to readers of Leonardo Electronic Almanac and Leonardo Digital Reviews: the book's style -- a mixing of the ancient art of calligraphy and a contemporary display of poetry -- navigates between both visual and sonic aspects of the alphabet.

< Book Review: Engineering and the Mind's Eye >

by Eugene S. Ferguson, MIT Press, 55 Hayward Street, Cambridge, Massachusetts 02142. U.S.A., 1992. 241pp. \$24.95. ISBN 0-262-06147.3

Reviewed by Stephen Wilson, Art Department, San Francisco State University, San Francisco, CA 94132

Engineering and the Mind's Eye, written by Eugene Ferguson, an emeritus professor of the history of science at the University of Delaware, challenges several assumptions often made about engineering. It highlights the over reliance on mathematics and analytical thought over intuition and non-verbal thought in contemporary engineering. Presenting fascinating historical documents of engineering from the last five centuries, it shows the importance of visualization and drawing in the development of engineering solutions to problems. Other sections show the importance of hands on experience in building a repertoire of ideas, images and impressions that prove essential in the solving of problems encountered years later.

The book also demonstrates that many of the problems encountered by engineers call for non-technical decisions that can not be derived from existing science. Engineers must often function as designers and inventors in coming up with new ideas. Ferguson notes that contemporary engineering education increasingly relies on mathematical analytical approaches at the expense of hands-on and case study design. He suggests that many notorious engineering failures such as the Hubble Telescope and the Hartford Coliseum roof collapse derive in part from these shortcomings in current engineering practice.

Leonardo readers will especially appreciate this book because the challenges facing artists who work with scientific and technological concepts share some common ground with engineers. They must both work out the relative balance of visionary design, intuition, and sound science. Ferguson does a masterful job of presenting these issues backed up by extraordinary historical documents. Perhaps the major shortcoming is over advocacy. One does not get a good feel for the countervailing arguments that critics might raise about the role of analysis and scientific knowledge in good design. Nonetheless, the book is strongly recommended

< Book Review: Digital Mantras:

The Languages of Abstract and Virtual Worlds >

by Steven R. Holtzman, MIT Press, 1994, ISBN 0-262-08228-4

Reviewed by Paul Hertz
(E-mail: paul-hertz@nwu.edu)

"What we hold for laws are perhaps only laws which permit us to understand, but not the laws which are the foundation for a work of art."

-- Arnold Schoenberg, Harmony

In Digital Mantras, author Steven Holtzman guides us through a labyrinth whose architecture continually shifts, appearing now as words, now as form and color, and again as music or binary code. He argues that "visual art, music, mathematics, mantra, numbers, and form are all investigations of structure," whose essential nature is linguistic. Without supplying a map, he nevertheless makes a convincing case that all these architectures might be a single labyrinth, a "deep structure" derived from the nature of language itself and its imbrications in the human psyche. From this insight he derives creative, aesthetic, and mystical implications where the computer appears as the ultimate manipulator of structures.

For the clarity with which it weaves together separate strands of discourse in the history of linguistics, musical composition, abstract visual art, and the evolution of computing devices, Digital Mantras deserves serious consideration as a work of intellectual synthesis. Holtzman begins with the work of the early Sanskrit grammarians and a concise introduction to Western music theory, then proceeds to the ground-breaking investigations of Wassily Kandinsky, Arnold Schoenberg, and Noam Chomsky into formal systems for visual art, music, and language. He sees in their work the foundation for later "structure manipulators," such as Terry Winograd, Pierre Boulez, Iannis Xenakis, and Harold Cohen. He places the apogee of structuralist discourse in the digital world, where binary code may represent mathematical concepts, images, sound, or motion, whose separate grammars can unite in a virtual world. Within virtual worlds, isomorphic structures can leave the realm of abstract symbols and become manifest simultaneously in different sensory streams.

Flushed with the new wine of VR, he dances from inquiry to speculation. We are pleased to accompany him, though a critical reader must revert to sobriety after the ball. He argues that if "music is the fusion of form and emotion in sound," (p. 254) emotion itself is a structure, electroencephalic in nature. Hence, structuralist inquiry applies not only "to all systems of expression," but to our experience of expression, too. Holtzman imagines that VR some day "will directly evoke the experience of what we feel and what we emote." (p. 209) Perhaps so--but doesn't art already do just that through its culturally acquired codes of interpretation? Even if an artist could present us with the very stuff of emotion, it would still be in the guise of language, an exterior form which we transform to an interior meaning. Emotion, whatever its biological manifestation, is also a situation, an intentional state whose object is social. Structuralism has successfully illuminated the morphological and syntactic aspects of symbolic systems; it sheds less light on their semantic and pragmatic aspects, which are the realm of meaning. Aware that meaning is a tricky philosophical knot, Holtzman wonders if structuralist methods can untie it. Meaning emanates from the system, but meaning is not just a matter of form--or is it, he asks. Perhaps meaning derives from a cultural totality, or from transcendental insight. In post-structuralist discourse, the meaning of a linguistic utterance (a text) appears to be so bound to the context of each individual act of interpretation that structural analysis alone cannot account for its emergence and evolution. The epistemological cut necessary to make a structure emerge as an object from its linguistic substrate may well leave the experience of meaning behind, within the subject.

In the arts, formal systems may be no more than scaffolding and catwalks, dispensable once the architecture of an artwork emerges. Schoenberg suggested, in his monumental textbook *Harmony*, that the formal system we use to understand and produce music is not necessarily the fundamental structure or impulse from which music arises. Structures beget structures. The transformations which produce structure may themselves be structured by other transformations. Having once started the hare of meaning, we may pursue it ever deeper and higher, to ever finer granularity or to overarching totality. Holtzman concludes that formal systems may be the vehicle for mystical insight, a form of mantra, leading us from surface appearances to deep structure and thence beyond structure to Brahman. In this conclusion, he points up one of the principal historical difficulties of structuralism, which has not only served as a method of inquiry, but as a critical assault on other tendencies. Structuralism rejected the atomistic approach of empiricism, with its emphasis on the accrual of motes of data that become schematized within a causal, diachronic frame. To this it opposed a model for the behavior of systems governed by constraints and transformations such that their internal, synchronic relations remain consistent--in effect, a cybernetic model. Within linguistics, psychology, ethnology, and mathematics this model has led to the creation of formal descriptions of the behavior of specific systems. While these formalizations frequently become identified with the systems they describe, they are built on the premise that structure exists independent of its formalization. But what then is the nature of structure? If we regard it as more than an abstraction, yet immaterial, we easily fall into Platonism, assigning to structures the role of archetypes. Historically, structuralism has resisted this temptation, rejecting models of knowledge (such as gestalt psychology) where the totality of possible forms assumes an existence beyond the individual emergence of form. On the other hand, the assumption that linguistic structure may be innate, part of the brain as Chomsky asserts, cannot adequately explain the cultural formation of symbolic structures, or of the constraining processes that govern them. Structuralism attempts to

mediate between the atom and the totality. Holtzman swings for the totality. This may well be inevitable, when structuralist inquiry serves as a method for examining the arts, where structure and meaning are inseparable. Thus Kandinsky's formalization of abstract art in Point and Line to Plane develops meaning simultaneously with form: meaning is the resonance of form within the perceiving spirit.

In appraising structuralism as a method of inquiry applicable to the arts, Holtzman concerns himself with its artistic rather than its scientific possibilities. His is a romantic structuralism, a poetics of structure, a formalization directed towards the production of art rather than the production of knowledge about art. Valuable though its survey of the process of formalization in the arts may be, Digital Mantras breaks new ground in pointing to digital technology as the realm where a grand unified theory of formal systems in the arts may be developed and applied. Like any poetics that has been put into practice (Holtzman's music is available separately on a CD), Holtzman's poetics of digital structure bears the mark of his personal experience, within which he strives for universality. His originality and scope, and the lucidity with which he musters both his arguments and his provocations promise to make Digital Mantras a core text in the development of an aesthetic for the digital production of art.

< World Wide Web Site Review: Mathart.com >

URL: <http://www.wri.com/~mathart>

Reviewed by Kasey Asberry
(E-mail: kasberry@mercury.sfsu.edu)

Sculptor George Dickson's visualisations of mathematical forms will be familiar to anyone who has used Mathematical software. This site also includes Dickson's portfolios of 3-D fractals, acoustical works, computer-transformed figures, works in carved metal, 3-D books, geodesic constructions, the Unihom project and information about computer-aided automated fabrication. Dickson has worked extensively with industry to produce (on an SGI Iris computer) sculptures in metal of minimal surfaces.

Mathart.com could have been organized more effectively with less text on the top level, but offers a rare wealth of mathematical imagery fascinating to the professional as well as the curious.

< World Wide Web Site Review: Avi Rozen >

URL: <http://www.technion.ac.il/people/avi-rozen/> >

Reviewed by Joseph Squier
(E-mail: joseph@ux1.cso.uiuc.edu)

There are a number of WWW sites currently on the Net that have obviously been created by people whose technical skills far exceed their visual sophistication. These sites are often flawed by both awkward design and uninteresting content. The Avi Rosen site falls into this category. The design aspect is non-existent, with a dozen or so images grouped without apparent order or organization. When all the images finally download, the result is disappointing. The images appear to be mostly collages onto stone slab backgrounds. The juxtapositions are either arbitrary or exceedingly obscure; with the exception of the sexual bondage image which is merely sophomoric. This site has very little to recommend it. It does have value, though, in pointing out the need on the Net for more interesting content and, in the case of WWW sites, more compelling design.

University of California Santa Cruz announces a call for SHORT algorithmic musical compositions to be performed in April 1995 as part of our annual celebration of new music. The compositions may be for small ensemble, solo performer, or MIDI piano (Yamaha Disklavier). Perhaps 30 algorithmic compositions will be performed.

HOW SHORT?

We mean REALLY short -- 15 seconds to about 3 minutes or so. SLIGHTLY longer pieces may be considered.

WHAT DO YOU MEAN ALGORITHMIC?

Our call is for musical compositions in which the set of "instructions" (algorithms) which the composer has undertaken (or given to the performers) is...

- elegantly concise, perhaps elegantly elaborated...
- integrated, whole, original...
- intriguingly transparent in the musical sound...

We hope to receive compositions as different, one from another, as James Tenney's "Chromatic Canon", Pauline Oliveros' "Sonic Meditations", Iannis Xenakis' "Atrees", and certain selections from Cage's "Songbooks" ...only SHORTER!

SUBMIT WHAT?

- o Score (and cassette tape if available), and/or a MIDI file designed to be realized on Yamaha Disklavier.
- o Program notes and a SHORT Bio. (Text-only files on MacIntosh Disk are preferred.)

Optionally: an image of a page from the score or any other abstraction representing the algorithm underlying the composition. For inclusion in the program.

- o If return of these materials is desired: a Self-Addressed, Stamped Envelope.

Instrumental parts must be available IMMEDIATELY in January if a work is selected for performance.

MAX patches designed specifically for Disklavier are welcome and will be implemented in MAX for the actual performance; but a standard MIDI file representing a sample realization of the patch must be submitted for consideration at this time.

DEADLINE?

All materials must be received no later than JANUARY 15, 1995. Please submit no more than two pieces. Selections will be made by FEBRUARY 1, 1995 by a jury of three composers.

COMPOSITION AT UCSC: Regular Composition Faculty at UCSC includes: David Cope, David Evan Jones, Hi Kyung Kim, Gordon Mumma (emeritus). Guest composer for this years APRIL IN SANTA CRUZ is James Tenney.

< Call for People who knew Lev Termen >

B.M.Galeyev

KGTU, SKB "Prometheus"

K.Marks str.,10

Kazan 420111 Russia

Prometheus Studio

Kazan State University, The International Office

1996 is the year of 100th anniversary of Lev Termenn, inventor of the first concert electromusical instrument. We are planning to hold

international conferences devoted to the date in Moscow and in Kazan (Russia). We are also discussing the possibility of collecting and publishing articles devoted to Termen. It is known that Termen lived for 10 years in the USA (see Leonardo, v.24, n5, pp.573-579 and v.27, n2, pp.31-33). We are looking for people who had meetings with him in those years and we would like to receive reminiscences about his life in America. We are looking forward to receiving responses and addresses from these persons. When we shall solve all organizing questions connected with collecting and publishing, a list of questions and conditions of publishing will be sent to those who responded to our request. The possibility exists of creating a book reprinted in English by a publishing house in USA. Please send your proposals and coordinates.

< Ylem on WWW >

Beverly Reiser
6979 Exeter Dr.
Oakland, CA 94611 USA
Tel: (510) 482-2483
Email: beverly@idiom.com

Ylem's Plenum
a browse able Art Gallery on the World Wide Web
viewable starting in Feb. 1995.

Each Artist will have:

- 1) a list of (up to 5) works (some of which may have pictures, QT movies, excerpts from texts if the artist is a writer, and/or sound)
- 2) Artist's statement (up to 100 wds, if the artist is a writer, however, this part is greatly expandable)
- 3) List of shows (up to 6)
- 4) List of publications (up to 6)
- 5) Biographical data (up to 100 wds)
- 6) contact info.

For this first "chapter" (other formats will be viable later.):

Text must be submitted in Ms Word.

Still pictures should be in GIF, JPEG or on a common mac format such as PICT, photoshop2.0 or 3.0, or TIFF. (It has to be something that Photoshop3.0 will accept, so I can convert it to a GIF in my mac.)

Sound must be submitted in .AIFF or as a QT movie and less than 10 megs
Movies must be Quicktime or MPEG and less than 10 megs.

Deadline: send by Jan 5, 1995.

< Final Call for THE ARTISTS' CD-ROM SHOW >

Mike Leggett
ARTISTS' CD-(ROM) EXHIBITION
c/- Museum of Contemporary Art
PO Box R1286
SYDNEY 2000 Australia
Fax: +61 2 252 4361
Email: M.Leggett@unsw.edu.au

Please remember that entries close on February 17th 1995.

Titles have started arriving already and are looking good - just as soon as we have the 'quorum' necessary for the Show, then the publicity machine will start-up and we'll be sending out further information. We

have already had inquiries from other galleries both in Australia and elsewhere and therefore hopefully we will be able to offer extra venues to participants.

If at all possible we would like to hold the disc until April 1995, by which time we will have made the selection and will be back to you about the next stage. If however, this is not possible, the disc will be returned to you following assessment within four weeks of receipt. If you might have delivery of a disc delayed by some unforeseen circumstance please send in as full a description as possible together with a sample on disc or photograph. An acknowledgement of receipt will be posted to you by Air Mail: from that point until you receive the material back, conditions of security and privacy will apply to your work.

If you are still in production and really don't think you will make the date we'd still like to hear about what you are doing and when you (realistically) think you will be publishing the title. Obviously an event such as this continues to generate reverberations for some time and I'd be pleased to help other people hear about your work even though we may not be able to show it this time round.

And please remember to use the address listed above - Air Mail for work coming from outside Australia. I will of course be delighted to respond to requests for further information.

There is now a WWW version of this page to which further information is attached:

URL: http://www.gu.edu.au/gart/Fineart_Online/info/cd-rom.html

< ISEA 95 Deadr Reminder >

ISEA95_Montreal
307, rue Sainte-Catherine Ouest #310
Montreal, QC
Canada H2X 2A3
Tel: 514-990-0229
Fax: 514-842-7459
Email: isea95@er.uqam.ca
ftp anonymous: [isea95.com.uqam.ca](ftp://isea95.com.uqam.ca)
URL (Mosaic, Lynx): <http://isea95.com.uqam.ca>

6th International Symposium on Electronic Art
Montreal, September 17-24, 1995

ISEA 95 organizers in Montreal wrote to remind LEA readers about the upcoming deadlines for submissions in the various categories:

Proposals must be received at the latest by the following dates:

January 15, 1995
Workshops
Exhibitions of Visual and Media Art
Music, Sound Art and Multimedia Performances
Emergent Senses' Cafe, Network Art and Other Special Projects.

March 1, 1995
Papers and Round Tables, Poster Sessions.

April 24, 1995
Electronic Cinema.

June 1, 1995
New Art Marketplace.

The complete application form is available on the MIT Press file server in both text and Mime-encapsulated formats (iseaform.txt and iseaform.mime, respectively).

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| PUBLICATIONS |
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< Elsevier begins its World Wide Web Service >

ELSEVIER SCIENCE B.V.
P.O. Box 211
1000 AE Amsterdam
The Netherlands
E-mail: nlinfo-f@elsevier.nl

Elsevier Science, the scientific communications branch of Reed Elsevier, started its official World-Wide Web and Gopher service.

The WWW [<http://www.elsevier.nl/>] service initially provides:

- The Elsevier Science Internet Catalogue of Journals and Books.
- Information about - TULIP - The University Licensing Program, a research project Elsevier Science is performing with nine universities in the USA.
- The Proceedings of the WWW' 94 Conference (May 25-27, 1994), organized by CERN, Geneva.
- A number of current awareness services on diverse areas of science.

< JAC Online >

The editors of JAC, a journal of composition theory, have just developed a beta version of the journal that is available on the WWW at the following location:

<http://nosferatu.cas.usf.edu/JAC/index.html>

JAC Online is a hypertextual version of the journal's traditional bound format, meaning that it is (probably?) the first major journal in the field of rhetoric and composition to be available in its entirety in both electronic and print formats.

JAC Online is accessible through WWW browsers such as Mosaic or Lynx. The version located at the above WWW site is a prototype that the editors wish to use as a guide for establishing a permanent format for JAC Online--please send any feedback, questions, or recommendations to Todd Taylor at <taylor@chuma.cas.usf.edu>.

Only the latest issue (14.2, Fall 1994) is currently available through JAC Online. Release dates for upcoming and archived issues remain to be determined.

< The Duchamp Effect, A Special Issue of October >

JOURNALS PUBLICITY
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Cambridge, MA 02142-1399 USA
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OCTOBER

Number 70, Fall 1994

__The Duchamp Effect__, A Special Issue

The back cover of OCTOBER's latest special issue appropriately features a black-and-white, 1966 photograph of Andy Warhol filming Marcel Duchamp. Like Warhol's camera, this OCTOBER issue, entitled __The Duchamp Effect__, looks at the enduring legacy of Duchamp in late-twentieth-century art practices.

Published in cooperation with Minneapolis's Walker Art Center, __The Duchamp Effect's__ release coincides with the opening of the Walker's fall 1994 exhibition, "Duchamp's Leg," curated by Elizabeth Armstrong. Through the work of artists such as John Cage, Merce Cunningham, Jasper Johns, Robert Rauschenberg, Joseph Cornell, Joseph Beuys, Marcel Broodthaers, Katarina Fritsch, Rober Gober, Sherrie Levine, and Glenn Ligon, this exhibition examines Duchamp's legacy in artistic practices from the 1950s to the present.

Three leading scholars present critical essays in OCTOBER's __Duchamp Effect__ issue. In "What's Neo about the Neo-Avant-Garde?," Hal Foster reexamines and reframes how the past three decades' neo-avant-garde art movements relate to historical-avant-garde art movements. His new reading of this relationship questions the argument of Peter Burger's influential __Theory of the Avant-Garde__. In that book, Burger posed pre-World War II avant-garde art as tragic origin and postwar avant-garde art as failed repetition. Foster instead proposes that we read Burger's argument in reverse, along the lines of the psychoanalytic model of deferred action.

In her essay "Thoroughly Modern Marcel," Martha Buskirk considers issues raised by the exhibition, mechanical reproduction, and dissemination of Duchamp's shovel, urinal, and other fabricated readymades. Thierry de Duve also looks at Duchamp's readymades in his essay. The first English translation of the first chapter of de Duve's __Resonances du readymade__ (__Echoes of the Readymade__), this essay considers the implications of Duchamp's abandonment of painting and traces the historical reception of the readymades in American and European Conceptual art.

Besides these essays, __The Duchamp Effect__ features excerpts from 1980s and '90s conversations between issue contributors and several contemporary artists. These discussions cover the historical reception of Duchamp--from the 1950s to the present--as well as how each artist's work intersects with Duchamp's art practices.

Benjamin Buchloh's 1985 conversations with Claes Oldenburg, Andy Warhol, and Robert Morris examine Duchamp's effect on American artists in the 1960s. Elizabeth Armstrong takes up this question with Ed Ruscha and Bruce Conner. In interviews with Louise Lawler, Sherrie Levine, and Fred Wilson, Martha Buskirk discusses

Duchamp's relationship to contemporary art. The special issue concludes with contributors and editors in a round-table conversation on the Duchamp effect in Conceptual art.

Since 1976, The MIT Press has published OCTOBER quarterly. A scholarly magazine of art criticism and theory, OCTOBER focuses on the contemporary arts and their various contexts of interpretation: film, painting, music, photography, performance, sculpture, literature. The magazine reaches over 4,000 artists, arts scholars, and arts enthusiasts around the world.

ABOUT THE EDITORS

Rosalind Krauss is Professor of Art History at Columbia University. Annette Michelson is Professor of Cinema Studies at New York University. Yve-Alain Bois is the Joseph Pulitzer, Jr. Professor of Modern Art at Harvard University. Benjamin H. D. Buchloh is Associate Professor of Art History at Barnard College/Columbia University. Hal Foster is Associate Professor of the History of Art at Cornell University. Denis Hollier is Professor of French Literature at Yale University. Silvia Kolbowski is a visual artist and teaches at the Whitney Independent Study Program in New York.

ABOUT OTHER CONTRIBUTORS

Elizabeth Armstrong is Curator at the Walker Art Center in Minneapolis, Minnesota. Martha Buskirk is Assistant Professor of Art History at Montserrat College of Art in Boston. Thierry de Duve has written extensively on modern and contemporary art, with an emphasis on Marcel Duchamp's work and its theoretical implications.

Review copies are available at the discretion of the publisher. ISSN 0162-2870.

For ORDERING INFORMATION, contact the MIT PRESS JOURNALS circulation department, (617) 253-2889 (TEL), (617) 258-6779 (FAX), or JOURNALS-ORDERS@MIT.EDU.

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JOB ANNOUNCEMENTS

< Time-based Computer Artist
University of Maryland Baltimore County >

Prof. David Yager, Computer Artist
Search Committee, Visual Arts Department
Fine Arts Bldg. #111
University of Maryland Baltimore County
Baltimore, MD 21228 USA

Time-based Computer Artist
UNIVERSITY OF MARYLAND BALTIMORE COUNTY.
Assistant/Associate Professor, tenure track. Starts August 17, 1994. Salary commens w/ qualifications & experience. MFA or equivalent, extensive background in computer animation, and strong exhibition record

required. Previous University teaching experience, interest in integrating computer animation with film & video and experience with multi-media desired.

Successful candidate will maintain an active exhibition record, teach courses on all levels from foundation to graduate, and will participate in developing recently established MFA program in Digital and Imaging Arts (digital media, film, video, photography, art theory). Our teaching facilities include Macintosh labs in addition to Silicon Graphics labs running Wavefront & Alias connected via Ethernet to an Amiga based real-time video input/output system. For their own work, our faculty have 24 hour access to Imaging Research Center whose facilities include ONYX and Reality Engine SGI machines, Betacam SP video input/output, IRIS printer, over 50G disk space. UMBC is a research university located between Baltimore and Washington, D.C. Application deadline January 10, 1995. Send cover letter, resume, tapes and other visual material, 3 letters of reference, and SASE. UMBC is Affirmative/Equal Opportunity Employer and welcomes applications from minorities, woman, and disabled persons.

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| ACKNOWLEDGMENTS |
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Leonardo/ISAST gratefully acknowledges Interval Research Corporation and Thom Blum/Muscle Fish Audio Multimedia Software, for their support of Leonardo Electronic Almanac.

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| LEA
| FORMAT
| CONVENTIONS
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The following describes the format or markup conventions used in creating Leonardo Electronic Almanac. The function of these conventions is to facilitate perusal through the text, and to make it easier to create conversion programs to various text readers.

- =====: Section Heading Delineation - full line character sequence
 - ****=: Item Delineation within Section - full line character sequence
 - <: Item Title - search for the character "<" followed by two spaces
 - |_ or _|: This sequence takes you to the next SECTION TITLE.
- Item titles and author/contributor names appear exactly the same in the Table of Contents and at the location of the actual item. Section names appear in all capital letters, and with this issue will appear with all letters in sequence with no spaces (PROFILES, REVIEWS, etc.).

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| LEA
| FTP
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| ACCESS |  
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The following are the specifics about ftp access:

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ftp mitpress.mit.edu  
login: anonymous  
password: your_email_address  
cd pub/Leonardo/Leonardo-Elec-Almanac
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Files for the Leonardo Electronic Almanac Gallery are currently kept in the directory pub/Leonardo/Leonardo-Elec-Almanac/Gallery.

This is an evolving system. Check the README file for the most current information about the contents in the system, and for the most current information about all of the ftp services. Submission Guidelines and Past issues are available via ftp.

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| LEA |  
| PUBLISHING & |  
| SUBSCRIPTION |  
| INFORMATION |  
|_____|
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Editorial Address:

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Leonardo Electronic Almanac  
718 6th Street SE  
Minneapolis, MN 55414  
Tel: (612) 362-9390  
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===== < End of Leonardo Electronic Almanac 2(12) >
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