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INTRODUCTION

< This issue >

Craig Harris

The International Symposium on Electronic Art (ISEA 94) is over, and I have been hearing positive reports about the event. Roy Ascott has generously offered the article that he presented at ISEA for our LEA readers - "The Architecture of Cyberception". While some of our readers were able to attend this year's ISEA, there are many who did not, and so will benefit from Roy's 'cyberspective' and "Minute Manifesto".

We continue our development of the Leonardo Electronic Gallery this month, with contributions from John Law (Drawing on the Brain), and from Stephanie Mason & Michael Saffle (L-systems, Melodies, and Musical Structure). "Drawing on the Brain" is a runtime Hypercard stack and application directed towards developing an understanding of what happens in the brain when we draw. The Mason/Saffle abstract points to a collection of music examples (MIDI files) in support of an article which is appearing in Leonardo Music Journal, Volume 4 (December 1994). An article about the Drawing on the Brain project is also going to appear in a future issue of the journal "Leonardo".

In addition to these contributions to the Gallery, there are some new files deposited on the ftp site. Some of the files support material included in this issue of Leonardo Electronic Almanac, such as the full advance program for the ACM Multimedia '94 conference in October, and the order form for the Prix Ars Electronica publications. I also have included an extracted contents listing from the past year's issues of LEA which should help people to locate specific items without having to look at every past issue. I'll do my best to keep this up to date. I also am including the first iteration of what will become the guidelines for contributing sound and image material, either in support of articles, or as part of the Leonardo Electronic Gallery. Check the README.txt file in the pub/Leonardo/Leonardo-Elec-Almanac directory on the MIT Press ftp server for details about file names and content. The WWW-access/Mosaic resource is evolving, and should be on line during October 1994.

Stephen Pope circulates the editor's notes for the Computer Music Journal. This item is an article by Giuseppe G. Englert (Paris, France), entitled "What is Composition?". I have seen this particular item already posted on a few electronic newsletters, including Music Research Digest (Volume 9, Number 25) and the ISEA Newsletter (Number 32). I include it here

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because of its close relationship to the thread of perspectives offered by Stephen Pope in "A Taxonomy of Computer Music" (LEA 2:1), and by Stephen Bell's article "How can we talk about the aesthetics of interaction?" (LEA 2:7).

David Blair invites LEA readers to visit the Waxweb MosaicMOO, a rare opportunity to step inside of this fascinating project.

Several announcements of prizes, opportunities and publications will be of interest to LEA readers.

< Acknowledgements >
Leonardo Electronic Almanac gratefully acknowledges support from the following organizations and individuals:

Interval Research Corporation has recently awarded a grant to assist in funding LEA for 1995. This grant is particularly important to us, as it helps to establish a secure foundation for developing LEA in the next year. Many thanks to Michael Naimark for his help.

Thom Blum and Muscle Fish Audio Multimedia Software facilitated in establishing the Leonardo Electronic Almanac Gallery, providing both human and technological resources required to convert files to various formats, and to move large amounts of data around the network.

Stephen Pope (Computer Music Journal) helped to test and convert this issue's "Drawing on the Brain" profile, and also helped with Stephanie Mason and Michael Saffle's sound examples for "L-systems, Melodies, and Musical Structure".

I also would like to thank the LEA Editorial Advisory Board - Roy Ascott, Michael Naimark, and Simon Penny - for their help in locating valuable content for what is now a full year of publication.

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FEATURE ARTICLES

< The Architecture of Cyberception >

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Cyberception

We are changing radically. Body and mind, we are becoming actively involved in our own transformation. It's not just a matter of prosthetics. And it's much more than implanted organs, artificial limbs or cosmetic surgery, however necessary and beneficial such technology of the body may be. It's a matter of consciousness. We are acquiring new faculties and a new understanding of human presence. We know that to be in cyberspace (which is to inhabit both the real and virtual worlds at one and the same time) and to communicate in the cybernet (which is to be both here and potentially everywhere

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else at the same time) brings forth ways of thinking and perceiving which extend what we have believed to be our natural, genetic capabilities. We are computer-mediated and computer-enhanced. These new ways of conceptualising and perceiving reality involve more than simply some sort of quantitative change in how we see, think and act in the world. They constitute a qualitative change in our being, a whole new faculty, the post-biological faculty of cyberception .

Cyberception involves a convergence of conceptual and perceptual processes in which the connectivity of telematic networks plays a formative role. Perception is the awareness of the elements of environment through physical sensation. The cybernet, the sum of all the interactive computer-mediated systems and telematic networks in the world, is part of our sensory apparatus. It redefines our individual body just as it connects all our bodies into a planetary whole. Perception is physical sensation interpreted in the light of experience. Experience is now telematically shared: computerised telecommunications technology enables us to shift in and out of each others consciousness and telepresence within the global media flow. By conception we mean the process of originating, forming or understanding ideas. Ideas come from the interactions and negotiations of minds. Once locked socially and philosophically into the solitary body, minds now float free in telematic space. We are looking at the augmentation of our capacity to think and conceptualise, and the extension and refinement of our senses: to conceptualise more richly and to perceive more fully both inside and beyond our former limitations of seeing, thinking and constructing. The cybernet is the sum of all those artificial systems of probing, communicating, remembering and constructing which data processing, satellite links, remote sensing and telerobotics variously serve in the enhancement of our being.

Cyberception heightens transpersonal experience and is the defining behaviour of a transpersonal art. Cyberception involves transpersonal technology, the technology of communicating, sharing, collaborating, the technology which enables us to transform our selves, transfer our thoughts and transcend the limitations of our bodies. Transpersonal experience gives us insight into the interconnectedness of all things, the permeability and instability of boundaries, the lack of distinction between part and whole, foreground and background, context and content. Transpersonal technology is the technology of networks, hypermedia, cyberspace.

Cyberception gives us access to the holomatic media of the cybernet. The holomatic principle is that each individual interface to the net is an aspect of a telematic unity: to be in or at any one interface is to be in the virtual presence of all the other interfaces throughout the network. This is so because all the data flowing through any access node of a network are equally and at the same time held in the memory of that network: they can be accessed at any other interface through cable or satellite links, from any part of the planet at any time of day or night.

It is cyberception which enables us to perceive the apparitions of cyberspace, the coming-into-being of their virtual presence. It is through cyberception that we can apprehend the processes of emergence in nature, the media-flow, the invisible forces

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and fields of our many realities. We cyberceive transformative relationships and connectivity as immaterial process, just as palpably and immediately as we commonly perceive material objects in material locations. If, as many would hold, the project of art in the 20th century has been to make the invisible visible, it is our growing faculty of cyberception which is providing us with x-ray vision and the optics of outer space. And when, for example, the space probe Cassini reaches the dense nitrogen atmosphere of Saturn's satellite Titan, it will be our eyes and minds which are there, our cyberception which will be testing and measuring its unknown surface.

The cybernet is also the agent of realisation and construction, embracing a multiplicity of electronic pathways to robotic systems, intelligent environments, artificial organisms. And in so far as we create and inhabit parallel worlds, and open up divergent event trajectories, cyberception may enable us to become simultaneously conscious of them all, or at least to zap at will across multiple universes. The transpersonal technologies of telepresence, global networking, and cyberspace may be stimulating and re-activating parts of the apparatus of a consciousness long forgotten and made obsolete by a mechanistic world view of cogs and wheels. Cyberception may mean an awakening of our latent psychic powers, our capacity to be out of body, or in mind to mind symbiosis with others.

So what differentiates cyberception from perception and conception? It's not just the extension of intelligence promised by CalTech's silicon neurons, the implications of the molecular computer, or the consequences of Bell AT & T's electro-optic integrated circuit that will compute in one billionth of a second. The answer lies in our new understanding of pattern, of seeing the whole, of flowing with the rhythms of process and system. Hitherto, we thought and saw things in a linear manner, one thing after another, one thing hidden behind another, leading to this or that finality, and along the way dividing the world up into categories and classes of things: objects with impermeable boundaries, surfaces with impenetrable interiors, superficial simplicities of vision which ignored the infinite complexities. But cyberception means getting a sense of a whole, acquiring a bird's eye view of events, the astronaut's view of the earth, the cybernaut's view of systems. It's a matter of high speed feedback, access to massive databases, interaction with a multiplicity of minds, seeing with a thousand eyes, hearing the earth's most silent whispers, reaching into the enormity of space, even to the edge of time. Cyberception is the antithesis of tunnel vision or linear thought. It is an all-at-once perception of a multiplicity of view points, an extension in all dimensions of associative thought, a recognition of the transience of all hypotheses, the relativity of all knowledge, the impermanence of all perception. It is cyberception that allows us to interact fully with the flux and flow of life, to read the Book of Changes, to follow the Tao. In this, cyberception is not so much a new faculty as a revived faculty. It is us finding ourselves again, after the human waste and loss of the age of reason, the age of certainty, determinism and absolute values. The age of appearance.

Cyberception defines an important aspect of the new human being whose emergence is further accelerated by our advances in genetic engineering and post-biological modeling. The

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originating of a life, biological conception, should now also be called post-biological cyberception since the decision to initiate and process the birth of children is shifting from the so-called imperatives and constraints of "nature" to the will and desire of individuals, in consort with new technologies and regardless of their age or sexual performance.

We are at the dawn, not just of a new body but a new consciousness, which in turn will demand a wholly new environment, massive urban transformation, a reconsideration of every aspect of the zones of living. Cyberception impels us to a redefinition how we live together and where we live together. In this process we must start to re-evaluate that material matrix and cultural instrument of society which we have for so long taken for granted: the city.

Architecture.

The problem with Western architecture is that it is too much concerned with surfaces and structures and too little concerned with living systems. There is no biology of building, simply the physics of space. What we might call the edificial look is all. The city is seen as a battle zone in which this or that architectural genre or idiomatic impulse fights to survive. It's a matter of relative inertia. The classicists wishing to protect the total inertia, political and cultural, of a stylistic past, the modernists protecting the privileged inertia of a stylised present. No one is interested in radical change, or intimations of the future. Edificial images, superficial surfaces define the contemporary city. But to its everyday users, a city is not just a pretty facade. It 's a zone of negotiation made up of a multitude of networks and systems. What is needed is designers of such spaces who can provide forms of access which are not only direct and transparent but which enrich the city's everyday business and everyday transactions. The language of access to these processes of communication, production and transformation is more concerned with systems interfaces and network nodes than with traditional architectural discourse. And, without the fundamental understanding, on the part of planners and designers, of the human faculty of cyberception and its implications for transactional behaviour, the cities will remain the arid and unwelcoming tracts of modernist glass and concrete or tacky post modernist folly that we are generally forced to endure. We need to reconceptualise the urban strategy, rethink architecture, we need bring into being the idea of zones of transformation, to accommodate the transpersonal technologies that are shaping our global culture.

Cities support and embody the interactions of people, the arts add value to such exchange. Today it is predominantly electronic systems which facilitate our interaction and connectivity, and the art of today is based on such systems. Cities can be dynamic, evolving zones of transformation, just as interactive art itself is about transformation and change. And just as cities can offer rewarding complexities of buildings and streets to navigate, leading to surprises, delights, mysteries, beauty, and are, at their best, about human dreams and human fulfillment, so interactive art urges you to navigate its many layered multi-media realities. It invites you to immerse yourself in its cyberspace, to get on-line to its global networks. If it is through recent

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innovations in art and science that we have become aware of cyberception, it will be cyberception at the level of city planning and architecture that will lead us to the city of the 21st century. As has already been argued in this journal, art is no longer about appearance, and certainly not about representation, but is concerned with apparition, the coming - into- being of what has never before been seen or heard or experienced.

Cities which are no more than a set of representations function badly. Their buildings may speak "hospital", "school", "library", but unless they articulate these meanings within integrated, cybernetic systems, they lie in their teeth. And too many buildings lie in their teeth. Their monuments, unless they invite the recreation of the past by means of interactive media, are no more than inert witnesses to the duplicity of official history.

Cities work best when they are constructed to empower their citizens to find fulfillment . Such urban aspirations call for the support of an art which is less concerned with representation and expression and more concerned with radical construction and imaginative realisation. This is the art which is presently emerging out of the fusion of new communications and computer media. It builds on the complexity and diversity of dreams and desires that our multi-cultural, multimedia world brings forth. Just as we call this art interactive , the enriching environment which our cities must become should be based on the same principles of interaction and connectivity.

The city in the 21st century must be anticipatory, futures oriented, working at the forward edge of contemporary culture, as an agent of cultural prosperity, as a cause of profitable innovation rather than simply as an effect. of the art and products of a former time. It should be a testbed for all that is new, not just in the arts but in entertainment, leisure, education, business, research and production.

A city should offer its public the opportunity to share, to collaborate, and participate in the processes of cultural evolution . Its many communities must have a stake in its future. For this reason, it must be transparent in its structures, its goals, and its systems of operation at all levels. Its infrastructure, like its architecture, must be both "intelligent" and publicly intelligible, comprising systems which react to us, as much as we interact with them. The principle of rapid and effective feedback at all levels should be at the very heart of the city's development. This means highspeed data channels crisscrossing every nook and cranny of its urban complexities. Feedback should not only work but be seen to work. This is to talk about cyberception as fundamental to the quality of living in an advanced technological, post-biological society.

Just as architects must forget their concrete boxes and Disneyland decorations, and attend to the design of everything which is invisible and immaterial in a city, so they must understand that planning must be developed in an evolutive space-time matrix which is not simply three dimensional or confined to a continuous mapping of buildings, roads, and monuments. Instead planning and designing must apply connectivity and interaction to four quite different zones:

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underground, street level, sky/sea, and cyberspace. Instead of the planner's talk of streets, alleyways, avenues and boulevards, we need to think of wormholes, to borrow a term from quantum physics, tunneling between separate realities, real and virtual, at many levels, through many layers. Similarly the paradigms and discoveries of Artificial Life science must be brought into play. The architect's new task is to fuse together material structures and cyberspace organisms into a new continuum. Architecture is the true test of our capacity to integrate into humanly enriching zones and structures, the potentials of the material world, the new consciousness, and virtual realities. In this enterprise many traditional ideas must be jettisoned, ideas whose inherent instability was always implicit in the dichotomies by which they were expressed: urban/rural, city/country, artificial/natural, day/night, work/play, local/global. The boundaries on these ideas have shifted or eroded altogether.

The city as an amalgam of systems interfaces and communications nodes is likely to be much more supportive of creative lives and personal fulfillment's than the grossly conceived and rigidly realised conurbations of the industrial age. In place of their dense and intractable materiality, we can expect the environmental fluidity of faster- than- light pathways, intelligent surfaces and structures, and transformable habitations. The end of representation is nigh! Semiology is ceasing to underpin our structures. Buildings will behave in ways consistent with their announced function, rather than speaking their role by semiological implication. Appearance is giving way to apparition in art, and notions of unfolding, transformation and coming-into-being are suffusing our culture. It will only be with the understanding that buildings must be planted and 'grown' that architecture will flourish. It's a growbag culture that is needed, in which seeding replaces designing. Architectural practice should find its guiding metaphors in horticulture rather than in warfare. Ultimately we can perhaps talk about pollination and grafting.

Building, like cities, should grow. But without cyberception, the traditional architect and urbanist have no idea whatsoever of what we are proposing. To see that technology changes, that building methods, economies, and planning systems change, but to fail to recognise that human beings also are radically changing, is a grave error. Perhaps classes in consciousness and gardening should replace the study of classical orders and historical canons of style and genre which stultify architectural education!

Where is there a building, much less a city, which supports a cyberculture, that sees cyberception as central to human sense and sensibility? Where is there an architectural school which is, as a whole, united body, determined to create the conditions for the proper evolution of a truly 21st century city? Where in architecture and planning are connectivity and interaction taken as primary principles of the design process? The debate in architecture should not be a matter of either/or. Either classical or modern, either new or old, either idealistic or pragmatic, either functional or frivolous. Between idealism and pragmatism, between conception of the desired and perception of the possible, lie the evolutive initiatives of cyberception .

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As a frustrated HyperCard programme might say, "Where is Home?" Where will we cybernauts of the turning millennium live? What is the nature of community and cohabitation in a telematic culture. How is cyberspacial transience to be accommodated? Where are those zones that we can cyberceive as beautiful and fulfilling. We inhabit material forms with psychic dimensions set in the limitless boundaries of cyberspace. We are networked to the universe, our nervous systems are suffusing the cosmos. We navigate inner and outer space. We don't need buildings so much as we need ourselves to be built, or rebuilt from the genetic foundations which we are rapidly re-evaluating and may soon restructure.

Perhaps the most radical challenge to the old ideas of architecture comes from the consequences of telepresence, the disseminated self. When human identity itself is undergoing transformation, the collaborative mind and the connected consciousness replacing the unitary mind and solitary consciousness of the old order of Western thought, architecture must look to new strategies if it is to bring useful ideas about living and interacting in the world. Telepresence is the province of the distributed self, of remote meetings in cyberspace, of online living. Telepresence means instant global interaction with a thousand communities, being in any one of them, or all of them, virtually at the same time. Telepresence defines the new human identity perhaps more than any other aspect of the repertoire of cyberculture.

Contemporary architecture and shopping have become more or less the same thing. Architecture, having turned its back on the need for radical responses to the realities of the teleself and distributed presence, constitutes little more than a shopping cart world of boxed packages, wheeled around the sterile zones of a mall culture. Each building is a prettified and packaged product, each component mail-ordered from a catalogue. The "have a good day" code of building practice has put the appeasement of tradition before collaboration with the future. But the need for an architecture of interfaces and nodes will not go away. We shall increasingly live in two worlds, the real and the virtual, and in many realities, both cultural and spiritual, regardless of the indifference of urban designers. These many worlds interconnect at many points. We are constantly on the move between them. In the creative zone, transience and transformation identify our way. Hi-tech chic and Bauhaus bluff will not fool our keen cyberception. Change must be radical. The new city, both in its visible immateriality and its invisible construction, will grow into a fruitful reality only if it is seeded with imagination and vision. It is artists who can become the sowers of these seeds, who can take the chances needed to allow new forms and features of the new city to grow. It is their cyberception that equips them with the global awareness and conceptual dexterity to resee, rethink, and rebuild our world.

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< Minute Manifesto >

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In so far as it models how things fit together, either in

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nature or in society, art is as much a stimulus to contemporary behaviour as it its reflection. When, in the streets, we find warring confrontations, mindless violence or despairing acquiescence in homelessness and unemployment, we should remember that art may be as much the cause of events as their expression or representation. The objects and artifices of galleries and museums individually may or may not be potent or powerful, but the sum of cultural attitudes and social values of which they are a part, from which they come and to which they lead, and which even by their silence they support, can concretely effect the real world. Art can kill.

Art provides the clearest expression of a society's will, and its capacity for construction or destruction. It not only articulates that will, it sharpens its resolve by identifying, clarifying, and invigorating the essential issues. Even under the guise of supporting its oppositions and respecting its resistance (with exhibitions, publications and honours bestowed on its "radical" and "dissident" artists) the state will always ultimately reinforce its ideologies with the culture it protects.

In the creation of such culture, universities and academies have much to answer for. Even their ivory tower indifference is political. They have consistently valued, supported and promulgated the cult of self expression over collaborative construction, of analysis over synthesis, of specialisation over integration. We are now paying the price of that. We have a society deeply divided, lacking all coherence; and a culture which is solipsistic, self regarding and utterly numb to violence and strife in the world. Indeed to apply the very concept of "caring" to the post modernist aesthetic would evoke only the most hollow and contemptuous laughter.

With their uncritical assumption of privileged authority, most cultural and educational institutions have treated knowledge as something to be handed down, to be given out, to be inculcated and absorbed, a largely one-way process of reinforcing the status quo. Interactivity at any level is regarded with caution and suspicion. Criticism is encouraged as long as it does not lead to action. Except where public scandal hits, the learning organism itself is rarely subject to profound scrutiny. Whilst management, fiscal manipulation and the corporate plan are constantly revised, new ideas of community, self-creation or radical re-construction are rarely evoked.

But in the new sciences, whether quantum, cognitive or genetic, the view increasingly is taken that reality is no longer given, pre-defined and pre-ordained, but instead is to be constructed, bottom up, such that definition and evolution of nature and our own human identity are progressively subject to our technological intervention. Art too is becoming less and less concerned merely to represent or express. The will to rethink, reconstruct and build new realities is emerging. Art in the academies classically fails to promulgate the three axes of our humanity: connectivity, construction and love. It is precisely at the convergence of these desires that we must look for significance in the new sciences, technologies and in the emergent art of interactivity which exploits the transformative potential of new technological and post biological systems.

To counter the instability and uncertainty which appear to

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threaten our future, it is not simply a matter of creating new jobs, new tools or new investments. Political tinkering from left or right cannot halt our social sclerosis. It is a matter of creating new interfaces to the world, new organisms of learning and production, which will allow us to actively participate in our own evolution. The arts concerned with interactivity and transformation , those which are, for the most part, grounded in digital systems, can provide models of being, of collaboration and production, which may bring new thinking and vision to our spiritual stagnation and economic decline.

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< L-systems, Melodies, and Musical Structure >

Stephanie Mason and Michael Saffle
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Among musical symmetries and self-similarities are those that can be produced using Lindenmayer system (L-system) curves to generate melodies and rhythmic patterns. In 1986, Przemyslaw Prusinkiewicz introduced a simple method of producing relatively complex musical scores that incorporate a legible internal structure. Using a schema called edge-rewriting, one of the authors, Stephanie Mason, has extended Prusinkiewicz's methods to generate melodies and polyphonic structures that conform to traditional Western expectations. By stretching certain L-system curves, she has also duplicated melodic phrases associated with hundreds of pre-existing works by classical and popular Western composers. The authors discuss the possible link between the perception of musical beauty and the fractal or quasi-fractal character of music associated with L-system curves.

The musical examples described here accompany the article "L-systems, Melodies, and Musical Structure" by Stephanie Mason and Michael Saffle, appearing in Leonardo Music Journal (Volume 4, 1994).

The following files reside in the Leonardo Electronic Almanac Gallery, in the directory pub/Leonardo/Leonardo-Elec-Almanac/Gallery. Both uuencoded ascii and uudecoded binary files for the Macintosh, PC, and Next platforms are included. Information on the specific files:

Masgosp.PC, MasGosper.Mac, MasGosper.Next
- uuencoded ascii files

Masgosp.mid, MasGosperMac.midi, MasGosperNext.midi
- uudecoded binary files

This MIDI file is a musical illustration for Figure 3. It is a canon formed by playing the 0.0 and pi/2 rotations of the second iteration of the quadratic Gosper curve simultaneously.

The following two files were generated from curves created by Stephanie Mason using the adapted edge-rewriting process described in the edge-rewriting section of the article.

MasCurv1.PC, MasCurve1.Mac, MasCurve1.Next
- uuencoded ascii files

Mascurv1.mid, MasCurve1Mac.midi, MasCurve1Next.midi

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  - uudecoded binary files

The canon recorded in this MIDI file was generated from the 0.0
and pi/2 rotations of the second iteration of a self-
intersecting curve created by Mason.

MasCurv2.PC, MasCurve2.Mac, MasCurve2.Next
  - uuencoded ascii files
Mascurv2.mid, MasCurve2Mac.midi, MasCurve2Next.midi
  - uudecoded binary files

This MIDI file was created from playing the 0.0 and pi/2
rotations of a different self-intersecting curve created by
Mason.
****
< Editor's Note: What is Composition? >

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As in the past, I am circulating the editor's notes of an up-
coming issue of "Computer Music Journal" in advance of their
publication. My hope is that readers of this electronic posting
will respond with letters that can be printed in the same issue
as the note, leading to a more active debate. All readers are
invited to reply with succinct comments on the questions
brought up below.
==
What is Composition?

Giuseppe G. Englert
Paris, France

I will present below a tool for composers to provoke their
thoughts, to teach, apply criticism, and defend themselves
against criticism. This description is a "Concept" (as I will
define below) of such a tool. Since the description is
concerned exclusively with the act of creation, it ignores
purposefully the listener's perception and questions of
aesthetics; only facts that can be verified in music are
considered. No historical limitations are taken into account.

Can the composition of music, in general, be seized by
formalizations in words? Composition deals with abstractions,
even in the case of electronic music or "musique concrete." Not
only is abstract thinking always present, but quite often
composers are obliged to manipulate abstractions of
abstractions ... of abstractions. It should be possible to
attempt a formalization, at the lowest level, of work done on
abstractions.

Models, Concept, Realization

Three stages can be analyzed in the making of a composition or
an improvisation (the latter, at its best, is a real-time
composition):
        the Models;
        a Concept; and
        the Realization.

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We can find Models in remembering what has been told to us during the years of education, in observing our environmentQthe immediate one at home or experiences of traveling--everything that is met during research and study if we keep eyes and ears open for discovery.

It is obvious that observed objects are--in their totality--often too complex to be the starting point of a new work of art. We reduce the observation to a "usable" image, simplifying the recorded parameters to the scale of our artistic goal. The technical term for this process is data reduction."For example, if one examines an analysis of an instrumental or vocal sound sustained for approximately three seconds, one discovers that tens of thousands of parameter changes occur. To reconstruct (synthesize) the same sound in an acceptable way, one can reduce the analysis data to a few hundred pertinent parameters (according to a communication by Jean-Claude Risset at the conference on Musique et Ordinateur, Universite Paris-Orsay, 1983). The question is then, which parameters are pertinent and for what purpose?

A Concept is the result of an intellectual act that consists in defining abstractly something that may exist in reality. Let us assume that a work of art cannot be realized without a more or less elaborated Concept.

Realization is commonly associated with professional skill. We should consider "realization" independently of the narrow standards established by music schools. Thus Realization is the act (accurate, professional, or not) of transforming a Concept into a communicable form.

<insert Figure 1 (included below) here>

Models are elements or structures that exist in our environment or in our past; not the real objects as they exist(ed), but their image made by composers for their personal use, dimming some details that they consider as being of minor importance, emphasizing other ones. Figure 1 lists some examples of Models.

The Concept is the abstract representation (willfully conceived or unconsciously springing into thought, held in mental memory or developed on paper or other media) of what the Realization is going to be. Its elaboration, from the chosen Models aiming at the Realization, is the core of composing activity. Colleagues who do not use computers for making music almost certainly would prefer the more poetic expression "vision" for this stage of composition.

There are three aspects of a Concept:

- A. Concept of a working process:
  1. Free improvisation
  2. Organization according to the chosen means for realizing a sound event
- B. Concept of a musical form (see below)
- C. Both A + B

The Concept of a musical form could be:
(in reference to the Model):

- A chosen Model
- Negation of a chosen Model

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Emphasis of one chosen Model over another
Contradiction or distortion of a chosen Model
Combination of several chosen Models

(in relationship to the Realization):
Time constraints (such as performance date and time)
Time limits (total duration and sections)
Choice of instrument (acoustical, electronic, combination of both, others)
Number and choice of performers (instrumentation)
Parameters and their hierarchy
Notation
Choice of programming language
Means of synchronization, if synchronization is wanted
Organization of sound-space, if wanted
etc. etc.

The Realization is a transcription (one of several possible) of the Concept to a means of communication. It is the final result of the composing process and takes the form of a performable score, a live performance, a recording to be presented in public, a recording for private audition, or a new not yet experienced music activity.

Chronologically, the Realization is not always the final stage in the evolution towards a music event. In many cases, especially if the Realization is communicated via a score, a performance, including the required rehearsals, adds other problems to the music making. But we can consider the ensemble of such problems as being part of one of the previous stages. In fact, they might be part of a Model, and necessarily they have to be taken into account in the definition of the Concept and in the Realization.

Appreciation of a Composition

It is obvious that the selection of Models cannot be referred to in judging the quality of the realized composition. It might influence the degree of interest of the listener. Indeed it is hard to imagine how a composition based on an uninteresting Model could captivate an audience, even if the Concept is clear and the Realization perfect. On the other hand, no matter how tempting the chosen Model, a sloppy elaboration of the Concept or the lack of accuracy in the Realization can only lead to a mediocre result.

In many writings about music, even by some reputedly serious critics or historians, one encounters often the terms “inspiration” and “influence”, the first implying a positive appreciation, the second a rather negative one. This terminology refers to the choice of Models, but does not inform the reader about the most important criterion, how the Concept has been elaborated. In other words, it does not say anything about the composition.

Figure 1. Examples of Composition Models

Models in nature:
Shapes of trees, leaves, flowers
Crystals
Nervous systems and neurons
Coastlines

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Natural laws reveled by physics, chemistry, and biology
Topography (maps of urban or natural sites)
Solar systems, comets, constellations
Acoustical data: (spectra, Fourier or other)
Acoustical environment

Models of culture(s):
Music theory
Ancient or contemporary treatises
Habits of music performance
Philosophical and/or political thoughts
Structures of society
Liturgical forms
Folk singing and dancing
Games and strategies
Literature, including poetry, prose, and vocal sounds
Rhetoric forms
Numbers, progressions of numbers, or other
mathematical proportions
Logical constructions, algorithms
Structure and technology of instruments or machines
Dramatic performances, film, video
Paintings and graphical work
Architecture
Schemes and/or exigencies of Industrial production
and last but not least: Music

Nil (absence of Models):
Since tradition and innovation are synergetic in forming culture, it is
hard to imagine a work of art that does not refer to an existing model. Yet
for the sake of completeness I include this case in the scheme; one never
knows what will be discovered in the future.

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PROFILES

< Drawing on the Brain >

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Drawing on the Brain is a hypercard stack presenting an art-science collaboration and experiment using the latest brain imaging techniques. Art-student volunteers carried out drawing 'tasks' while anchored to a PET scanner, enabling the first recordings of brain activity while a subject was drawing. The research is directed towards developing an understanding of what happens in the brain when we draw.

Much has been written by artists and scientists about drawing and the brain, but this is the first study in which one of the keenest tools of science - the Positron Emission Tomography (PET) Scanner - has been employed to look directly at the human brain while its owner is drawing. The user is invited to browse the stack and become familiar with the techniques employed.

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First you will see the limitations imposed by the apparatus, where the volunteer, flat on his back, is stuffed into what looks like a giant washing machine, with one arm attached to a water line, and has to remain still, without moving his head for two and a half hours. Little wonder that our drawing tasks became ever simpler as the reality of the experimental situation pressed upon our initial ambitions. Brain images are shown and the linked stack "slices" animates some of this material. (screen 11) The stack shows some of what goes on behind the scenes of a PET study, and on screen 12, a selection of reference material is available. Detailed results will be published in a forthcoming issue of the journal "Leonardo".

Results
We have used Positron Emission Tomography (PET) to obtain functional brain images of six volunteers while they performed very simple drawing tasks.

Three tasks were used.
1) A series of simple geometric figures were drawn (by moving a pointer held in the right hand) in one specified plane.
2) A single specified figure was drawn repeatedly, but the plane in which the drawing was made varied between three possible orthogonal positions.
3) The volunteer made the same drawing movements as in 1) and 2), by tracing round a series of geometric figures presented by the experimenter.

Twelve scans were performed giving four replications of each of the three tasks.

The rationale for this experimental design was as follows. In task 1 the volunteer had to generate for himself the movements appropriate to different forms. In task 2 he had to generate movements appropriate to different positions in space. In task 3, which was supposed to be a control task, movements appropriate to form and position were elicited by the drawing provided by the experimenter. By comparison of the pattern of brain activity associated with each of these tasks we hoped to be able to distinguish the areas involved when the hand is used to generate forms from those involved when the hand explores different positions in space.

Dr. Bottini has now completed the analysis of these data. It is clear that our control was not ideal since it was not sufficiently similar to the two experimental tasks . Nevertheless, comparison of the two experimental tasks has revealed very interesting results. We have identified one area concerned with generating forms (left middle temporal lobe) and a different area concerned with generating position in space (bilateral parietal lobe). The areas we have identified are essentially the same as those previously shown to be associated with the perception of form and position in space when no movements are made and the volunteer simply looks at objects. This intimate association between perception and production has interesting implications for brain function in general and conceivably might have relevance for the teaching of drawing skills.

The HyperCard Stack
This stack is the result of a collaboration between Gabriella Bottini and Chris Frith, research scientists, working in

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Richard Frackowiak's Neurosciences Group in the MRC Cyclotron Unit at Hammersmith Hospital, London, and John Law, artist and lecturer in the Faculty of Art, BCHE in Bath. Frith and Law designed the experiment, which was refined and then carried out by Bottini with the help of colleagues Eraldo Paulesu, Andy Blyth, Sean Creasy, Graham Lewington and Bruce MacKay all of the Cyclotron Unit. The brave volunteers were students of the Faculty of Art in Bath and we thank them for their skill and patience.

The HyperCard stack consists of 'DotB' & a linked animation 'Slices'. It is created using HyperCard for color Macs with 256 colors minimum (preferably 24 bit), and needs 2.5 meg memory partition, or should be run as a stand-alone applications. This uses the new HyperCard run-time engine. The current version of DotB has 5 interactive screens describing the PET scanning process, 1 screen with the drawing tasks, 3 screens of MRI/PET brain images (want to know where your left occipito-parietal junction is ?), a simple animation rising through the brain & a reference screen with quite a lot of material in it.

The "Drawing on the Brain" file can be found in the Leonardo Electronic Gallery on the MIT Press file server. There is a 3.6 MB ascii file in the pub/Leonardo/Leonardo-Elec-Almanac/Gallery that is a BinHex'd StuffIt archive (the Mac equivalent of a uuencoded compressed tar file) named DotBrain.sit.hqx. Mac users need to unpack it, un-BinHex it, and then un-StuffIt. This will result in the two HyperCard files "Drawing on the Brain" and "slices."

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< Waxweb MosaicMOO >

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The Waxweb Mosaic Moo is a network-delivered hypermedia project, based on David Blair's electronic film "WAX or the discovery of television among the bees" (85:00, 1991). It combines one of the largest hypermedia narrative databases on the current free Internet with a unique authoring interface that allows Mosaic or MOO users to make immediate, publicly visible hypermedia links to the main document.

Waxweb consists of more than 900 pages of hypertext, available to both WWW (Mosaic) and MOO users. English, French and Japanese text versions of the film's monologue will automatically be inserted into the hypertext, according to the wishes of the visitor. Mosaic users will have access to the hypermedia portions of the document, which includes the entire film embedded as 1600 color stills, 560 mpeg video clips, and 560 AIFF audio clips, including the soundtrack in English, French, German, and Japanese. This document has been created by David Blair, with invited contributions by a number of authors, and generous assistance provided by Melynda Barnhart and Anna Youssefi.

Visitors have the ability to make immediately visible links from any word to any other word, add comments to any page, and also to create their own pages (or many pages!), thus adding to narrative of the main Waxweb. By turning a MOO (text-based virtual reality) into a dynamic HTML document, Mosaic users will have the ability to use a forms-based interface to transparently write publicly visible hypertext (and hypermedia) additions to the main document. This breakthrough in Mosaic functionality has been written by Tom Meyer, with assistance from Suzanne Hader, and some coding help from Chiba.

In 1993, "Wax" was the "First Film on the Internet" (Markoff, New York Times, Business section, 5.24.93), sent out as a relatively high bandwidth multicast over the experimental multimedia backbone (MBONE). WAXWEB is an attempt to re-multicast "Wax" in a form more appropriate for the current Internet. As a narrative server available to both text

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interface and visual interface users, WAXWEB uses hybridized off-the-shelf freeware/shareware tools to demonstrate that the 5,000,000 channels are here now.

Users of WWW readers (Lynx, Mosaic) can reach Waxweb MosaicMOO at this URL:
http://bug.village.virginia.edu:7777

[Mac users note: for now, you must go to your options menu and set for HTTP 0.9]

MOO people can reach the Waxweb MosaicMOO at:
bug.village.virginia.edu 7777

FEATURES OF WAXWEB MOSAIC-MOO

The entire film "WAX or the discovery of television among the bees" as:

560 mpeg video clips (the entire film)

1600 gif color stills (available in 3 sizes dependent upon the bandwidth of your connection. Dynamic preferences allow change of size at any time. Total of 4800 stills)

560 AIFF audio clips: the entire film available with English, French, German, and Japanese soundtracks, with language change available at any time. Total of 2240 audio clips)

900 pages of hypertext (over 5000 links to date, including index links). Text material includes the script of the film in English, French, and Japanese, as chosen by visitor; 2600 paragraphs (English only) describing each shot in the film; more than 100 pages of contradictory fragments from early versions of the script; and hypertexts by 10 invited writers (Jane Douglas, Stuart Moulthrop, and others)... all meant to encourage your writing on this site!

* Immediate, publicly visible hypertext links in Mosaic through a forms-based interface. In-line links and hypertext authoring interface in MOO-space. Read-only available through Lynx, and so available to many without telnet.

*The ability to immediately add new pages in both Mosaic and MOO.

* Personal bookmarks saved from session to session.

Upcoming support for VRML, the distributed virtual reality markup language extension to HTML, which will allow spatialized access to Waxweb.

CREDITS

This project has been made possible by networked associate fellow status generously extended to the members of the Waxweb project by IATH, the Institute for Advanced Technology in the Humanities at the University of Virginia, headed by John Unsworth. WAXWEB opened to the Internet on July 24th, 1994, coincident with the opening of THE EDGE at the ACM SIGGRAPH 1994 convention in Orlando, Florida. Thanks to Jackie Morie, director of THE EDGE, two terminals and a shared T1 connection

were made available, for public-site exhibition of the network-based document. Waxweb has received partial funding from the New York State Council for the Arts -Electronic Arts finishing fund-, administered by the Experimental Television Center, Owego, NY. Software and technical assistance provide by Eastgate Systems, maker of Storyspace hypertext software. Mpeg compression hardware and software provided by Xing Technologies. SLIP access generously provided by Echonyc.com.

NOTES

Since we have the ability to change pointers to media files on the fly, we intend to mirror the media at sites around the World, to keep the load down on the MOO at IATH. Hotlinks will be published on the visitor's page pointing to the nearest media mirror. If you have some extra space on your system, and would like to help us out with our research, please consider becoming a mirror site.

This is an unfunded project (except for $500 from NYSCA).... please be patient with us as we bring everything up to full quality. We will be selling a signed, #'d CD of the dataset, playable on most every machine, in the fall, to help offset expenses. We hope to be able to setup the MOO to point to the individual user's CD for the media when that happens, but we are still in the vapor stage with that.

If you can speak German, and wish to volunteer your help to the project, we could really use your help... we need to transcribe the German voiceover off the videocassette.

BUGS

Feel free to point out problems... there are forms-based mailers available at the site (though these are still a bit buggy, sic).

You will notice some missing pictures, and when audio comes up, occasional clipped words, especially in the French/German/Japanese audio. Please be patient as we clean up the database.

Note that no PD mpeg player outside of the Xing player for Windows supports a timebase. Since this is a particular problem with the Mac, we will provide partial Quicktime support, about 100 clips or so. This should come up this week.

Note that we are going up just as MacMosaic 2.0 is in beta... there are sure to be some incompatibilities... please be patient! Don't forget to set options to HTTP 0.9 !!

Unfortunately, as far as we know, only X-users have a version of Mosaic able to publish kanji text (the multi-localization enhancement for 2.4 is available from http://www.ntt.jp/Mosaic-l10n/README.html). MOO users won't have this trouble. And of course, there is the audio.

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ANNOUNCEMENTS

< The 1995 John Fisher Memorial Prize >

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The American Society for Aesthetics and the Journal of Aesthetics and Art Criticism are pleased to announce the guidelines for the 1995 John Fisher Memorial Prize, created in memory of the late John Fisher, Editor of The Journal of Aesthetics and Art Criticism from 1973 to 1988.

The regulations for the prize competition are as follows:
i) The Prize will be in the amount of $500.
ii) The Prize is intended to foster the development of new voices and talent in the field of aesthetics. The competition is limited to those persons who have completed graduate work and are in the early stages of their participation in their profession. This definition allows the Selection Committee maximum discretion in determining the eligibility of entrants. Persons in doubt about their qualifications should consult the Editor of the JAAC in advance. Entrants should include with their entry a statement indicating how they qualify. Entry is not limited to members of the A.S.A.
iii) The judges for the Prize will be drawn from members of the current JAAC Editorial Board, as chosen by the JAAC Editor in consultation with the Board. The judges may seek advice from outside their number as they see fit.
iv) The essay may be on any topic in aesthetics understood according to the characterization on the masthead of the JAAC. The essay should be a maximum of 30 double-spaced typed pages (7,500 words) in length.
v) The name of the Prize winner will be announced, and if feasible the Prize presented, at the Annual Meeting of the Society in October 1995. The Prize-winning essay will be published in the JAAC. The Prize may not be awarded if, in the opinion of the judges, no entry of sufficient merit is received.
vi) For the 1995 competition, entries should be sent in triplicate, together with a 100-word abstract and the statement of qualifications, formatted for blind reviewing, to the Editor of the JAAC:

Submissions should be clearly identified as entries for the John Fisher Memorial Prize.
The deadline for submissions for the 1995 Prize is February 1, 1995.

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< Artists' CD-(ROM) Exhibition - Call for proposals >

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An international exhibition of work by artists using CD-ROM is proposed for the Museum of Contemporary Art (MCA) in Sydney, Australia in mid-1995. The curators of the exhibition wish to represent the diversity of practice being pursued worldwide by artists working with computers, giving particular emphasis to work that is extending the possibilities of the medium, for example its potential to alter the nature of engagement between a work and its audience. Innovative presentations by artists using CD-(ROM) of work in other media (e.g. photography, video, slide), will also be considered for exhibition. A catalogue and a variety of educational activities will be produced in conjunction with the exhibition.

The charter of the Museum of Contemporary Art is to bring to Australian audiences the most recent ideas and works in the visual arts from many cultures around the world. Since its opening in November 1991, the Museum has had a strong and varied international program. In anticipation of the future establishment an adjoining Cinematheque, the moving image in all it forms is an integral part of the Museums programs.

We request artists to submit work for consideration - please do not send original material. All work sent will be acknowledged on receipt. Selection will be confirmed in March 1995. We are also interested in receiving information about discs planned for completion in early 1995. Institutions and writers are also welcome to send information about works by artists using CD-(ROM) which they consider would be of interest to the curators. The MCA, the Australian Film Commission and the University of New South Wales are collaborating on the research for this exhibition.

Further information about the exhibition or the MCA is available on request, preferably via e-mail.
Deadline for receipt of all materials is February 1995.

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< The 4th International Biennale in Nagoya - ARTEC' 95 - International Open Competition and Exhibition >

Tomomi Sato
The Open Competition and Exhibition
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The Council for the International Biennale in Nagoya, is holding the Fourth International Biennale in Nagoya - ARTEC' 95. The theme is the fusion of Art & Technology. ARTEC' 95 will consist of three main events: The International Invitational Exhibition, the International Open Competition & Exhibition, and the Symposium & Workshop. The events will be held in the Nagoya City Art Museum and the Nagoya City Science Museum from April 28 - June 25, 1995.

The organizers include: The Council for the International Biennale in Nagoya, Aichi Prefecture, Nagoya City, The Chunichi Shimbun, Chubu Nippon Broadcasting Co. Ltd., Nagoya City Art Museum, and the Nagoya City Science Museum. Meitec Corporation is a special sponsor.

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BASIC STRUCTURE OF ARTEC' 95

International Invitational Exhibition
The Council for the International Biennale in Nagoya, Directors Group will select 15 Internationally-renowned artists to exhibit their latest works. All works by these top artists will be exhibited in the Nagoya City Art Museum.

International Open Competition and Exhibition
The intent of this exhibition is to create an opportunity for all applicants regardless of nationality, age, career. The exhibition is based on the idea of promoting and encouraging artists around the globe to express new and original ideas, by creating a stage where they can freely exhibit their works.

Symposium & Workshop
The opening of ARTEC' 95 will see the gathering in Nagoya of many artists, critics and others active in the field of art, media and technology. Taking advantage of this unique opportunity, a symposium aimed at discussing art, media and technology - How it effects the whole society- is planned. Also, a workshop by participating artists will be held.

APPLICATION DETAILS

Every moment, every minute gives birth to new ideas. It is with this philosophy in mind that ARTEC is holding the International Open Competition and Exhibition for both international and domestic applicants to demonstrate fresh and innovative works .

Works Sought
Works whose surface, body or images exemplify originality and uniqueness by means of computers, electronic music, video, HDTV, robots, new materials, holography, electronic media etc.

Qualifications for Entry
All works will be accepted excluding those works created for commercial production.

Prizes
Grand-prix: 1 Certificate of Merit - 1,000,000 yen
Second prize: 1 Certificate of Merit - 500,000 yen
Prize for Artistic Excellence: 2 Certificates of Merit - 200,000 yen
Recommendatory Prize: approx. 45 Certificates
*The winners of the grand-prix and second prize will automatically be entitled to enter as a candidate in the International Invitational Exhibition section of the next ARTEC' 97.
*All prize-winning works will be put on public display for ARTEC' 95 and receive 100,000 yen to help subsidize production costs.

Members of the Jury
Ito, Takamichi (Sculptor/Professor, Tokyo National University of Fine Art and Music)
Miyake, Riichi (Professor, Shibaura Institute of Technology)
Mori, Shigeki (Director, The Council for the International Biennale in Nagoya)
Morioka, Yoshitomo (Critic, Contemporary Arts)
Nanjo, Fumio (Critic, Contemporary Arts)

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Omura, Koichi (Professor, Osaka Gakuin University)
Takemura, Mitsuhiro (Critic, Media Arts)
Yamaguchi, Katsuhiro (Video Artist / Professor, Kobe Design University)
Yamawaki, Kazuo(Chief Curator, Nagoya City Art Museum)

1. Method of Judging
The first judging: Approximately 50 works out of all submitted demo and promotional materials, will be chosen for exhibition at ARTEC' 95.
The second judging: Works chosen for exhibition will be judged for prize and placement.
2. Application Deadline: November 10, 1994.
3. Application Fee: 8,000 yen per entry. Money transfer costs will be borne by the application.
4. Public Display of Prize-Winning Works
The selected works will be put on public display between April 28th - June 25th, 1995, at the site of the International Open Competition and Exhibition of the 4th International Biennale in Nagoya-ARTEC' 95 after the completion of the second judging. The site will be the Nagoya City Science Museum, 2-17-22 Sakae, Naka-ku,Nagoya, Japan 460
5. Schedule
10 November, 1994 - Closing date for entries
At the beginning of December, 1994 - Announcement of results of the first judging
At the beginning of April, 1995 - Period for arrival of works to be exhibited
In the middle of April, 1995 - Announcement of results the second judging
27th April, 1995 - Award Ceremony
28th April, 1995 - 25th June - Public Exhibition
****
< Multimedia '94 - Conference Preview >
Meera Blattner

For more information about Multimedia '94 or an advance program, contact:
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Danieli and O' Keefe
490 Boston Post Road
Sudbury, MA 01776-9898
Tel: (508) 443-3330, Ext. 1214
Email to: Multimedia.DOK@NOTES.compuserve.com or ACMHELP@ACM.org

Multimedia fever has gripped us! The merging of graphics, video, audio, communications, and other computer-related disciplines have resulted in a new technology called "multimedia." Its future lies in everything we see around us: science and engineering, education, digital libraries, home entertainment, arts, medicine, business, aids for the disabled, and more. Multimedia will make the world a very different place in 25 years, and will bring with it a revolution in communication as great as that of the invention of the printing press.

ACM Multimedia was formed in 1993 to bring together those working on multimedia in many disparate areas, and provide them the opportunity to learn from each other and build upon their mutual technical expertise. ACM Multimedia '94 will take place in San Francisco, October 15-20, 1994, in the Hyatt Regency

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(Embarcadero) where an estimated 500 companies located in the greater Bay area are involved in the support and development of multimedia products. Nine ACM Special Interest Groups (SIGs) have sponsored this conference to show their involvement and interest, with the cooperation of five other SIGs and the IEEE Communications Society.

The Multimedia '94 is a high level technical conference that includes papers, panels, workshops, demonstrations, exhibits, a vendor track for exhibitors, videos, an opening plenary of industry leaders, and a multimedia art exhibit. Except for the plenary sessions, there will be three concurrent tracks--one for panels and two for papers. Papers and panels focused on the arts will be presented as a separate track on Wednesday. The proceedings will be available to registrants on paper, CD-ROM, and online through Mosaic. A conference video and other demonstration videos will also be provided.

The Opening and Closing Plenaries
The opening plenary will address such questions as:
+ How will multimedia services be delivered to the home?
+ What areas offer the greatest opportunities for multimedia: games, education, home services, information services?
+ Is industry ready for multimedia?

Industry leaders from companies including Philips, Bellcore, Silicon Graphics, Bell, Lucas Arts, and TCI have been invited to be on the panel. In the closing plenary, two award winning papers and a multimedia demonstration by the Philips Company will be presented.

Panels and Papers
One panel track and two paper tracks will cover a full range of technical, artistic, and social topics. There is a rich interaction between these areas that reflects the inherently complex nature of multimedia. One panel will include a presentation by the Exploratorium Science Museum in San Francisco and the Holocaust Museum in Washington, DC. Another special panel of representatives from government labs, industry, and universities will discuss BAGNET, an ATM multimedia applications testbed that will create an information superhighway in the San Francisco Bay Area.

Courses
Multimedia '94 will offer two days of exciting courses by leaders in their fields. Five full-day and 22 half-day courses will span a wide variety of topics, including networking, digital libraries, multimedia databases, games, environments for children, desktop videoconferencing, and multimedia production.

The Ubiquitous Art Zone
The creations of seventeen electronic artists will be presented. Their work ranges from "immersive environments" and "garage VR" to narrative works on interactive CD ROM and hard drive. By their use of interactive interface technologies, the artists will invite the visitors to become participants in a shared experience.

Demonstrations
The demonstration program will feature novel research prototypes in multimedia computing and communications

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technologies. These juried and working prototypes will by exhibited at regular intervals by their creators. Time will be provided for personal interaction.

Workshops
Workshop participation is by invitation only and based on a submitted position paper. Workshop topics include telepresence in collaboration, interactive multipoint services, and multimedia databases.

The Conference Video
The conference video will feature multimedia systems in action and will be shown during the conference. It will also be available for purchase. Other demonstration videos will be free of charge.

Exhibits and the Vendor Track
State-of-the-art products from commercial vendors and publishers will be exhibited. Vendors will have the opportunity to present their products in a mini-lecture we call the "vendor track," conveniently located near the exhibit area and open to both exhibit and conference attendees.

Student Volunteers
Students have the opportunity to participate by contributing their time and effort to make Multimedia '94 a success. In return, they will receive free registration and one tutorial.

[Editor's Note: an electronic version of the current advance program has been placed on the MIT Press ftp site. The file name is mm94.program.]

****

< Research studentships still available at CAIIA >

Sally Willson, Research Assistant
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Caerleon Campus
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Newport NP6 1YG
Tel: 0633 430088
Fax: 432006

Who: artists working in electronic and digital media (installation / robotics / hypermedia / Internet etc) with good honours degree or equivalent

What: to pursue research degrees (full-time)

Where: CAIIA - Centre for Advanced Inquiry in the Interactive Arts, Gwent College of Higher Education, Wales

When: Starting October 1994

Grant: UK pounds 5,500 p.a. plus dependants' allowances

Application: Sally Willson, at the address listed above. For informal discussion with Roy Ascott, director of CAIIA, call 0633 432174 or email 100143.100@compuserve.com

Deadline mid September, 1994

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< The Art DEADLINES List >

 ISSN 1071-4391 ISBN 978-0-9833571-0-0

R. Gardner
Box 381067
Cambridge, MA 02238 USA
Email: rgardner@charon.MIT.EDU4

The Art DEADLINES List is a list of competitions/contests in the arts or related areas (painting, drawing, animation, poetry, prose, fiction, film, video, photography, sculpture, music, dance,etc). It is international in scope. Some events/items take place on the Internet. You are invited to submit items. The list is mailed twice a month, around the 1st and 15th.

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as the subject, or in the body of your email message. Subscriptions are also available by FAX to any area covered by the Internet FAX system (ask for the file FAX.FAQ if you don't know).

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PUBLICATIONS

< Call For Papers: The Journal of Aesthetics and Art Criticism (JAAC) - Perspectives on the Arts and Technology >>

Philip Alperson, Editor
The Journal of Aesthetics and Art Criticism
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Department of Philosophy
University of Western Ontario
London, Ontario, Canada, N6A 3K7
Internet: PMAYNARD@JULIAN.UWO.CA

The Journal of Aesthetics and Art Criticism announces a call for papers for a special issue of the Journal on "Perspectives on the Arts and Technology." This issue will be devoted to theoretical explorations of interrelationships of the arts and aesthetics with technologies and sciences. We invite papers that will provide, for a non technical audience, meaningful perspectives on the fine arts or on aesthetic experience in terms of technologies and sciences- -or bases for better appreciating the aesthetic dimensions of

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technological and scientific developments.

Authors might consider how standard issues and positions in aesthetics can be improved through better understanding of such interrelationships. Submitted papers may interpret current and projected developments in art, technology, and science, but may also be historical. Treatments of traditional or nonscientific technologies in connection with the fine arts and aesthetic experiences are welcome.

Suggested topics include: technological families and art media, issues of interactivity and telematic connectivity, immaterial versus materials technologies and arts, digital technologies and art, technologies of imagining and participation, technologies of art reproduction, modern art and high technology, keyboards, aesthetic coherence of techno-scientific arts, etc.

Submissions should be in triplicate and accompanied by brief abstracts.

Deadline: 1 September 1995.

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< 1994 Prix Ars Electronica Publications >

Peter Schoeber
ORF Landesstudio OOE
Redaktion Ku/Wi
Europaplatz 3, 4010 Linz AUSTRIA
Email: schoeber@uni-linz.ac.at

The following are publications available for those who could not attend this year' ARS ELECTRONICA.

VHS tape with the fourteen awarded computer animations
CD with the winner pieces in the field of computermusic
Prix Ars Electronica 1994 book, describing the new trends in computer arts and the award winning entries in the field of computergraphics and interactive art, as well as general trends in the field of computer art

Send email for more information. The order form resides on the Leonardo Electronic Almanac ftp site (filename: prixars.order).

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< International Journal of Supercomputer Applications and High-Performance Computing >

Michael Darden
The MIT Press
55 Hayward Street
Cambridge, MA 02142-1399 USA
Tel: (617) 253-2866
Fax: (617) 258-6779
Email: journals-info@mit.edu

Significant advances in supercomputing are reported in MIT Press's revamped "International Journal of Supercomputer Applications and High-Performance Computing".

For powerful supercomputers and high-performance computers, researchers are now creating programs that imitate drug molecule behaviors. Combined with other scientific and medical

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experimentation, these vigorous computer simulations may help researchers more quickly and cost-effectively discover drug treatments for diseases such as cancer, HIV infection, and cardiovascular disorders.

Detailed discussion of these important computer simulation advances appears in The MIT Press's latest issue of "Supercomputer Applications" (Volume 8, Number 1, Spring 1994--published June 1994). Furthermore, in this issue the journal's editors announce several new features for the publication. Formerly named "The International Journal of Supercomputer Applications", the publication's expanded title is now "The International Journal of Supercomputer Applications and High-Performance Computing (SAHPC). Along with this change, SAHPC's editors also plan to expand the journal's editorial scope and introduce new reader services.

Since the launch of "Supercomputer Applications" in spring 1987, The MIT Press has published the journal quarterly. SAHPC reports on international, interdisciplinary uses of supercomputers and high-performance computers. Its articles look at how researchers apply powerful computer programming techniques, algorithms, and solution schemes to calculation-intensive problems in disciplines such as biology, artificial intelligence, meteorology, aerodynamics, economics, and graphics.

When the journal premiered in 1987, worldwide government and university research centers were just acquiring supercomputers. Today, on these powerful systems researchers can perform, among other applications, massively parallel processing and high-performance computation.

In response to the need for broader coverage of these and the growing number of applications for powerful computing systems, the editors of "Supercomputer Applications" have therefore enlarged not only the journal's title but also its editorial scope and editorial board. In order to meet the needs of today's Internet-networked researcher, the editors plan the following SAHPC reader services: an electronic database of software that accompanies the journal's articles, maintained at the University of Tennessee; an online catalog of forthcoming papers' titles and abstracts (and if demanded, early versions of the papers themselves), maintained at MIT; and a library of computer visualization videos that accompany the journal's articles, maintained at The MIT Press. The editors of "Supercomputer Applications" may also eventually publish the journal in CD-ROM or electronic format as well as increase the journal's frequency from 4 to 6 issues per year.

"International Journal of Supercomputer Applications and High-Performance Computing" is for scientific, academic, and other researchers of supercomputing and high-performance computing applications in disciplines such as computer science, biology, artificial intelligence, meteorology, aerodynamics, economics, and graphics. The journal has a circulation of over 700 readers worldwide.

ABOUT THE EDITORS IN CHIEF
Joanne L. Martin is a member of IBM's Senior Technical Staff and Manager of Parallel Systems Performance Evaluation and Modeling at IBM's Highly Parallel Supercomputer Systems

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Laboratory. Jack Dongarra holds joint appointments as Distinguished Professor of Computer Science at the University of Tennessee and as Distinguished Scientist at Oak Ridge National Laboratory.

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< New Journal Announcement--Cultronix >

Email: cultronix@english-server.hss.cmu.edu

"Your machinery is too much for me..."

Cultronix is a new theoretical journal published electronically via the Internet. Unlike many other online journals, _Cultronix_ is structured to include diverse media: articles, images, sound, video hypertext and inter- active hypermedia. It does this via the world-wide web, which can be used by programs such as Mosaic, Lynx, Cello, Samba, Viola or WWW -- which may already be installed on your computer (or if not, are available free from many sites).

The first issue, dealing with the polemics of "machine" culture (thematized upon the line "your machinery is too much for me" from Allen Ginsberg's "America") will feature works by faculty, graduate students and undergraduates. Submissions have been diverse and unique, with issues ranging from the displacement of the immigrant body to waste as an industrial threshold.

The first issue is available now.

To see a more detailed description of the journal, our call for papers for the third issue, our US mail address, and the journal itself, launch a WWW application (such as Mosaic) and connect to the URL:

http://english-server.hss.cmu.edu/Cultronix.html

or you can find us through such listings as the CERN Virtual Library "Electronic Journals" collection.

If you have questions, please send e-mail to our editorial board at:

cultronix@english-server.hss.cmu.edu

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LEA FORMAT CONVENTIONS

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.).

LEA FTP ACCESS

The following are the specifics about ftp access:

```
ftp mitpress.mit.edu
login: anonymous
password: your_email_address
cd pub/Leonardo/Leonardo-Elec-Almanac
```

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.txt 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.

LEA PUBLISHING & SUBSCRIPTION INFORMATION

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