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LEONARDO REVIEWS

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LEONARDO NETWORK NEWS

Leonardo Reviews
February 2007

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This month in Leonardo Reviews we have the usual range of commentary on recent publications, films and music germane to the art/science/technology community. Unusually we are able to offer a digest of a very long review of Paul Fishewick's book Aesthetic Computing by a new member of the pane Michael Kelly. I also include a review of two pieces by Takahiko Iimura by Mike Leggett who has been an avid follower of his work in the Leonardo Review columns. Both reviews are well referenced and provide a useful resource for research. Finally I have included Jack Ox's reflections on Super Computing 2006 held at Tampa. For all the rest of the work by the Leonardo Reviews Panel and a longer version of Kelly's Review please go to our main site at <www.leonardo.info/ldr.html>

Michael Punt
Editor in Chief
Leonardo Reviews

< Aesthetic Computing >
Paul Fishwick, Editor

Cambridge: MIT Press, 2006
Reviewed by Michael Kelly, Department of Philosophy, University of North Carolina

Let me start with two brief disclaimers to make it clear what aesthetic computing is not, since it is a new field and there is naturally some unclarity about its identity. Aesthetic computing is not the application of computer artifacts – models, programs, data, codes, interfaces, and the like – to art or aesthetics. There is such a field and it's called computer art or computer aesthetics. Also, aesthetic computing is not directly concerned with the development of new art mediums such as interactive art, software art, internet art, and the like, though these mediums may enter the discussion because they embody some of the results of aesthetic computing.

Rather, aesthetic computing is about the application of the arts and aesthetics to computing. According to Paul Fishwick, aesthetic computing takes the computing discipline itself as its raw material and explores how aesthetics might productively shape computing (including programming languages, AI, HCI, graphics, visualization) (pp. 7-8)? Or in the words of Roger Malina, the aim of aesthetic computing is "to transfer ideas and techniques from the arts to computer science and engineering" (p. 44).

In elaborating on the impact and scope of this transfer, Malina highlights a dichotomy within aesthetic computing, or indeed within computing as a whole: Is the computer to be understood as a transparent "information appliance" or as a "medium for reshaping perception and cognition" (p. 44). If the computer is an appliance, aesthetic computing is a matter of design aimed at making the computer as transparent as possible so that we can achieve the desired results, such as effective communication or legible visualization. But if the computer is capable of shaping perception and cognition, aesthetic computing is a way to understand how perception and cognition can be shaped by and, in turn, shape, technology.

Following the structure of this dichotomy, Malina outlines two kinds of claim, weak or strong, that can be made on behalf of aesthetic computing, depending on whether we're talking about the design of the finished products of computer technology or the codes underlying computer software. "The weak claim is that by stimulating the flow of ideas and methods from the arts to computing, computer scientists and engineers will achieve their objectives more easily, quickly, or elegantly" (p. 47; italics added). For example, artists can demonstrate how computing devices are more likely to be adopted by the public if they are found aesthetically appealing; these insights might, in turn, inspire innovation in future research projects (with the Apple iMac or iPod often sited as exemplary success stories). By contrast, the strong claim about aesthetic computing is "that by introducing ideas and methods from art and design into computing, new practices and approaches will emerge responding to new objectives that would not naturally have evolved within the computing sciences and engineering" (p. 48). Here, the claim is that aesthetic insights gained from artistic practice do not merely allow computer scientists to achieve ends formed without taking aesthetic considerations into account but that these insights actually shape the objectives of computing enough "to redirect the future development of computing, provoking new developments and inventions that would otherwise have been impossible. A different computer science and engineering may emerge" (p. 50). This is a strong claim indeed, which Fishwick corroborates by claiming that one of the "core goals" of aesthetic computing is "to modify computer science through the catalysis of aesthetics" (p. 11).

To answer which, if either, claim about aesthetic computing can be supported, we first need to clarify what aesthetics is. Fishwick offers some clarification by dividing aesthetics into three concerns: modality, or "ways in which we interface and interact with objects"; culture, meaning genres, movements, and such in the history of the arts; and quality, referring to symmetry, complexity, parsimony, beauty, etc. (pp. 12-13). Although this division is helpful, the inclusion of "quality" (or, better, "property") requires some clarification because it determines how we approach modality and culture. So let me add yet another disclaimer. Aesthetics is not merely about symmetry, harmony, elegance, optimality, and other similar properties of the artifacts of computing, whether they are used in computing or created by it. It's not that these properties aren't relevant in aesthetic computing; it's just that aesthetics is a philosophical discipline and these properties are not, by themselves, philosophical

issues. In fact, aesthetics is not about the specific properties of any particular objects, whether works of art, natural objects, or artifacts of computing. If I can use the term 'Beauty" with a big 'B' to stand for the set of all such properties, including the particular property of beauty with a small 'b', Beauty is not a property of any object. This does not mean, intentionally or unwittingly, that aesthetics is subjective or that, as we often hear, Beauty is in the eye of the beholder. Aesthetics isn't subjective any more than it's objective, since beauty is not in the subject any more than it's in the object.

Then what is aesthetics, or, where is Beauty? In the language of eighteenth-century aesthetics, Beauty is a relational property, that is, a property resulting from relations between human subjects and certain objects in art or nature. Or, in the language of contemporary computing, Beauty is an interactive property between human subjects and the artifacts of computing. What this means is that when aestheticians take up the question of Beauty, they concern themselves with the nature and structure of the cognitive and affective relationships between human subjects and certain objects in the world, to which we can now add computers. The objects here are at the same time occasions for interactions not only between humans and objects but among humans. To take a simple example that does not necessarily involve computers, when several people take pleasure in a painting, opera, or pop song, the artwork is an occasion for these individuals to discover something they have in common. The philosophical issue this discovery provokes is what, at a deeper level, makes it possible for people to have a work of art in common. This deeper level involves human emotions, passions, and the like, as well as their effects on human perception and cognition. Insofar as aesthetics is the interdisciplinary study of the complex commonality that underlies our shared experiences of art, it is necessarily connected to other disciplines that are also concerned with human emotions, perception, and their interactions.

In contrast to this account of aesthetics, many contributors to this volume seem to attribute Beauty to artworks and thus to computers. For example, Laurent Mignonneau and Christa Sommerer emphasize complexity, diversity, and emergence as the properties in HCI, with a special focus on "users' interaction input" (pp.169-183); Jonas Löwgren identifies a set of nineteen qualities tied to HCI (pp. 383-403); Stephan Diehl and Carsten Görg understand beauty in terms of the sum of elementary properties (pp. 229-37); and, finally, Michael Leyton develops aesthetic rules: maximization of transfer and maximization of recoverability (pp. 289-313). But this focus on Beauty as a property is what I'm claiming is problematic. Beauty is a property of relations or interactions among humans (which may very well be what the above authors have in mind) rather than of the works that occasion such relations or interactions. Aesthetics is the understanding of what makes such relations or interactions possible, not just what makes them more effective, more pleasurable, and the like, though by understanding what makes them possible, we'll presumably be in a better position to address these other concerns. Aesthetic computing is the same type of understanding connected directly to computers. In a word, if aestheticians now work with computer scientists, as I now expect they will, it will be a natural extension of what they've been doing all along.

Now, to return to the weak and strong claims for aesthetic computing, it's helpful, following Fishwick, to narrow computer science to three areas and to identify what aesthetic computing might involve in each case. First, on the level of computer programming, there are questions about whether and, if so, how to represent programs and data structures with "customized, culturally specific notations." Second, there are issues about how to incorporate "artistic methods in typically computing-intensive activities." And third, in connection with HCI, there are issues about how to improve "the emotional and cultural level of interaction with the computer" (p. 6).

Fishwick provides a good example of the first case, for he argues that aesthetics will alter not only the design of computer software at the point that users begin to interface with it, but also the very programming that makes software possible (pp. 9, 13-20). The rationale for this strong claim is that programming will change as computer scientists alter their objectives as a result of attaining a better understanding of the aesthetics of HCI. Put simply, programming will have to change to create the desired interface – an obvious point, but one that is now coming with an aesthetic imperative attached. Norm Tractinsky's and Dror Zmiri's research on "skinnability" (alternate interfaces to commonly used applications) is a good

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example here because they focus on interaction, while taking consumers' interest in skinnability as evidence of their interest in the aesthetics of computing (pp. 405-22).

Concerning visualization, there are two types which fall under the general heading of data visualization: scientific visualization, which is the creation of visual representations of scientific data from physics, biology, or any of the natural or social sciences; and information visualization, which involves visual models of information from all sorts of sources: business, government, the sciences, or elsewhere. Both types involve aesthetics since visualization is, in Donna Cox's words, "the creative translation of data into visual representation" (p. 94). She provides a systematic and clear analysis of the aesthetics of visualization by explaining the basic metaphorical structure of the translation of data into visual models (pp. 89-114).

Now, some people also speak of knowledge visualization, which, if I understand it, is a meta-level of visualization that articulates the epistemological implications of the two types. For in knowledge visualization the claim is that you're not just visualizing or illustrating what is already known; rather, in the words of Monika Fleischmann and Wolfgang Strauss, "artistic works in the area of aesthetic computing must lead to a synthesis of sensory perception and cognitive insight, yielding new ways of thinking and models of experience" (p. 131). How this perceptual/cognitive interface works is a basic subject matter of aesthetics. For example, Aaron Quigley uses the expression "relational information," which is very similar to the idea of beauty as a "relational property" or "interactive property" (pp. 316-33). So there's a natural role for aesthetic computing in visualization.

Finally, in the third area of computer science, HCI, we have the following picture, to quote from Frieder Nake and Susanne Grabowski: "Interface aesthetics is different from the aesthetics of packaging," the design approach to aesthetic computing, "in that the interface to software belongs to the software. Software never appears without its interface. The human-computer interface is, first of all, the face of its software" (p. 67). In this light, the weak and strong claims about aesthetic computing would be better characterized, as they are by Jay Bolter and Diane Gromala, as the inside and outside of computers, meaning the code and the interface (pp. 369-82). So we don't have to choose between the weak or strong claims any more than we have to choose between the code and the interface. Rather, the interaction between the code and the interface is the basis of HCI and, in turn, the basis of aesthetic computing.

At the end of his introductory essay, Fishwick asks whether aesthetic computing is something new or whether it just "rehashed old material." He and his expert contributors argue that technology has developed to the point today where it is not only possible to pay attention to aesthetics, but there is now a sense of urgency coming from computing. In Fishwick's words: "We have had to wait for the technology to become available to leverage the arts" (p. 13). If this is accurate, what we have here is a new field called aesthetic computing. And what we have in this collection is an excellent contribution to aesthetic computing, an extremely valuable text for aestheticians and computer scientists alike.

References and Notes:

1. Fishwick claims that computer interface "should be as much about quality as it is about quantitative performance" (p. 21). My turn away from "quality" seems at odds with this claim. But I think we are proposing something very similar because he seems interested in quality only as it relates to the affective as well as cognitive dimensions of HCI rather than to the properties of artifacts (e.g., a computer or a graphic user interface) that would occasion such interaction.

2. Frieder Nake and Susanne Grabowski (pp. 53-70) add semiotics to the aesthetics and computing mix, apparently on the belief that aesthetics is subjective (p. 55) and needs to be offset by the more objective semiotics. As I understand aesthetics, however, semiotics does not add anything that couldn't be included within aesthetics. Umberto Eco's combination of aesthetics and semiotics is an example of what I have in mind here.

3. Jane Prophet and Mark d'Inverno (pp. 185-96) prefer to use the term "transdisciplinarity" in place of "interdisciplinarity" or "multidisciplinarity," because they think the first term emphasizes that something new emerges from the interactions among these disciplines.

4. Elsewhere [e.g., in my Encyclopedia of Aesthetics (New York: Oxford University Press, 1998) or Iconoclasm in Aesthetics (New York: Cambridge University Press, 2003)], I characterize aesthetics as critical reflection on art, culture, and nature. In this light, aesthetic computing is critical reflection on – or philosophical analysis of – the aesthetic theories, principles, beliefs, ideas, and the like underlying computing once it is governed not only by technological concerns but by artistic practices.

< John Cage Performs James Joyce >
by Takahiko Iimura
Takahiko iimura Media Art Institute, Tokyo, Japan, 1985/2005
DVD, 15 mins., B&W
Sales, $US100 (personal); $US400 (institutions)
(No ISBN)

< Fluxus Replayed >
by Takahiko Iimura
Takahiko iimura Media Art Institute, Tokyo, Japan, 1991/2005
DVD, 30 mins., B&W
Sales, $US100 (personal); $US400 (institutions)
ISBN 4-901181-24-6.
Distributor's website: http://www.takaiimura.com/home.html

Reviewed by Mike Leggett
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Taka Iimura is a senior figure among contemporary Japanese artists and has been working with film, sound and video since the 1960s. He was one of several Japanese who, coming from a 20th Century tradition of avant-garde intervention,1 contributed to the Fluxus group in the 60s. Like many media artists, Iimura made recordings of contemporaries and their work. Alongside his film and video artworks, (the video Observer/Observed reviewed in Leonardo 35.1), portable video enabled documentation, (and general note making), more economically than film. As the cycle of experimentation moves through another generation, glimpses of precursors through archive recordings of this kind help ground artists' surviving words and artworks.

John Cage (1912-1992) as the senior figure of Fluxus (NYC), active experimentally since the late 30s, is the subject of a video portrait shot by Iimura in 1985, released in 1991 and made available on DVD in 2005. Cage had a long-standing fascination with the work of James Joyce, in particular Finnegans Wake, the book becoming the basis of many works, the best known of which is the Roaratorio — an Irish Circus on Finnegans Wake. Commissioned by German radio and IRCAM in Paris the sound recording was completed in 1979, lasted about an hour and was a 62 track mix of the sounds referred to in the text, the text itself as prepared (using a mesostic system), and read by Cage, together with music played by the Irish traditional music players of the day.

Roaratorio is one of the classics of Cage's oeuvre 2 and in Iimura's 15-minute recording, John Cage Performs James Joyce, Cage presents the core of the spoken part of the work. Its composition, like many of his other works, is aided by the I-Ching. Here he briefly explains that none of the sentences (sic) in Finnegans Wake are selected, only words, syllables and letters, from different pages according to the chance decisions made by consulting the I-Ching and its representational hexagrams. In this way the 624 pages of the book are compressed into 12 pages of text, and it is one of these pages that we see him holding. He reads from it, sings it, and then, hustling close to the camera and its microphone, whispers it. At the bottom of the screen are superimposed each time, two lines of sub-titling synchronised with the text he is using.

Iimura's presence is felt but not seen, though we hear him responding to Cage's explanations at the outset. Cage's voice is not strong; he is in his seventies, and we strain to hear him against the noise of New York traffic coming through the window in the background of a sunlit room. His demeanour remains buoyant, at one point making light of a fumble he makes with a watch he is holding, an event incorporated into the flow of the tape. Like so many of his initiatives, the line between the artwork and its making is blurred, a statement aided and amplified by Iimura's collaboration in its making.

In Fluxus Replayed also released in 2005, Iimura documents an event in 1991 held to reproduce historical performances by NYC-based Fluxus artists of the 1960s. The S.E.M Ensemble together with some of the Fluxus artists themselves, perform works by Nam June Paik, Yoko Ono, Dick Higgins, George Brecht, Allison Knowles, Ben Patterson, Jackson Mac Low and Emett Williams. Iimura has edited together the sounds and images captured by two cameras as raw evidence of the goings-on, with scant regard for the conventions of continuity editing, thus maintaining the document in the space between the moment of recording and that of viewing. Time compression is only obvious in Ono's Sky Piece for Jesus Christ (1965) as the baroque instrumental ensemble are wound around with white paper, accumulating as a series of jump cuts to the point where their music is reduced to a series of bumps and scrapes, before the musicians are man-handled off the stage, still attached to their chairs and instruments.

Again, Iimura gives some idea to younger generations of how these early precursors to contemporary performance art appeared to audiences, in a setting typical of the genre — church hall ecclesiastical architecture, painted walls, wooden floor. Though much of this work was sound-based, produced collaboratively for group performance using chance determinations and framed with a sense of the aesthetics of noise, the written scores or instructions for each piece may well have satisfied many members of the audience. Glimpsed in the background, some walking around, others squirming in their seats, the probably overlong evening has been bravely foreshortened into a useful 30-minute document by the artist with the video camera.

Notes:
1. Two publications on this subject: Into Performance: Japanese women artists in New York, by Midori Yoshimoto, Rutgers University Press, 2005; Dada in Japan: Japanische avant-garde 1920-1970, by Stephan von Wiese, Jutta Hulsewig and Yoshio Shirakawa, Kunstmuseum Düsseldorf, 1983.

2. An extensive discography now exists for Cage and other sound artists, together with collected reviews, samples and the means to buy recordings at http://www.moderecords.com/main.html.

< SC06: International Conference for High Performance Computing, Networking, Storage, and Analysis >
Reviewed by Jack Ox
Jackox [at] Comcast [dot] net

How relevant is Supercomputing to artists? What kind of artist would want to go there, either to learn or to demonstrate their work to this audience? I admit that we are not yet a sizable population within the conference attendees, but would like to make a case for an expanded participation.

Consider the areas of research that are engaged in utilizing super computing technology: biology and genomics, networking and telepresence with the LambaRail, chemistry and the rational design of drugs, reverse engineering of the brain with studies on the limits of human ability. Leonardo's community including artist and scientists have been working in these areas in a very serious way for a relatively long period of time. Ray Kurzweil, the keynote speaker, asked, "Is it possible to understand our own brains?" As usual he was philosophical, and he speaks to artists as well as scientists, speaking copiously on the exponentially accelerating rate of progress, of which supercomputing is a major ingredient.

Donna Cox, with her wonderful team of scientific visualization specialists (Robert Patterson and Stuart Levy) are regulars at this conference. Their artistry is actually

part of the scientific world far more than of the art world. They were at the NCSA booth showing HD, stereoscopic visualizations of galaxies and weather systems.

But there were also artists producing performances that operate more in the traditional area of the performing arts, although using high performance networking technology for both the collaborators and the dispersed audiences. This group is lead by Jimmy Miklavcic, a multimedia specialist at the University of Utah's Center for High Performance Computing, with artistic direction by Beth Miklavcic. The group, called Another Language Performing Arts Company, re-presented their fourth InterPlay performance called Dancing on the Banks of Packet Creek during Supercomputing. Because the group is working over Internet2 they have had to choose faster communication over high resolution, employing serious video compression. But Miklavcic has made this work to his artistic advantage. The various streams, coming in from Boston University, Purdue University , the University of Maryland, and the University of Alaska, Fairbanks, all to the University of Utah, are mixed by Jimmy Miklavcic and look astonishingly like paintings with very beautifully applied surfaces and muted colors. All of the performers work in tandem with the sound, which is mostly improvised, and in return is influenced by the choices of the performers and the visual of the main mix. It was very impressive how the performers dealt with the considerable, irregular delay, known as jitter, on the still packet driven Internet2.

Miklavcic uses AccessGrid Video (Cassette) Recorder (AGVCR) to capture and record the video streams from all of the players. These files can them be played back at a later time (as they were at Supercomputing), and they can be edited via a built-in editor. This is how they are interwoven into such fascinating, painting like images. The result is not "visual music" but rather music with image. The video was compressed with H.261 compression, a standard video conference method used in the Access Grid system.

The concept behind the performance is an exploration into the "inundating wave of digital information and non-experiential knowledge" that we are subjected to during our digital lives. Each of the participants created parts on their own while thinking about the same concept. Each site contributed at least two video streams, with the music performed and transmitted from the Fairbanks and Boston locations. The performers involved in "Packet Creek" are all quite proficient in areas such as film, radio broadcasting, and dance, and also have extensive scientific and technological backgrounds including mathematics, computer engineering, biomedical engineering, digital art, and 3-D animation.

My question is how would this performance change if it were to be on the National Lambda Rail (NLR) instead of Internet2? All of sudden the video compression would not be necessary, and the sound would have little delay, with a regularity that can easily be overcome by musicians. I believe that the whole aesthetic quality would change dramatically.

Of course the NLR also had a great presence at SC06. One could sit at their booth for hours, taking in one great half hour talk after another. Tom West, the President and CEO of NLR, gave several introductions to the technology throughout the conference. We were also treated to presentations by Larry Smarr (Calit2 at UCSD)on genomic and oceanographic research over Optiputer, a member of NLR, Jason Leigh (Electronic Visualization Lab at UIC) about SAGE wall immersive technology, and Maxine Brown (UIC) on TransLight/StarLight and TranLight/Pacific Wave, the complementary efforts funded by the Nation Science Foundation (NSF) that provides the infrastructure connecting US, European and Pacific Rim research and education networks. All of this information is extremely useful to any member of our community who desires to be dancing on the very exciting edge of high performance computing and networking technology.

New Reviews, February 2007

< Cartographies of Tsardom. The Land and its Meanings in Seventeenth Century Russia>
by Valerie Kivelson
Reviewed by Stefaan Van Ryssen

< Our Daily Bread >
by Nikolaus Geyrhalter

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Reviewed by Martha Blassnigg

< Inside Out HYPERLINK "http://www.leonardo.info/reviews/feb2007/inside_harle.html" µ §>
by Zohreh Shayesteh
Reviewed by Rob Harle (Australia)

< John Cage Performs James Joyce >
by Takahiko Iimura

and

< Fluxus Replayed >
by Takahiko Iimura
Reviewed by Mike Leggett

< King of Infinite Space: Donald Coxeter, the Man Who Saved Geometry >
by Siobhan Roberts
Reviewed by Stefaan Van Ryssen

< Playing the News >
by Jeff Plunkett and Jigar Mehta, Directors
Reviewed by Amy Ione

< SC06: International Conference for High Performance Computing, Networking, Storage, and Analysis >
Reviewed by Jack Ox

< Seeing High & Low. Representing Social Conflict in American Visual Culture >
by Patricia Johnston, Editor
Reviewed by Jan Baetens

< Technology Matters: Questions to Live With >
by David Nye
Reviewed by Michael Punt

< Transitio_mx. Festival Internacional de Artes Electrónicas y Video >
by Amanda Lemus, Adriana Casas, and Lilia Pérez, Eds.
Reviewed by Stefaan Van Ryssen

To read all reviews, visit: <leonardo.info/ldr.html>

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< A Disturbance in the Flow >
By Meredith Tromble

After Midnight

< @Joburg >
By Nathaniel Stern

The Leonardo Gallery

< The Dream of Reason >

Curated by Elysa Lozano and Inês Rebelo

Including work by Tom Dale, Anthony Discenza, Frederick Loomis, Lauren Kirkman, Elysa Lozano, Inês Rebelo, Alexander Ugay and Roman Maskalev

Artists' Statements

< Himalaya's Head: Disturbed Visual Feedback in an Interactive Multi-User Installation >
By Sarita Dev and Maurits Kelder:

< The Genetic Creation of Bioluminescent Plants for Urban and Domestic Use >
By Alberto Estévez:

Historical Perspective
< 1970s Iran >
By Robert Gluck

ABSTRACT: Iran in the 1970s was host to an array of electronic music and avant-garde arts. In the decade prior to the Islamic revolution, the Shiraz Arts Festival provided a showcase for composers, performers, dancers and theater directors from Iran and abroad, among them Iannis Xenakis, Peter Brook, John Cage, Gordon Mumma, David Tudor, Karlheinz Stockhausen and Merce Cunningham. A significant arts center, which was to include electronic music and recording studios, was planned as an outgrowth of the festival. While the complex politics of the Shah's regime and the approaching revolution brought these developments to an end, a younger generation of artists continued the festival's legacy.

Special Section: Live Art and Science on the Internet

< Recipe for a Google"! Party >
By Adam Overton

< ELIZA REDUX: A Mutable Iteration >
By Adrianne Wortzel

ABSTRACT: The author discusses her on-line interactive telerobotic work ELIZA REDUX, its sources and the emblematic use of the psychoanalyst/analysand relationship as a performative vehicle.

< Wigglism: A Philosophoid Entity Turns Ten >
By Ebon Fisher

ABSTRACT: The author describes The Wigglism Manifesto, a work authored amidst the fury of early exchange on the World Wide Web. The term Wigglism refers to a quality shared by biological and artificial life forms alike. The manifesto has taken an open-source approach to its cultivation, allowing numerous voices to nurture the entity into being. This collective approach to truth cultivation embodied by the manifesto was inspired, in part, by the author's experiences with community-based media rituals in the North Brooklyn community before it gentrified in the mid-1990s. The project has affirmed its initiator's sense that cultivating a living system can be a vital alternative to traditional creative practices more aligned with manufacturing and commerce.

Color Plates

General Articles

< Formulating Abstraction: Conceptual Art and the Architectural Object >
By Therese Tierney

ABSTRACT: Digital techniques, primarily software appropriated from the entertainment and industrial design sectors, have destabilized the essential status of the architectural image-object formulated in classical philosophical thought. Western European art experienced a similar crisis when conceptual art movements of the 1960s challenged Clement Greenbergs notion of medium specificity. The author examines

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work by conceptual artists whose theories posit alternative views of spatial and social relations based on open-ended systems and indeterminacy. An examination of the relationship between materiality and abstraction as exemplified in new medias reformulation of architectural design processes, indicates how a more inclusive and mutable profession has been realized.

< A Taxonomy of Abstract Form Using Studies of Synesthesia and Hallucinations >
By Michael Betancourt

ABSTRACT: The author proposes a taxonomy of abstract form anchored in an examination of the history and theory of synesthesia and abstract art. The foundations of this taxonomy lie in empirical psychological studies of "form-constants" found in cross-modal synesthetic visions and hallucinatory states, specifically the work of Heinrich Klüver in his examinations of mescaline and the mechanisms producing visual hallucinations. While the proposed taxonomy is limited only to synesthesia-inspired abstraction, it has suggestive possibilities when considered in relation to other forms of non-synesthetic abstraction such as Islamic Art, the geometric forms found on classical Greek vases, and other kinds of decorative abstract patterns.

Special Section: ArtScience: The Essential Connection

< Niko Tinbergen's Visual Arts >
By Robert Root-Bernstein

ABSTRACT: Dolores Hangan Steinman and David Steinman: The Art and Science of Visualizing Simulated Blood-Flow Dynamics
The increasing use of computer enhancement and simulation to reveal the unseen human body brings with it challenges, opportunities and responsibilities at the interface of art and science. Here they are presented and discussed in the context of efforts to understand the role of blood-flow dynamics in vascular disease.

< A New Art Form: Exploring Nature's Creativity with a Self-Organizing Medium >
By Robert Steinberg

ABSTRACT: The author describes a new art form that uses the self-organizing potential of a water-based medium to provide an ever-changing environment for interpretation and elaboration. The medium allows for little separation between plan and execution. The artist, nature and science interact on the "canvas" to create an art rich in novelty and surprise.

From the Leonardo Archive

< Kinetic Painting: The Lumidyne System >
By Frank J. Malina

< The Cybernetic Stance: My Process and Purpose >
By Roy Ascott

Leonardo Reviews

Reviews by Jan Baetens, Roy R. Behrens, Martha Blassnigg, Dene Grigar, Rob Harle, Amy Ione, Michael R. Mosher, Michael Punt, Aparna Sharma

Endnote

< Vita Lona, Ars Longa: Aging, Longevity Extension Technology and the Arts >
By Stephen Wilson

Leonardo Network News

Leonardo Network News
February 2007

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The Newsletter of the International Society for the Arts, Sciences and Technology and of l'Observatoire Leonardo des Arts et Technosciences

CELEBRATING THE FORTIETH ANNIVERSARY of the LEONARDO NETWORK

Leonardo Network News Coordinator: Kathleen Quillian.
E-mail: <kq@leonardo.info>.

< Happy 40th Birthday Leonardo! >

Forty years ago in Paris, a group of artists, scientists and engineers got together and decried the lack of professional venues where emerging work bridging the two cultures could be presented, debated and promoted. Frank Malina, himself a research engineer and a professional artist, convinced publisher Robert Maxwell of Pergamon Press to take on the challenge of publishing a peer-reviewed scholarly art-science-technology journal, the first time such a project had been attempted.

To date we have published the work of 5,538 artists, researchers and scholars. We wish we could bring this community together for a celebration, but in keeping with our networked times, we are collaborating with groups around the world on a variety of events:

Leonardo Celebrates Leonardo da Vinci
Special Section of Leonardo, 2007--2008, edited by David Carrier

What, building upon Leonardo's ways of thinking, can artists and scientists tell each other today? Full call for papers: <leonardo.info> Inquiries and proposals: <david.carrier@cwru.edu>.

Leonardo in New York (February 2007)
Panels, events and exhibition organized by the Leonardo Education Forum at the 2007 College Art Association meeting: <leonardo.info/isast/educators.html>.

MutaMorphosis: Challenging Arts and Sciences (Prague, Czech Republic, 7-10 November 2007): <www.mutamorphosis.org>.

Leonardo co-sponsors a conference and exhibitions in Prague, organized by the International Centre for Art and New Technologies (CIANT): <ciant.cz>.

Lovely Weather in Ireland

We have initiated a three-year collaboration with Regional Cultural Centre Letterkenny, Donegal County, Republic of Ireland, to host a Leonardo 40th Anniversary exhibition and collaborate on an Art and Climate Change Project, "Lovely Weather": <www.donegalculture.com>.

Leonardo in India

The Leonardo/OLATS is working with groups in Bangalore, India, for a symposium and workshop. We welcome contact with Indian artists and scientists who might wish to be involved.

Leonardo in North America (2008)

We are planning a final 40th anniversary symposium and celebration in North America. Further details will be announced on <www.leonardo.info>.

Leonardo in Spain: Expanding the Space (October 2006)

We were pleased to co-sponsor Expanding the Space, a conference and workshop on space

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exploration and the arts: <expandingthespace.net>.

All 40 years of Leonardo Articles Now Available On-Line
Volumes 1-33 available through JSTOR: <jstor.org>.
Volumes 34-39 available through MIT Press: <mitpressjournals.org>.

If you are interested in being involved, or have ideas on how we can celebrate the work of the new Leonardos, send e-mail to rmalina [at] prontomail [dot] com

WHAT YOU CAN DO TODAY

We know what Leonardo da Vinci could have used for his 40th birthday in Milan: a gift membership in the Leonardo organization and subscription to the Leonardo journal. If you know any budding Leonardos, buy them a gift at <leonardo.info/members.html>.

< MutaMorphosis: Challenging Arts and Sciences, International Conference >
8-10 November 2007, Prague, Czech Republic
Conference website: <www.mutamorphosis.org>

MutaMorphosis is an international conference organized by CIANT as part of the ENTER festival in the framework of the Leonardo 40th anniversary celebrations. The festival will also feature the first retrospective exhibition of the work of Leonardo Founding Editor Frank J. Malina.

The conference will explore the major mutations that are affecting the future of our world. Papers will be presented by artists, scientists and researchers on the evolution of life and the societies they constitute, and on the modes of knowledge, expression and communication of humans, animals and other forms of life.

The conference will concentrate on the growing interest within the worlds of the arts, sciences and technologies in extreme and hostile environments. These environments appear as symptomatic indicators of the mutations that are taking place. They are potential vectors for an awareness of the different problems at the origin of the disturbances that threaten the ensemble of the Earth's eco-systems.

Conference Steering Committee: Alban Asselin, Louis Bec, Annick Bureaud, Don Foresta, Denisa Kera, Roger F. Malina (co-chair: rfm [dot] mutamorphosis [at] gmail [dot] com), Louise Poissant, Pavel Sedlák (co-chair: sedlak [at] ciant [dot] cz), Pavel Smetana.

Organizer: CIANT – International Centre for Art and New Technologies in Prague, Czech Republic <www.ciant.cz>.

Co-Organizers: Leonardo, U.S.A. <www.leonardo.info>, France <www.olats.org>; Hexagram, Canada <www.hexagram.org>; Pépinières européenes pour jeunes artistes, France <www.art4eu.net>.

Partners: Centre for Global Studies at Charles University, Czech Republic <cgs.flu.cas.cz>; CYPRES Arts Sciences Technologies Cultures, France <www.cypres-artech.org>; Czech Academy of Sciences – Week of Science and Technology; <www.avcr.cz/tydenvedy>; French Institute in Prague, Czech Republic <www.ifp.cz>; MARCEL, U.K. <www.mmmarcel.org>; UQAM, Canada <www.uqam.ca>.

< Leonardo/OLATS Awards the Leonardo-EMS Prize to criticalartware >

We are pleased to announce that Leonardo/OLATS and the Electroacoustic Music Studies Network have awarded a special prize to criticalartware (Jon Cates, Ben Syverson and Jon Satrom) for their paper "likn: A Flexible Platform for Information and Metadata Exchange," which they presented at the Electroacoustic Music Studies Conference in Beijing, China, October 2006.

criticalartware's project likn is an artware application that addresses the nature of knowledge, ideas and language in the era of globalization. More specifically, likn is a functional online collaborative environment that wages a persistent critique of the

desire to standardize and universalize meaning, and offers an alternative by applying postmodern and postcolonial theories to the challenge of organizing discourse and media. The paper can be accessed online at <www.leonardo.info>.

The Leonardo-EMS jury, consisting of Marc Battier, Kenneth Fields and Ricardo dal Farra, convened on Thursday 26 October after the official closure of the third Electroacoustic Music Studies Conference.

The Electroacoustic Music Studies Network (EMS Network) has been organized to focus on the better understanding of the various manifestations of electroacoustic music. Areas related to the study of electroacoustic music range from the musicological to more interdisciplinary approaches, from studies concerning the impact of technology on musical creativity to the investigation of the ubiquitous nature of electroacoustic sounds today. The choice of the word "network" is of fundamental importance, as one of the goals of the EMS Network is to make relevant initiatives more widely available. More about the Electroacoustic Music Studies Network can be found at <www.ems-network.org>.

Leonardo/OLATS has established a collaboration with the EMS network through which annual Leonardo-EMS Awards for Excellence will be made for the best contributions to the EMS symposium as decided by a joint jury.

< New Intern Carolina Dabbah Ceballos Joins Leonardo >

In early 2007 Carolina Dabbah Ceballos joined Leonardo as an intern to work on the YASMIN project. Carolina is a 24-year-old graphic/web designer. She was born in Jordan and comes from a Greek and Colombian background. She obtained her bachelor's degree in computer science at Al-Ahliyya Amman University in Amman, Jordan. She attained grade 5 status as a piano player from ABRSM (Associated Board of the Royal Schools of Music), U.K. She is also fluent in four languages: Arabic, English, Spanish and French.

Carolina is now working on her masters of fine arts at the University of Texas at Dallas. Her research concentrates on game therapy for post-traumatic stress patients by creating a virtual environment around the 9/11 tragedy in New York City. She is also employed at UTD as a teaching assistant to Thomas Linehan, the director of the Arts and Technology program.

< Special Thanks to Amy Ione for Leadership of Leonardo Education Forum >

Leonardo would like to recognize the outstanding leadership by Amy Ione of Leonardo Education Forum (LEF). Ione was first voted in as a co-chair of LEF in 2005 and in 2006 rotated to the position of Chair, helping to organize all activities surrounding the 2007 College Art Association Conference in New York City. During this time, Ione was also instrumental in initiating relations with the Society for Literature, Science, and the Arts (SLSA). In November 2006, LEF presented "New Media Futures: The Artist as Researcher and Research as Art in the 21st Century" at the 2006 SLSA meeting in New York City. In February 2007, Ione completed her rotation as Chair of LEF and was replaced by incoming Chair Eddie Shanken.

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