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INTRODUCTION

In September's issue of LEA, Sheila Pinkel's editorial questions whether the mandate of *Leonardo* can be expanded to explore the intersection between art, science, technology and society.

We also continue our celebration of the Colloquium on Art/Science/Spirituality Recon-

nections Within Emerging Planetary Cultures and feature the final two sessions of the event.

This month, One From the Vault extracts Eduardo Kac's *Essay Concerning Human Understanding*, which first appeared in LEA in August 1995.

Leonardo Reviews focuses on CDs, websites and exhibitions this month, with Richard Kade's piece on *Encounter: Merce*, a contextualization of the importance of the event staged at Stanford University in March this year. *Talking Drum* and *Rogue Wave* both by Chris Brown are reviewed collectively by René van Peer, one of our active music experts. Finally, Amy Ione, a familiar name to Leonardo Reviews regulars, has written about *Visionary Anatomies*, an event which although now history can be revisited - at least in a restricted way - on the web.

Read about Leonardo Education Forum's new chairs and LMJ's editor extending his contract in Leonardo Network News, and find out more about the place, ground and practice working group in our ongoing series on *The Pacific Rim New Media Summit: A Pre-Symposium to ISEA2006*. Further to this, there is information about an ISEA2006 Pacific Rim Directory, Organizations and Residencies Working Group Meeting to be held in Adelaide, Australia.

In our final section, Bytes, find out more about a call for papers for Leonardo Music Journal's next issue and the availability of a full-time faculty position.

EDITORIAL

EXPANDING THE MANDATE

by Sheila Pinkel
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Since its inception, *Leonardo's* mandate has been to explore the intersection between the arts, sciences and technology. Now there is a 500-pound question on the table: Can the mandate of *Leonardo* be expanded to explore the intersection between art, science, technology and *society*?

In the 19th century, Louis Jacques Mandé Daguerre of France and William Henry Fox Talbot of Great Britain, credited individually with the invention of photography, both happened to take photographs of their respective collections during their initial investigations of photographic processes. Daguerre photographed his fossil collection and Talbot his collection of china. Subsequent commentary has positioned these choices in the context of the intellectual and historical environment of the 19th century, a time of cataloging the physical and biological world as the concepts of the electromagnetic spectrum, the periodic table and phrenology were being developed. Thus, what appeared at the time to be the incidental and objective documentation of collections can be understood, in the context of history, as reflecting the values of the time period.

In Weimar Germany, during the post-World War I 1920s, artists began investigating the physical world from a new frame of reference, which they termed *Neue Sachlichkeit*, or the new objectivity. These artists, including Albert Renger-Patzsch, Karl Blossfeldt and T. Lux Feininger, photographed the world from unconventional vantage points in an attempt to create a new aesthetic, one that they viewed as apolitical and objective. Their subject matter included the technology of the era's growing industrialization, and many of their images of nature also reflect this industrial vision. When juxtaposed against the history of the time - the growth of fascism and decline of labor movements

- these images are understood in a more complex way as reflecting the values of the corporate industrial state.

In the United States, Paul Strand, Edward Weston, Charles Sheeler and other photographers were the counterparts to the German Neue Sachlichkeit artists. From the vantage point of history we can read their images in several ways. For instance, as Sally Stein pointed out in a public lecture when analyzing Paul Strand's image of a white fence, we either can see it as an example of Strand's ability to abstract the physical world, or, if we look at it in the context of the time period, we can consider the point that the growth of industrial capitalism was resulting in the promotion of single-family home-ownership, and fences suggested private ownership of property. So, while the image can be read as neutral, as an abstraction, it also can be read as reflecting the history and values of the time in which it was produced.

Today, can we look at the intersections of art, science and technology and, with the understanding that we have gained from our dialogue with history, begin to comment on and assess these intersections in terms of their sociopolitical, economic and historic implications? Or must we wait for future generations to do this? Given the conditions in the world today, in which most of the world's population lacks adequate food, potable water, health care or educational opportunities, the AIDS epidemic is spreading in Africa and parts of Asia, and the war in Iraq rages on, some contextualization of these explorations is critical in order to render them historically and socially intelligible. The 500-pound question on the table remains: Can the mandate of *Leonardo* be expanded to explore the intersection between art, science, technology and society?

THIS EDITORIAL FIRST APPEARED IN *LEONARDO*, VOL. 38, NO. 4 (AUGUST 2005)

ABSTRACTS

INTRODUCTION TO SESSION 3

This session looked at the role of new technologies (telecommunication, biological, etc.) in our future cultures, and asks how we will appropriate them and what creative use can be made of them.

THE VIRTUAL GEODESY. PROPOSAL FOR A MULTIPLAYER ROLE PLAYING GAME

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KEYWORDS

Role-playing game, scientific data, world culture

ABSTRACT

This project aims at creating new relationships between scientific data and cultural content, as a basis for developing a multiplayer role-playing game.

Players of this game will explore an interactive, 3D, Virtual Geodesy composed of geo-

metric structures organized as habitats for a multitude of data streams expressing the diversity and uniqueness of tangible and intangible world cultural heritage art forms, events and expressions.

Within the new potentials of information technologies, the project will utilize precise data gathered within the scientific domain, as 3D containers for visualization of information. The preciseness, yet vastness, of scientific data for building 3D sites will be well balanced by the symphonic arrangements of world culture content elements into harmonics of spatial locations.

The total Geodesy system will have its own life, as intelligent geometric agents interact within it. They become the game's mind enabling multiple players, with their avatars, to interact, communicate, learn and discover, and for the game itself to evolve over time.

The sites within the Geodesy are the departure and arrival points of the users who will be navigating through tridimensional animated highways of universal interactive cultural content. The system will enable synergetic multiplayer interactions, promoting cooperation over competition, livingry over weaponry.

The project's singularity is the potential to model an ever-evolving intelligent cyber habitat, where every precise site could be as simple as an atom, or as complex as a virtual city.

The strength, coherence, and dynamics of its structural topologies will be the backbone of the Geodesy. By the intelligence embedded in its design and the physics characteristics of its life system, it becomes a playground for infinite crossroads of data streams, taking root in the world culture heritage databases.

BIOGRAPHY

Mohammed Aziz Chafchaoui holds several university degrees in sociology and political science but decided to follow the path of the arts and the pure sciences. He holds a Master's Degree in Arts and Design from Tsukuba University, Japan and has also studied in U.S.A and France. A fundamental issue concerns him: How to approach the worldwide globalization trend while safeguarding cultural specificities.

He strongly believes that in a world where information has taken on a quasi-mythical status, modern means of communication should contribute to the blossoming of Arab Islamic arts. Indeed, most of Chafchaoui's works of art are an attempt to shed new light on the artistic contribution of Islamic civilization (especially in Al Andalus) to universal heritage under the notion of Tawhid or unity between art, science and spirituality. His work spans a wide variety of supports: electronic archival of vestiges of Arab Islamic art on CD-Rom, virtual museum, film documentaries, 3D image Installations.

EGYPTIAN CULTURAL HERITAGE IN THE DIGITAL AGE

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KEYWORDS

cultural heritage, information technology, holistic vision

ABSTRACT

The Center for Documentation of Cultural and Natural Heritage, CULTNAT, was established in January 2000, as a program operating under the auspices of the Ministry of Communications and Information Technology. By presidential decree, CULTNAT became, in February 2003, a centre affiliated with the Bibliotheca Alexandrina, thus asserting its identity and gaining physical status.

This center has, among its targets, the following objectives:

- Documentation of Egyptian cultural heritage in both its tangible and intangible aspects.
- Documentation of the Egyptian natural heritage, which includes the natural reserves as well as the natural areas not yet inscribed under environmental protection.
- Implementation of a national plan to execute this documentation program using the latest information technology in collaboration with national and international specialized organizations.
- Building awareness of this heritage using all available publishing media, electronic and physical.
- Training of professionals in the field of preservation and documentation of cultural and natural heritage.

Our projects so far have included the documentation and digitization of an archeological heritage map of Egypt; the Arabic music heritage; Egyptian natural heritage; the architectural heritage of 19th and 20th century Cairo; and the folkloric and photographic heritage of the Egyptians.

The products of CULTNAT's efforts are books and electronic publications that record Egypt's memory of its tangible and intangible heritage. Our way forward is to achieve maximum accessibility and to enhance pride in our global Egyptian Heritage by providing an easily accessible and reliable chronicle of Egypt's tangible and intangible heritage on the web.

Despite the fact that CULTNAT is a relatively new center, it has already a number of ongoing programs, in addition to a vast network of cooperation with organizations that are concerned with heritage, such as UNESCO, UNDP and the European Union. These programs, which cover many different aspects of the Egyptian cultural and natural heritage, seek to document the tangible and the intangible, i.e. archaeology, architecture, manuscripts, music, folklore, natural resources.

CULTNAT has not only developed action plans to electronically document Egyptian heritage but also contributes to safeguarding fragile treasures of Egyptian history through their digitization. Among these are the manuscripts of the National Archives and the stamps of the National Postage Organization.

While applying new technologies to documentation, massive amounts of data are digitally compiled and sorted, facilitating accessibility to data. CD-ROMs, as well as books, guides and other paper publications, are extracted from this huge database. For greater diffusion, CULTNAT has made information accessible through its website at: <http://www.cultnat.org>. CULTNAT has also developed in collaboration with IBM, a unique website in the field of cultural heritage (<http://http://www.eternalegypt.org/>).

One of the recent achievements of the center is that it has developed a multimedia presentation designed in a 3D-like manner called "Cultural Heritage in the Digital Age: The Egyptian Experience".

Its purpose is to demonstrate how CULTNAT has manipulated ICT to document and promote the many faces and riches of our heritage.

The purpose of this theatre presentation is to illustrate how ICT tools, such as multimedia, GIS, and virtual reality, are innovatively employed in the service of the docu-

mentation of the Egyptian cultural and natural heritage.

CULTNAT's multimedia display includes:

- Running activities and programs of CULTNAT
- 3D Virtual Reality (a visit to the Mastaba of Qar)
- The continuum of civilizations: Scenes from Ancient Egyptian tombs matched with present day images
- The continuum of knowledge
- Mathematics of the Ancient Egyptians and recent mathematics (Rhind Mathematics Papyrus [RMP])
- Astronomy of the Ancient Egyptians and the Arabs and its relationship to today's world knowledge of astronomy

BIOGRAPHY

Dr. Fathi Saleh is currently professor of computer engineering at Cairo University. In the meantime, he is the director of the Center for Documentation of Cultural and Natural Heritage, which is affiliated to the Library of Alexandria with the support of the Ministry of Communications and information Technology.

He is also a member of the Supreme Council of Culture. Between 1995-97 he was the Cultural Councillor at the Embassy of Egypt in Paris, and from 1997-1999, he was the Ambassador of Egypt to the UNESCO.

Dr. Saleh graduated from the Faculty of Engineering of Cairo University and got his Ph.D from the University of Paris in France. His main interest is the application of new technologies in the different fields of Cultural and Natural Heritage.

INTRODUCTION TO SESSION 4

Session 4 tries to make explicit the cultural background of the speakers, and explores how their own cultural and spiritual background has shaped their approach to art and science. This session deals with the broader discussion about art/science but integrates the cultural background of every speaker.

CONTEMPLATIONS ON OUR LINKS TO THE UNIVERSE - SEARCHING AND FINDING THE HIDDEN HARMONY

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KEYWORDS

contemporary physics, harmony, universe

ABSTRACT

I discuss evidences, and consequences of our inseparable link to the entire Universe. The foundations of present day physics are rooted in the theories of relativity and the theory of quantum physics.

Majority of physicists think that there will ultimately be conflict between these two foundations. They see this conflict in the concept of classical causality broken by randomness in quantum physics, and in the concept of classical locality, so essential and basic to relativity, again broken by quantum phenomena.

Perhaps this is a problem with our understanding of quantum causality and quantum locality, and not an indication of a genuine discord between two successful theories. Theories are idealisations of our perception of the physical world and not the physical world itself. In trying to comprehend and explain the 'observables' we construct theories that depend on 'unobservables', hoping that there will be consistency and a full understanding in future. If we ignore the role of these unobservables, we can be misled by our own theoretical constructs.

During the course of my research, and in a determined effort to understand, I have come to realise that the apparent conflict in our theories is not a real conflict of the physical world. Looking deeper one can see the harmony, and inseparability coexistent with locality. There is a tension between inseparability on the one hand and locality and causality on the other, in the language of physics, whereas such a tension is perhaps absent in our philosophical discussions on these concepts.

Our attempt is to reconcile the two opposing notions by going deeper than the level superficially suggested by the mathematical structures of the present theories. The final result of this attempt will be important for the pure physical theory since even apparent incompatibility between two fundamental theories of physics is not a desirable feature for a consistent description of the physical world.

This is also a very important aspect for the individual exploring the physical universe since the worldview that emerges from the exploration always has its roots and interpretation in terms of his cultural, philosophical and linguistic backgrounds where such a strong tension between inseparability of the whole and the local causal flow of events do not seem to exist. The subconscious subjectivity influences and motivates, but does not interfere significantly with the essential objectivity and clarity of the view.

This search for harmony seems to take the explorer to new notions of space and time - material, and causal, and yet inseparable from local. The existence of the whole can be felt in the part, as real, measurable, and undeniable. Despite the apparent randomness, the history and future of motion reveals the whole, and one is able to see glimpses of a design that is vast, and yet comprehensible. Its simplicity and harmony is spiritually enriching, and emotionally moving, and its scale and intimacy makes one feel secure in some strange way.

BIOGRAPHY

Born December 25, 1961, in Kerala, the southern coastal state of India. Schooling and undergraduate studies in Kerala, and M.Sc. in Physics from Indian Institute of Technology, Madras. Ph.D in Physics (1992) from Tata Institute of Fundamental Research (TIFR), Bombay, in the search for a fifth force.

Joined as faculty member in TIFR in 1993. Presently Associate Professor (TIFR), Adjunct Professor, Indian Institute of Astrophysics, Bangalore, and Faculty Associate, Centre for Philosophy and Foundations of Science, Delhi. Was part-time Visiting Professor, Ecole Normale Supérieure, Paris, 2001-2003.

Research interests are precision measurements related to foundational issues in physics using cold atoms and torsion balances, nature of the quantum vacuum, and foundational aspects of gravitation, quantum mechanics and cosmology.

Have also been involved in advanced level physics teaching, especially in undergraduate and graduate level summer schools. Lecturer at the Schools of Cosmology and Gravitation, Ettore Majorana Centre, Erice, 2003-2005. Other interests are films and music. Some expertise in Indian music on bamboo flute and guitar.

Worked with Indian film directors Tapan Sinha as actor (*Wheel Chair* in 1994, language: Bangla)) and with Shaji Karun as assistant director (*Vanaprastham* in 1998 - language: Malayalam)). Also worked (actor) in the Malayalam TV serial, *Legends of Kerala* (1992). Was also a weekly columnist with the Malayalam daily from Bombay, *Kalakaumudi*, from 1999-2001.

FROM THE CONSCIOUSNESS OF LIMITS TO THE LIMITS OF OUR CONSCIOUSNESS

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KEYWORDS

Earth, universe, representations, holography

ABSTRACT

Passing from drawing to holographic installation, Philippe Boissonnet courts light by exploring its penetrating power and destabilization of vision. He sculpts light, reflecting upon its power. The artist focuses on the ambiguity and the attendant complexities inherent in the process of visual perception, clarifying the relativity of viewpoints in a multiplicity of faithful visual representations, often beginning with the terrestrial globe as a model or motif, his research opens to a planetary abundance, and then overflows beyond the traditional "landscape". What illuminates Boissonnet's work-form and/or matter? Light? Earth? The Earth and ourselves?

In fact, his interactive holographic installations are built from a series of intermixtures of drawing, photocopy and photograph- questioning one after the other (one within another) our place on earth, our return to a world essentially trapped by perception.

Adopting the cartographic paradigm within the conception of an "earth body", Boissonnet's artworks integrate our ability to embrace the Earth as a complex living entity interconnected to the image of our self, and to our consciousness.

From *The consciousness of limits: Gaia*, a holographic and interactive sculpture created in 1992, to his most recent project which explores the CBR (Cosmic Background Radiation) *The limits of consciousness; Ouranos*, the artist will present and comment to the audience on his videos and still images of light, digital and holographic artworks, all from 1992 to 2004.

TRANSLATED FROM THE FRENCH BY JULIEN KNEBUSCH

THE SCIENCE BEHIND BACTERIAL ART

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KEYWORDS

structures, patterns, bacteria

ABSTRACT

This picture is one of a series of remarkable patterns that bacteria form when grown in a petri dish. While the colors and shading are artistic additions, the image templates are actual colonies of tens of billions of these microorganisms. The colony structures form as adaptive responses to laboratory-imposed stresses that mimic hostile environments faced in nature. They illustrate the coping strategies that bacteria have learned to employ, strategies that involve cooperation through communication. These selfsame strategies are used by the bacteria in their struggle to defeat our best antibiotics. Thus, if we understand the mechanisms behind the patterns, we can learn how to outsmart the bacteria - for example, by tampering with their communication - in our ongoing battle for our health.

The images come from the laboratory of Professor Eshel Ben-Jacob, of the Tel-Aviv University (<http://www.star.tau.ac.il/~inon/baccyber0.html>) as part of collaboration with Professor Herbert Levine of UCSD's National Science Foundation Frontier Center for Theoretical Biological Physics (<http://www.ctbp.ucsd.edu>). The goal of this research is to unravel the adaptation secrets enabling bacterial survival against all odds. Their efforts build upon progress in two disparate fields - pattern formation in complex dynamical systems and the molecular biology and biophysics of bacteria.

In a sense, the strikingly beautiful organization of the pattern reflects the underlying social intelligence of the bacteria. The once controversial idea that bacteria cooperate to solve challenges has become commonplace, with the discovery of specific channels of communication between the cells and specific mechanisms facilitating the exchange of genetic information. Retrospectively, these capabilities should not have been seen as so surprising, as bacteria set the stage for all life on Earth and indeed invented most of the processes of biology. As we try to stay ahead of the disease-causing varieties of these versatile creatures, we must use our own intelligence to understand them. These images remind us never to underestimate our opponent.

BIOGRAPHY

ESHEL BEN-JACOB is Professor of Physics at Tel Aviv University and the President of the Israel Physical Society. He finished his Ph.D in 1982 on the dynamics of coupled Josephson Junctions and spent 1981-1984 as a Post Doctoral fellow at the KITP in Santa Barbara. He was Assistant Professor at the University of Michigan in Ann Arbor from 1984-1989, and Associate Professor at Tel Aviv from 1987-1992. He is a world-renowned physicist who has made outstanding contributions to the applications of mathematical and physical perspective to the studies of biological systems from bacterial colonies to neuronal networks. He is particularly well known for his new approach to physical biology in which he integrates experimental investigations with generic modeling and new analysis methods. Recently he pioneered the idea of Complexity-Based Adaptability of biological systems such as colonies of microorganisms and cultured neuronal networks. His approach of "Let the Complex be Simple" led to the new functional holography of biocomplexity as well as the development of new measures of regulated complexity. Ben-Jacob is the Maguy-Glass Professor in Physics of Complex Systems and is also well known for his bridging between "Bacterial Art" and the idea of "Shaped to Survive".

NEORA is the designer and producer of several advanced interfaces for museum sites, academic and commercial web sites. She is the creator of *Ayuni* - telepresence in Nablus, *NYSE*- vr 3D interactive simulation of the trading floor, and of *Medea_ex* (<http://www.medeaeex.org>) - immersive/interactive theatre play, which was performed in the Schiller Festival in Manheim, Germany and Acco Theatre Festival 2003, Israel. Since then, she's been experimenting with online worlds for remote learning, and pro-active projected "cave-like installations" for large audiences. Neora teaches cyberculture in Tel-aviv University, and VR in Shenkar College of Engineering and Design.

Neora is involved with the open source movement in Israel, and is the organizer of the

first two hackers conferences in Israel (<http://www.y2hack4.org>). In April 2000, Neora was chosen as one of the 10 most influential people on the Israeli Internet (published in Yediot Aharonot newspaper. The other nine figures were tie/suited distinguished men). She got this title for the insights in her novel, web works, several publications and teachings - all of which were way ahead of her time.

In the last millenium, Neora was a UNIX programmer and PC support team leader in Dec Ltd and CDC Ltd for several years, and co-founder/co-developer in SGH, a startup in 1994, for multi-user games. She's the author of *Digital Affair* (Hakibutz Hameuchad Publishing, 1993), journalist, editor and columnist in a few professional magazines and newspapers over the years.

TECHNOETIC PATHWAYS TO THE SPIRITUAL IN ART

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KEYWORDS

technoetics, nanofield, biophotonics

ABSTRACT

As the new media art paradigm of interactivity unfolds, with telematics and mixed reality systems becoming ubiquitous and commonplace, artists working at the forward edge of speculative research will become increasingly involved in pursuing the nature of consciousness, the complexity of living systems, and the potential of biophysics, nanotechnology, and quantum science for the development of artistic theory and practice.

The substrate for this work is to be found at the convergence of digitally dry and biologically wet systems, constituting what can be called *moistmedia*. At the same time there is increasing interest in the psychic, spiritual and mystical aspects of traditional cultures, and holistic models of being which challenge the West's materialist paradigm. For example, ethnobotany identifies societies across the world that have developed a technology of consciousness from psychoactive plants, while biophysics researches the significance of biophotonic emission from DNA molecules and the information network of light which gives living organisms coherence.

There is a compelling analogy to telematic information networks that permeate the planet as a whole. The emergent field of *technoetics* attempts to address issues of this kind, and to provide perspectives on post-biological culture. This in turn presents ontological and epistemological challenges that call for subtle understandings of mind and spirit.

BIOGRAPHY

Roy Ascott has worked with issues of art, technology and consciousness since the 1960s. Seminal projects include: *La Plissure du Texte*, Electra, Paris 1983; *Planetary Network*, Venice Biennale, 1986; *Aspects of Gaia*, Ars Electronica Linz, 1989. He directs the Planetary Collegium, and is editor of Technoetic Arts. His theoretical work is published in many languages, including, (Japanese) Art & Telematics: Toward the Construction of New Aesthetics. Tokyo: NTT, 1998; (Korean) Technoetic Arts, Yonsei University Press. 2002; and Telematic Embrace: visionary theories of art technology and consciousness, (ed) Edward A Shanken. University of California Press, 2003. *Engineering Nature*

will be published late 2005.

EXPERIENCE OF EXPRESSION: INSTANCES FROM INDIAN DRAMATURGY AND A DISCUSSION ON 'CONSCIOUSNESS'

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KEYWORDS

representation, human body, consciousness

ABSTRACT

Natya, the Indian concept of dance-drama means visual representation (*abhinaya*) in fourfold forms such as using parts of the physical body (*angika*), verbal utterances (*vacika*), costumes and ornaments (*aharya) and physical signs of mental states (*satvika*). The rigorous and specified rules together with an integral approach to emotions, first-person experience of the actor and the spectator make *natya* belong to a higher order of cognition and experience. There is a wholesome representation of human emotions through a complex act of the external body (physical body gestures, costumes, music and plot) and the spiritual body (emotions, states of mind and unique relationship between the one who is presenting the re-representation and the one who is enjoying it).

The fulfillment of *natya* is achieved through the effective and joint performance of different kinds of *abhinaya* and *mudra* (representation of objects, emotions and ideas through single hand and combined hand gestures), the theme of the play, music and involvement of the spectators.

The role of spectators is considered to be an active event that mutually influences the performance of the actor in terms of the representation of feelings. Intersubjectivity is a key concept in the discussion on *natya*.

One of the unique features of *natya* is that the epistemological and the experiential, the theory and technique are coordinated to form a mutually benefiting factor of the whole. Equal importance is given to detailed and specific physical and mental factors involved, and each of their transcendences is specified, at the same time, broadening the scope of experience both for the actor and the spectator.

This presentation will discuss some of these ideas and also some implications of these in understanding 'consciousness'.

BIOGRAPHY

Sangeetha Menon is a philosopher with a doctorate awarded for the thesis entitled "the concept of consciousness in the *Bhagavad Gita*". After graduating in zoology she took her postgraduate degree in philosophy from University of Kerala. A gold-medallist for postgraduate studies, she received a University Grants Commission fellowship for her doctoral studies for five years. She joined National Institute of Advanced Studies in 1996 and is currently a Fellow in the Unit of Culture, Cognition and Consciousness.

Dr Menon has been working in the area of consciousness studies for over 10 years and has given numerous talks, lectures and presentations at various national and international fora. Recently, Journal of Transpersonal Psychology published an article on her research work (2002). She has a book co-authored with H H Swami Bodhananda entitled *Dialogues: Philosopher meets the Seer* (2003, Srshti Publishers) which is a set of nine dialogues on socio-cultural issues of contemporary importance. Her research inter-

ests include Indian ways of thinking in classical philosophical schools, Indian psychology and Indian dramaturgy in the context of current discussions on 'consciousness'.

Dr Menon has edited three books: *Consciousness and Genetics* (NIAS, 2002), *Scientific and Philosophical Studies on Consciousness* (NIAS, 1999), and *Science and Beyond* (NIAS, 2004). She has also authored a few monographs on consciousness in the context of Indian thought and has also published in refereed journals. In 2002, the Indian Council of Philosophical Research garnered her with the "Young Philosopher Award" for her research work. She is also an avid photographer, artist and web designer. She occasionally writes poetry and has an interest in classical Indian dance.

CONCEPTS, BOUNDARIES, AND WAYS OF KNOWING

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KEYWORDS

artificial intelligence, right brain, categories, language, knowing

ABSTRACT

Artificial intelligence has, in terms of its original goals, failed. And its failure can point to some deep and interesting lessons about how we humans see the world-how we function, what kinds of knowledge we pay attention to, and what kind of creatures we are.

In this talk I look at some of the tacit assumptions that underlie not only the research enterprise of artificial intelligence, but science more generally, and even our culture as a whole.

In its quest to create intelligent computers, and robots that replace human beings in many roles, artificial intelligence (AI) has looked primarily at cognition as the essential human faculty. More importantly, even when considering aspects of humanness that are not strictly cognitive, such as emotion and low-level perception, it has unconsciously adopted the stance of the whole of science - to look at its subject from an abstract, conceptual perspective.

But in doing so, so much of what it is to be human is missed that the resulting models and programs and robots fall far short of replicating human nature. It is certainly interesting that computers can now beat human grand masters at chess. But it is also important that there is much in the behavior of a two-year-old child that we cannot explain well enough to allow us to build machines that exhibit similar behavior.

Key to the problem is the sophisticated categories that we have developed to explain the world to ourselves. We use language and facts to analyze and represent the world, labeling objects and relationships, drawing boundaries, and grouping things and people into types and nationalities. In doing so, we come to think that this process is completely natural and obvious, and that this story that we tell ourselves is what the world is really like.

Although this habit has great advantages, and perhaps coincidentally gives us great power of a certain kind, we fail to notice that there is constant projection of what we have created in our minds back onto the world. While we consciously imagine that this world of clear objects and obvious relationships is what the world "out there" consists

of, we actually rely all the time on a deeper, much more intuitive and richly-connected sense of what is there and what is going on. Somehow our conceptual models, including the ones that science provides us with, occupy centre stage in our consciousness, while our non-conceptual intuitive and embodied awareness, which is crucial for much of our survival and participation in the world, stays in the shadows and often escapes conscious notice.

Only as we learn to pay attention to these other aspects of ourselves do we have any chance of seeing the larger picture. In the process we are likely to discover much that we did not know we were missing. We can begin to recover our own wholeness, and at the same time see why AI has experienced such difficulties and why science will tell us only some of the stories we need. We can begin to see how incomplete are the dominant stories of our culture.

BIOGRAPHY

Arnold Smith received his undergraduate degree in applied mathematics at Harvard and did his doctoral research in artificial intelligence (natural language processing) at the University of Sussex. For many years he worked as a research scientist in artificial intelligence, human-computer interaction, and artificial life at the University of Sussex, at SRI International, and at the National Research Council of Canada.

He is currently Associate Director of the Pari Center for New Learning, located in a small village not far from Siena in Italy. He is working these days on the challenges of exploring and articulating much broader and more comprehensive worldviews than the standard one offered by science, that can accommodate insights into the nature of reality from the mystical and shamanic traditions without relinquishing the achievements and open values of the scientific tradition.

INTERSTELLAR ALTRUISM: SCIENCE, ART, AND COMMUNICATION WITH EXTRATERRESTRIAL INTELLIGENCE

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KEYWORDS

interstellar communication, SETI, interstellar messages

ABSTRACT

If some day astronomers detect signals from intelligent life around distant stars, some of the most critical questions facing humankind will be "Should we reply?" and if so, "What should we say?" and "What /could/ we say that would be meaningful to an independently evolved civilization, separated from Earth by vast interstellar distances?" I will suggest that we may be able to communicate something about our science, our artistic sensibilities, and even what it is like to be human.

This paper will examine some of the proposals for interstellar message composition being developed at the SETI Institute in conjunction with the Leonardo network, the International Academy of Astronautics, and the International Association of Semiotic Studies. I will focus on a way of viewing the relationship between art and science that reflects in part my own professional and cultural background as a psychologist from the United States.

A dominant view in American psychology is that human actions can be explained in terms of basic scientific principles. I will review ways that the SETI Institute, in conjunction with an international group of artists, scientists, and other scholars from the humanities, is using this approach to create interstellar messages of the kind that may some day be transmitted by electromagnetic signals to other worlds. In brief, I will suggest that some basic scientific principles that might be shared by many technological civilizations may provide a foundation for describing human notions of aesthetics, human behavior, and even ethical ideals such as altruism.

BIOGRAPHY

Douglas Vakoch is the Director of Interstellar Message Composition at the SETI Institute. As the Deputy Chair of the International Academy of Astronautics Study Group on Interstellar Message Construction, Vakoch had led recent workshops in Croatia, France, Germany, and the United States. He serves on the Editorial Board of **Leonardo**, as well as the Space and the Arts Advisory Committee of the International Society for the Arts, Sciences and Technology. Vakoch is the editor of **Between Worlds: The Art and Science of Interstellar Message Composition**, a book to be published by The MIT Press in Spring 2006. As a member of the International Institute of Space Law, he examines international policy issues related to interstellar communication. In addition to being a clinical psychologist (Ph.D., State University of New York at Stony Brook), Vakoch has formal training in comparative religion (B.A., Carleton College) and the history and philosophy of science (M.A., University of Notre Dame).

POETIC-CUBS

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KEYWORDS

apperception, bioinspired technologies, multisensorial installation

ABSTRACT

Goals of the installation: The use of bio-inspired techniques in the development of POETIC-CUBS [1] responds to offer environments that help the exploration of the mind. Such environments help to feel new perceptions or a higher consciousness.

The development of perception and awareness is the first step in the exploration of

other mental spaces, and in expanding consciousness.

Starting from a bio-inspired electronic tissue, based on the POETIC devices, the main goal will consist in the development of an application where technical/scientific and artistic features are to be demonstrated. POETIC-CUBS will be the outcome of this process.

Ongoing work: POETIC-CUBS will be a physical installation, a sculptural setup, able to self-organise and to adapt its shape driven by the stimuli coming from its direct environment.

The installation consists of nine autonomous robots constructed in the form of cubes with displays in five out of their six sides. The cubes are in a room, so that when the room is empty they are grouped together as a 3 x 3 array, constituting a cell. When a person or a group of people enter the room the cubes start to move and place themselves around the people (holding the same distance between them). Therefore, the cell divides itself and differentiates to create an organism. If the person or the group of people move in the room (or even if one person moves the arms) the cubes move and the colours that are depicted in the displays change. Therefore, in this installation the people can observe how their actions determine the physical aspect of the organism (constituted by the set of 9 cubes), i.e., the phenotype, being thus a clear illustration of the genotype to phenotype mapping process. Learning (epigenetic) mechanisms can also be demonstrated since the reaction of the cubes (i.e., their movement) can be modulated depending on the actions done by people. The cubes also determine autonomously the state of the battery, and upon detecting a low battery threshold they go to a specific place in the room where the battery may be charged.

The POETIC electronic tissue: The use of the POETIC electronic devices in the installation is justified by their capabilities to provide adaptation to the environment and/or the user using evolutionary, learning, growth, self-repair and self-replication techniques. These features permit to produce an optimal response in dynamic environments or in the case this response has to be adapted to the requirements of a user or a group of users.

The POETIC devices are structured around three basic subsystems: the environment subsystem, the organic subsystem and the system interface. The environment subsystem is in charge of managing the interaction of the electronic tissue with its direct environment. It also takes care of the artificial evolutionary processes.

The organic subsystem is constituted by a bi-dimensional array of programmable cells, called molecules. The molecules can locally communicate with their 4 direct neighbours. By grouping molecules it is possible to construct cells with a complex functionality. On top of the molecular level the organic subsystem contains a routing level, permitting the communication between cells. One of the most salient features of the routing level consists in the possibility of establishing dynamic communications in real time between the cells that are implemented in the organic subsystem.

REFERENCE

1. POETIC is the name used for the electronic devices that constitute the hardware substrate of the installation, and CUBS is the word in catalan language equivalent to CUBES in English.

BIOGRAPHY

RAQUEL PARICIO GARCIA, graduate in Fine Arts, and currently a Ph.D candidate at the Technical University of Catalunya (UPC) about Art, Science and Technology: Sensory interfaces and apperception. She has been teaching in different University schools of Barcelona (ESDI, ELISAVA, UB). She has participated in exhibitions held in Mendel Art Gallery Saskatoon, Fundacio Tapies, Media Festival Canarias, Digital Culture Festival, Festival at the Museum of Contemporary Art Chicago, Eliterature Festival, Primavera Sound, Barcelona, Agora Mobius and University of Valencia. Her research interests include body consciousness and expression, and multi-sensory environments and interfaces.

DR. JUAN MANUEL MORENO AROSTEGUI, Ph.D in Telecommunications Engineering, currently holds and Associate Professor position at the Department of Electronic Engineering, Technical University of Catalunya (UPC), in Barcelona, Spain. He is the coordinator of the POETIC 1st project, and in the past he has participated in other projects funded by the EC in the area of programmable devices (RECONF2 and FIPSOC projects) and artificial neural networks models (ELENA project). His research interests include bio-inspired computing techniques, artificial neural networks models and architectures for programmable devices.

CONVERGENCE BETWEEN ART AND SCIENCE. A DIGITAL ARTISTIC CREATION

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KEYWORDS

nature, Chinese thought, artificial life, animations

ABSTRACT

The relations between art and science take roots in the remote origin of civilizations and in their philosophy which models along centuries the attitude of the people about the physical and social phenomena in which they live.

The Chinese thought conceives the universe as a great organization in which the state of each part depends on the others' one. To foresee and act, it is necessary to observe the phenomena of Nature while adapting oneself with flexibility and by respecting their properties so as to preserve a total balance. Impregnated with this belief, my first step towards knowledge and artistic creation is the observation of Nature.

Following the scientists' wake, I probe the world deeply to understand the truth hidden into the messages of Nature. The mechanisms and the operation of the Life penetrated my digital artistic creation through the use of Artificial Life. This enabled me to seize certain processes of the living systems, and at the same time, to create Virtual Creatures endowed with intuitive and evolving moves. *Thanks to new technologies, I do not paint anymore the still life; I program some living nature*.

The creatures that are animated on the computer's screen are virtual, potential and released by my innumerable software writing endeavors. Within this new dimension of the virtual space and time, the actions and the evolutions of this Artificial Life intermingle themselves. Driving all the elementary parts belonging to my creatures constitutes the origin of the intrinsic relations that we can watch into their animations.

Consequently, these animations cannot be satisfied anymore with an interpolation between two positions fixed in advance, but permanently requires an extrapolation upon the future, unceasingly questioned by its own contents. Using behavioral animation, each virtual creature has its own genes and its own form of intelligence enabling it to adapt itself, to anticipate the variations of its environment, and to evolve consequently. Thus, the pictorial shapes are embodied into this Artificial Life. For me, to animate pictures mean to project their life in the future!

On the "Convergence Arts and Sciences" program's basis, the organization "Centre Sciences" of the French National Center for Scientific Research (CNRS) offered me the opportunity to be an artist in residence in a biology research laboratory at the INRA of Tours (France). This enabled me to confront two forms of research, and to associate scientific creation, artistic creation and communication for a large audience.

My film *Ephemere* based on 3D computer graphics animation is not an account or a scientific statement. This artwork exposes a lived track, the results of a contact between

the vision of scientists and the vision of an artist.

Science is always very present in our life and remains faithful to reality, while art always plays with its phantasms, each one according to its direction: Science advances, Art invents.

As in Saint Exupéry's book **Le Petit Prince**, the scientists try to draw a true sheep; the artists are satisfied with its box. The sheep enhances our knowledge; the box contains dreams!

BIOGRAPHY

Born in Taiwan in 1962, Chu-Yin Chen arrived in France in 1987 and received her diploma from the Beaux-Arts school of Paris in 1991. Then, she directed her research towards new technologies, and became Doctor in Aesthetics, Science and Technologies of Arts in 2001. Currently, she is a Professor in Departement Arts et Technologies de l'Image, Université Paris 8.

Strong in her cultural origins, Chu-Yin Chen belongs to a very original current that lies at the crossroad of artistic creation, biology and Artificial Life. Her movies and her interactive installations result from programs based on the theory of complexity and on software technologies enabling to study the process of the living.

BRIDGING CULTURES IN ELECTRONIC COMMUNICATION. NEW MULTILITERACY MODELS FOR INTERACTION DESIGN

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KEYWORDS

interaction design, cultural interface, intercultural grammar

ABSTRACT

Indigenous cultures have a spiritual foundation that is built on social-community interaction and intimate relationships with the physical environment. These interrelationships are defined by aural and visual communication techniques that represent pluralistic perspectives. Research has revealed similarities in the symbols of these early cultures that suggest similar mental models and logical structures across cultures. Psychology research has also indicated that these symbols transcend time and convey similar underlying meanings in contemporary cultures.

With electronic communication it is possible to use digital media to create interactive spaces that simulate the social values and cognitive models of these early oral cultures. There is a great deal of talk about bridging the digital divide by making electronic hardware and software available to underdeveloped communities. Little focus, however, has been given to the need to develop computer interfaces that are appropriate for the diverse learning and communication styles in different cultures. Such interfaces need to reflect pluralistic, aural-visual, community-based communication styles that differ from Western perspectives of temporal sequencing, logical analysis, and fixed hierarchies. Just giving underdeveloped communities traditional computer hardware and software will not bridge the digital divide. The human-computer interface must reflect the user's cultural and social methods of interaction and communication.

In my research I am developing new multiliteracy models for computer interface design.

The interfaces use HyperGlyphs, design concepts derived from dynamic, time-based communication structures used in oral communication in Indigenous cultures. The research uses visual patterns to represent the changing semantic structures in an interactive information space where there are numerous networks of associations. These multiliteracy models integrate the semiotics of early oral cultures with the semiotics of modern electronic communication. The interface designs reflect the pluralistic, aural-visual, community-based communication styles of Indigenous cultures. This research will be incorporated into a collaborative project with two universities in Australia. For this project I am designing the computer interface for an online course in Indigenous studies. The course analyses the cultural interface between Indigenous and Western societies.

Background information about my research is available in two papers at:
<http://www.rpi.edu/~search/HyperGlyphs.pdf>
<http://www.rpi.edu/~search/Transformations.pdf>

BIOGRAPHY

Patricia Search is a multimedia artist and professor at Rensselaer Polytechnic Institute in Troy, NY. She was awarded a Fellowship in Computer Arts from the New York Foundation for the Arts. She is a Fulbright scholar who received a grant to work with two universities in Australia.

Her artwork has been featured in 22 solo exhibitions, over 150 group exhibitions, and several documentaries on electronic art. She received best paper awards for her research in interaction design from the International Visual Literacy Association and the World Conference on Educational Multimedia and Hypermedia. She served on the executive boards of the Inter-Society for Electronic Art and the International Visual Literacy Association.

SPACESUIT: SPACE CRAFT

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KEYWORDS

spacesuits, design, metaphysical objects

ABSTRACT

Often described as a "spacecraft for one", spacesuits exist as highly complex, technical systems. For the wearer of a spacesuit, it represents protection, a life-line extending into the depths of outer space, but for the public, who never see the spacesuit in person, it exists as a symbol embodying dreams and beliefs about who and what we are, and what we may become. It suggests our connections to our larger environment of earth, solar system, and universe.

These concepts are not just projected onto the material spacesuit, but are contained in its physical construction. Designers are themselves individuals with their own notions of what the spacesuit is and what its function should be. These beliefs and philosophies are made material through the spacesuit's design and construction. Once in operation, the physical object projects these philosophies onto the world, literally shaping the reality of the individual inside the spacesuit. The spacesuit is a highly charged, metaphysical object.

This presentation explores the concept of a spacesuit from many points along the spectrum of its existence from art, to engineering, to mathematics. Cultural explorations of the spacesuit, the body, and space have been performed, installed, written about, and documented as part of a masters thesis (MIT, 2003).

These explorations have recontextualized the role of the spacesuit and the entire endeavour of human spaceflight, leading to alternative spacesuit concepts. Refining these concepts required engineering methods including mathematical modelling, model validation, and tests on the human body. In the end, a vision of a culturally invested Mechanical Counterpressure spacesuit is developed along with some of the design tools necessary for its realization. In this way, the spacesuit serves as an object of inquiry fostering thought about the connections between the internal and external universe.

It is from this holistic exploration that new (or recontextualized) spiritualities emerge, moulding the foundation for future work. By approaching even the most technically demanding, life-threatening situations in this way, we enter into "space craft," an artistic mode of investigation and realization capable of producing artefacts for the cultural advancement of humanity. Due to the embodied beliefs and philosophies, these artefacts facilitate new possibilities for the people around (and in) them.

Biographical note: <http://www.space-craft.info>

SELF-REFLEXIVITY IN SCIENCE AND ARTS

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KEYWORDS

self-reflexivity, digital technologies, arts

ABSTRACT

To "observe" something scientifically usually means to observe something that exists "outside", independently of human conceptions. Scientists tend to ignore the world "inside" - their conceptions, projections and presuppositions.

Instead of overlooking already acquired concepts a self-reflexive mirror will be developed in order to observe how concepts are build up in the first place. This mirror will not merely reflect visible light, however. It does not even require our eyes but rather forces us to close them.

A self-reflexive mirror requires to look "inside" and to observe how our mind-reflections i.e., our rule-guided thoughts, our sound- as well as taste-, smell- and touch-sensations arise and vanish. Digital technologies in combination with arts serve as a tool in order to virtually (re)construct a self-reflexive mirror of non-dualistic mindfulness/awareness.

Once we are able to observe in a self-reflexive fashion how our concepts evolve, we may realize that the distinction between our concepts and our meaningfully formed reality is a concept in itself. A self-reflexive mirror may provide arguments for the view that subjects as well as objects arise hand in hand with linguistic concepts and rule-guided reciprocal actions, just as virtual realities require code as well as interaction with a user for their existence.

BIOGRAPHY

Dr. Andrea Gaugusch was born in 1977 and received her M.A. in Psychology (specializing in Music Psychology) in 2001, and her Ph.D. in Philosophy in 2003, from the University

of Vienna, Austria.

She was the recipient of the "Schrödinger Scholarship" on the project "Non-Dualism and its Implications for Cognitive Science". She is currently pursuing Postdoctoral Research at Indiana University, Bloomington (U.S.A.), and is a postdoctoral fellow of the "Planetary Collegium" (CAiiA-STAR), University of Plymouth.

LESSONS FROM THE PHILIPPINE TRIAD

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KEYWORDS

Philippine society, tripartite structure, art-science

ABSTRACT

In my practice as artist and educator of art motivated by technologies, I have found a place in a mythical way of thinking in and about technology. Eventually, this led me to a vivisection of binary oppositions that seemed always to make difficult the intersections between science and art.

I found a powerful tool of vivisection in the tripartite structure of ancient Philippine society: the Datu, Blacksmith and Babaylan. The role of the Babaylan in this triad, which contemporary society has nearly completely bombed and "educated" into oblivion, is most crucial. In the binarism of the Datu and Blacksmith, it is the Babaylan who strikes the balance.

Being a completely integrated individual, the Babaylan is traditionally endowed with the power to thread the physical, social, spiritual and psychological ties of a community in thinking, and eventually extricating, its people out of the oppressive relationship with a dangerously bi-polar world.

In a culture where art has ritual value, recovering the Philippine triad is to recover art as a living ritual. It is a process of defining in cultural terms a deeply rooted meaning of both art and technology. This presentation is a visual/aural journey, through art, science and technology, to the recovery of the Philippine triad, and the difficult but crucial remembrance and practice of the ritual and philosophy of the Babaylan.

BIOGRAPHY

Fatima Lasay is an artist, educator and independent curator of digital media art. She obtained her degree in Industrial Design (1991) and Master of Fine Arts (2002) at the University of the Philippines, College of Fine Arts.

In 1995, she was invited to develop and implement digital media courses for the studio arts department at the College. She is currently Assistant Professor of digital media at the University of the Philippines. Her artistic and research concerns include the

intersection of technology-based art with Asian mythologies, Spanish colonial religious art, electronic literature and sound.

AN ANOTHER READING OF THE GREEK MYTH OF ORPHEO WITH THROUGH NEW TECHNOLOGIES: POETIC PROPOSITION ABOUT ARTIFICIAL LIFE

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<http://www.pixelcreation.fr/news/news.asp?code=1724947516>

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<http://www.zazieweb.fr/archives/2001/imprimer.php?num=16225>

KEYWORDS

computer music, virtual orphism theatre, interactive drama

ABSTRACT

This multimedia play rests on poetic and musical variations with settings, singers, real and virtual instrumentalists. This scenic device proposes an interpretation of the myth of Orpheo, around a reflection on the problems of the border between the life and virtuality, namely that we explore the oddness of this impression of reality produced by data-processing simulations, this sensory perception comparable with that which would create the entities, the processes or the environments real or imaginary which are simulated. This proposition of representation of one part of the story of Greek cosmology with through a virtual environment is held within interactive dramaturgy.

The story begins with the moment where Orpheo goes down to the hells to try to save Eurydice and meets Cerbere, the dog with multiple heads, which keeps the door of the kingdom of the God Hades. This character is represented by a network of inter-connected computers whose each screen posts an animated head with a personality, and a speech decorated with declamation of onomatopoeical sentences, which have him clean and with almost human appearance.

The plurality of these various natures constituting the character of Cerbere authorizes a kind of "interior" dialogue. This scenic principle is used here like a poetic metaphor of the principles of emergence and artificial life. Orphism and virtuality: Ian-nis Xenakis, was the first on who propose bringings together between the virtual one and the music. The exercise of formalization which constitutes the musical transcription thought of a thought formalized for data-processing application brought closer from its point of view of work of the Old Greeks. "When only states that spirit is deposed God, ekstasis, (left oneself), can reveal its true nature.

It is necessary to escape the wheel from the Birth by purifications (Karthamoi) and sacraments (orghia), instruments of the ekstasis. The katharmoi are done by the music and medicine". One can foresee, here, a direct reference to orphism. This exit of self-orphic symbolizes for him the control of humans on nature, this universal gift of creation. It represents the field of possible which works with the raising of age of computer. It is the reason of the musical revival.

We propose here a second reading of this myth in comparison with new technologies in order to give in debate an old question about the notion of the "alive" one. The myth of Orpheo poses the problems of existence of border between living and the "nonalive" one, enters animated and inanimated. In another words, it raises the following question can one know qualities prone alive compared to an object which is not, between what is natural and artificial. Or in other words to take again the problems of Jacques Monod:

"Would it be in fact possible to define by objective criteria and Generals the characteristics of the artificial objects, produced conscious projective activity, in opposition to natural objects, resulting from the free play of the physical forces?".

Without however answering these questions we present a metaphorical interpretation on this set of themes. The character of Cerbère is the central character of the part, which will support in a brief way of these theses. It incarnates to some extent, problems. It represents at the same time the world of the gods, which in imaginary of orphic is symbolized by the paramount seed, being defined as an entity integrating a plurality of qualities.

By opposition, human is just an individualization of these qualities; it is a degradation of this initial entity. Cerbère constitutes here a whole of different personalities gathered in networks of computers each unit with a clean behavior, however it is released from the device of the emergent properties of the system making it possible to put in his work a unit within the network. This property constitutes here, a metaphor and represents that of the feeling and more precisely that of the feeling in love. It is thus, because Cerbère is in love of Eurydice that this one will remain into the shadow. It thus achieves to solidify Eurydice in this space out of the lifetime, achieving a certain way him also phonographs (act which deprives of the life a being). Do the problems presented by the personification of the networks of computers by the character of cerbère raise the question to know if an entity has gifted of action and of feeling which evolves in time, perhaps qualified the alive one?

This part carried out in collaboration with the team of INREV directed by Monique Nahas and of CICEP directed by Philippe Tancelin of the University Paris 8 was presented at the European House Photography in Paris, at the time of the festival @rt outsiders organized by Jean Luc Soret.

BIOGRAPHY

A doctor in aesthetic, science and technology of Arts, Kiss is also a professor-assistant in computer music in the University of Marne La vallee and a researcher in the CNRS Aesthetic Institute of Contemporary Arts. She explores through various media the potentialities of the connexionist filters within interactive systems dedicated to numerical arts. In her publication *Musical Composition and Cognitive Sciences* she reports these process.

BONUS SECTION

REFLECTIONS FROM THE INTERNATIONAL FESTIVAL OF CULTURES IN MELILLA

by Judy Kupferman
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The city of Melilla recently held its first International Festival of Cultures. This included a colloquium on Science and Art, which took place in Melilla on July 18-20, as well as an art exposition, and nightly concerts on the beach. It was sponsored by the City of Melilla together with Leonardo and the Al Andalus Foundation. Melilla is a surprising town. It is located on the north coast of Morocco but has belonged to Spain since 1497. It features the most spectacular display of modernist architecture outside Barcelona, along with an ancient fortress and a lovely seafront. Perhaps its main distinction is the fact that many cultures live there in harmony: Moslems, Jews, Christians, Hindu and Gypsies walk through its streets with no apparent tension. The conference reflected this diversity and was, therefore, unusual. In addition to the colloquium the festival featured an exposition of art and concerts on the beach, representing the various local cultures.

The subject of the colloquium was science, art and Mediterranean culture. Participants varied accordingly; rarely have I seen such a variegated set of people, and the remarkable experience of the conference was in getting to know people from areas both geographic and professional with whom I would never otherwise have come into contact. In addition, we were from very different cultural and religious backgrounds, and thus meeting on neutral ground provided a rare opportunity to begin to understand the different cultures and world-pictures. After all, the main theme behind the varied subject matter was the world-picture, how we grasp the universe and our place in it, be it as scientists, artists, people of various faiths and disciplines.

The moving spirits behind the conference were Mohammed Aziz Chafchaoui of Morocco; Roger Malina of Marseille, astrophysicist and editor of Leonardo; and Julien Knebusch of Leonardo/OLATS in Paris. Participants at the conference included scientists, artists, and scholars from India, France, Spain, the UK and the US, Jordan and Egypt. Our Israeli contingent was large as it was thought this would help in bridging between the cultures. It included Prof. Eshel Ben Jacob, physicist and President of the Israel Physical Society; Yael Katzir, former student who now works with bacterial art; Neora, digital artist; and I, a theatre lighting designer and physics student who have one foot in each world, so to speak.

We did not know quite what to expect when we were invited, and were impressed and surprised by the experience. For us, as for many of the others, it was a rare opportunity to meet people from very different cultures and viewpoints. This situation involved a certain amount of strain at times and was not always an easy experience. However, the festival activities smoothed out this strain in many ways. Strolling together through the art exposition and listening together under the stars to a thrilling flamenco performance - all these helped in bridging barriers that were not at all trivial. The warm and special atmosphere of the city contributed a great deal. Melilla is a relaxed place. Drivers don't honk their horns. Women in full Moslem dress stroll side by side with girls in strapless tops, and nobody seems disturbed by this sight. People smile easily and are friendly to strangers.

The conference included four sessions: The first dealt with the relationship between art and science, and the second with the role of computer software in future culture. The third focused on Islam, and on art and science within the Arabian-Spanish world. The fourth centered around the influence of cultural background on approaches to art and science. A few examples of the lectures may offer some idea of the content. This brief survey necessarily omits other interesting presentations, but I have tried to give some idea of the variety offered.

Roger Malina's lecture dealt with the tension between the different cultures of art and science as well as those of engineering and technology, of different views and religions, and of regionalism. Other lecturers embraced technology as embodied by the internet: Mohammed Aziz Chafchaoui together with American Harold Brokaw described their "Virtual Geodesy", an interactive computer program which attempts to create relationships between scientific data and cultural content. Karla Schuch-Brunet of Brazil gave a survey of the use of the Internet as a vehicle for social reform in Brazil. Dr. Fathi Saleh of Egypt described the website he has set up of Egyptian heritage (<http://www.cultnat.org>).

Some lectures focused on arts and literature. Leila Khalifa of France spoke of the concepts of time and space in the work of Ibn 'Arabi. Neora (neora.com) of Israel described her experimental theater production of "Medea_Ex." This piece used a virtual 3D mythological universe projected around the audience, and the audience, represented as the chorus, influenced the action using SMS messages. Dr. Sangeetha Menon of India spoke of consciousness research in light of Indian dance drama.

Dr. Ahmed Moustafa, renowned Islamic researcher and artist, discussed the geometric form of Arabic script and its implicit significance. Dr. Moustafa's talk focused on the square shaped dot and its relationship with the shapes of letters. In accordance with the system of Arabic script devised by Abbasid Wazir Ibn Mugla in the 9th century, this reflects images of Islamic mystical thought. Dr. Moustafa also spoke of the cube, and, indeed, his own artwork, a multicolored structure of cubes on cubes, was on view

in the exposition. Professor Eshel Ben Jacob's lecture involved a link between science and art. He described self-organization among bacteria, as evidenced by the beautiful artistic patterns they produce. This lecture had unexpected drama: The computer that was to project the Power Point presentation would not function, and Professor Ben Jacob finally decided not to wait for its repair, placed one slide that he had prepared in an overhead projector and improvised a beautifully clear presentation around the single slide, which may even have proved more effective than his original carefully prepared lecture.

An interesting insight into the relationship of art and culture was provided on the last day. In the morning Indian physicist C.S. Unnikrishnan gave a talk which basically dealt with general relativity in terms accessible to the layman.. Professor Unnikrishnan's current work involves measurements of the Casimir effect. He prefaced his lecture with talk about his own background and the personal spiritual motivation behind his scientific career. I contrasted this with two lectures later in the day, which were given by western artists. Philippe Boissonnet of Montreal described his work with holograms in technical detail. (The lecture and pictures were interesting but it would have been nice to see the holograms themselves!) Roy Ascott, a British artist with an impressive record of academic positions who has spent years of work on digital art, spoke of the new vistas opening up to the artist inspired by biophysics and biophotonics. This talk too had a distinct analytic and technical flavor.

In the two days preceding the event, there had been several comments about the opposition or dichotomy of art and science. These three lectures seemed to contradict that. I doubt very strongly whether Western scientists would have prefaced a description of their work with talk about their personal spiritual motivations, and yet clearly there is strong personal motivation behind any such work; otherwise one wouldn't engage in something so difficult! Similarly the Western background of the two artists probably contributed to the clearly articulated conceptual framework and methodology they described; yet surely few artists of any culture create without a conceptual framework and methodology. One could see that, in fact, art and science are not inherently different activities but that the cultural background of the speaker influences the way he describes his work to others.

Many of the participants seemed to find new food for thought in the meeting with people of such different backgrounds and fields. Artists don't usually attend conferences together with scientists; Moslems don't often talk about the Qur'an with Jews. There was much private discussion of the various issues.

I asked my Israeli companions their impressions of the conference and the festival. All agreed that a major part of the experience was the variety of people and ideas we met. This multiplicity of cultures and religions were reflected in the city of Melilla itself with its multicultural harmony, and lent significance to the choice of this particular venue for the conference. Eshel Ben Jacob pointed out that in most scientific conferences the audience outnumbers significantly the lecturers: Each session includes a few presentations before the public, followed by questions. In this case the participants of the conference were themselves the audience, and often were not of the same field as the lecturer. This situation provided an opportunity for widening horizons and for more immediate discussion than is usual in more formal public situations. It was thus possible to create a much stronger relationship between the various participants. In addition, the formal structure of the conference included much time together aside from the lecture sessions. The informal discussions at the two-hour mealtimes customary in that country provided a rare chance to get to know each other.

The material presented at the conference was interesting and valuable, enabling a profound examination of values, of the relationship of art and science, and of man's place in the universe. But perhaps the most valuable and unusual aspect for all the participants, I think, was the opportunity to form relationships of friendship and respect with people from significantly different backgrounds and thus gain some insight into extremely different visions of our world. It must be stressed that this is just the beginning: This first Melilla conference has shown that such a meeting of different and even conflicting elements can succeed, and it seems of first importance to continue such events on an annual basis.

BIOGRAPHY

Judy Kupferman is a leading Israeli lighting designer. She has worked in hundreds of productions in theater, dance, opera, son-et-lumiere, exhibitions, outdoor spectaculars and more. She is on the faculty of the Theater Department at Tel Aviv University. Years of working with light led to insupportable curiosity about physics, and eventually to a BSc in physics at Tel Aviv University. She is now working towards an MSc, and trying to juggle this along with a lighting career and teaching. Though this is not easy she generally finds it to be a lot of fun.

ONE FROM THE VAULT: FROM THE LEA ARCHIVES

ESSAY CONCERNING HUMAN UNDERSTANDING

First published: (LEA 3:8), August 1995

http://mitpress2.mit.edu/e-journals/LEA/TEXT/Vol_2/lea_v3_n08.txt

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The title of this article refers not to Locke's philosophical work, but to the live, bi-directional, interactive, telematic, inter-species sonic installation I created with Ikuo Nakamura between Lexington (KY), and New York. This piece was presented publicly from October 21 to November 11, 1994, simultaneously at the Center for Contemporary Art, University of Kentucky, and the Science Hall, in New York. The installation is scheduled to be presented publicly again at the Susquehanna Art Museum in Harrisburg, Pennsylvania, in September of 1995.

Ikuo, a New York-based Japanese artist and holographer, and I met very briefly in 1990, during the opening of my solo exhibition at the Museum of Holography, in New York. A common friend re-introduced us again online via e-mail in 1993, and since then we started to develop a very stimulating dialogue, primarily over e-mail.

Ikuo and I discovered many interesting points in common. The most striking coincidence was that we were working independently on similar concepts for an interactive installation. He once described a piece in which two cactuses would exchange signals live over a modem connection. I told him about a piece I was working on in which two caged birds would have a live telephonic conversation. After we met again personally in 1994, during the Fifth International Symposium on Display Holography at Lake Forest College, Illinois, we decided to merge the two concepts and create a piece in which my canary dialogues over a regular phone line with his plant 2,000 miles away.

Instead of the cactus, the plant of choice was the Philodendron. The piece was exhibited in the context of my show Dialogues, realized partially on the Internet, in connections with other museums and galleries, and in the Center for Contemporary Art at the University of Kentucky.

[THIS TEXT CAN BE VIEWED IN ITS ENTIRETY BY LEA/LEONARDO SUBSCRIBERS AT: <http://mitpress2.mit.edu/e-journals/LEA/archive.html>]

LEONARDO REVIEWS

2005.9

This month we are featuring three reviews chosen as much for their quality as diversity. Although the majority of our work at Leonardo Reviews deals with books and sometimes journals we do have a number of very active reviewers who focus their attention of CDs, websites and exhibitions.

This is precisely the selection this month as we start with Richard Kade's review of *Encounter: Merce* is not so much a critique as a contextualization of the importance of the event staged at Stanford University in March this year. *Talking Drum* and *Rogue Wave* both by Chris Brown are reviewed collectively by René van Peer, one of our active music experts. In a long review van Peer provides both background information and an informed and reasoned account, which, in itself, reads as though it is music.

Finally Amy Ione, a familiar name to those who follow Leonardo Reviews, has written about the overview of an event which although now history can be revisited - at least in a restricted way - on the web. Her review of *Visionary Anatomies* at the National Academy of Sciences, Washington DC, 2004 also includes the url at which it is archived. As usual she has identified one of the important discussion currently going on our field and triangulates *Visionary Anatomies* in a wider fascination with the boundary between art and science.

Among other reviews posted this month there is Yvonne Spielmann's review of the Venice Biennale. This is an event that she now covers regularly for us and as you will read, she feels raises some rather profound problems.

All these reviews together with the archive can be found at <http://www.leonardoreviews.mit.edu>

Michael Punt
Editor-in-Chief
Leonardo Reviews

REVIEWS POSTED AUGUST 2005

Appropriating Technology: Vernacular Science and Social Power
by Ron Eglash, Jennifer Croissant, Giovanna Di Chiro, and Rayvon Fouché, Eds.
Reviewed by Stefaan Van Ryssen

Artificial Life IX: Proceedings of the Ninth International Conference on the Simulation and Synthesis of Living Systems
by Jordan Pollack, Mark Bedau, Phil Husbands, Takashi Ikegami and Richard A. Watson, Eds.
Reviewed by Stefaan Van Ryssen

La Biennale di Venezia
51st International Art Exhibition
Reviewed by Yvonne Spielmann

Carnal Art: Orlan's Refacing
by C. Jill O' Bryan
Reviewed by Rob Harle (Australia)

The Curvature of Spacetime: Newton, Einstein, and Gravitation
by Harald Fritzsch; translated by Karin Heusch
Reviewed by Stefaan Van Ryssen

Disruptive Pattern Material: An Encyclopedia of Camouflage
by Hardy Blechman
Reviewed by Stefaan Van Ryssen

Encounter: Merce

Event website: <http://encountermerce.stanford.edu>.
Reviewed by Richard Kade

Hans Haacke
by Walter Grasskamp
Reviewed by Artur Golczewski

Infinite Variety: The Life and Legend of the Marchesa Casati
by Scot D. Ryerson and Michael Orlando Yaccarino
Reviewed by Stefaan Van Ryssen

Leonora Carrington: Surrealism, Alchemy and Art
by Susan L. Aberth
Reviewed by Roy R. Behrens

Proteus: A Nineteenth Century Vision
by David Lebrun
Reviewed by Roy R. Behrens

Qatar Foundation
Innovations in Education: the Art and Science Partnership
Reviewed by Michael R. (Mike) Mosher

Shades of Black: Assembling Black Art in 1980s Britain
by David A. Bailey, Ian Baucom & Sonia Boyce, Eds.
Reviewed by Michael R. (Mike) Mosher

Symmetry 2000: Part 1 and Part 2
I. Hargittai & T.C. Laurent, Eds.
Reviewed by Rob Harle (Australia)

Talking Drum
by Chris Brown
and
Rogue Wave
by Chris Brown
Reviewed by René van Peer

Technology as Experience
by John McCarthy and Peter Wright
Reviewed by John Knight

Them: A Memoir of Parents
by Francine du Plessix Gray
Reviewed by Roy R. Behrens

Visionary Anatomies
by Harvey Fineberg, J.D. Talesk, and Michael Sappol
Reviewed by Amy Ione

ENCOUNTER: MERCÉ

Stanford's interdisciplinary exploration through the arts, focusing on the life and art of Merce Cunningham, legendary choreographer, dance innovator, and artistic thinker
Event website: <http://encountermerce.stanford.edu>.

Reviewed by Richard Kade
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Most of March 2005 at Stanford University was billed as "Merce Immersion," replete with the premiere performance of the newest ballet written especially for the occasion by the noted choreographer, Merce Cunningham. The celebration culminated in an unlikely collaboration between members of the school's dance, computer sciences, and medical departments in an outlandish attempt at disambiguating the so-called "vocabulary of 'traditional' ballet" as in contradistinction to that developed by Cunningham and his company over the course of the past quarter- to half-century.

In much the same way Stravinsky could be said to be the "Picasso of music" (or, similarly, C. S. Forester observed Puccini to be the "Wagner of opera"), one could postulate plausibly that Cunningham has long been the "John Cage of dance" - were it not for the fact that these two had actually performed simultaneously on the same stages, in the same numbers, for a number of years.

Use, twice, of the word "same" in the previous sentence might be misleading in the larger sense as one easily might conclude erroneously that some collaborative effort was under way. Yes, Cage and Cunningham often traversed the nation together in a beat-up VW van but, once on stage, any idea of planning a coherent work - where two art forms (music and ballet) were fused to convey any notion of a united aesthetic effort - seemed an abhorrent violation of spontaneity.

In fact, at the height of their performances together, the concept of freeform knew no limits. Cunningham decided that, in addition to Cage and himself, the lighting crew ought also to partake in the free-for-all. The most memorable, if not noteworthy, result of this stroke of "genius" was that, at a key point where Merce was at the apogee of one of his leaps, a bright spotlight temporarily blinded him causing his fall into the pit. Alas, this did not deter him from continuing his choreographic pursuits that persist to this day.

While ample instances of the work of Merce Cunningham (old notes and the like) abound on this and other of the Stanford pages referenced on this site, the bottom line is simple. That which we humans regard as "classic" - be it music, sculpture, poetry, gastronomy, painting, origami, folding photons, etc - is what we continue to return to because it ignites a spark within our soul. Such creativity is almost never a matter of happenstance. Even the most talented artists in the realm of jazz improvisation work within the context of an understood framework.

To see how firmly rooted in vacuity the creations of Merce Cunningham are, and always have been, one need look no further than the works of Mark Morris (*Falling Down Stairs* or *Hard Nut*) or Michael Smuin (*Starshadows* or *Stabat Mater*). Unplug the virtual-reality sensors and forget the pretentious and nonsensical nano-analyses of every component of the work. As Yogi Berra so aptly put it, "You can see a lot by observing!"

TALKING DRUM

by Chris Brown
Pogus Productions, New York, 2005
CD, P21034-2, \$14.00
Distributor's website: <http://www.pogus.com/>.

ROGUE WAVE

by Chris Brown
Tzadik, New York, 2005
CD, TZ 8014, \$14.00
Distributor's website: <http://www.tzadik.com/>

Reviewed by René van Peer
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Chris Brown, pianist, computer music composer and co-director of the Center for Contemporary Music at Mills College in Oakland, California, showed a special attention for rhythm and percussion in earlier works of his, such as **Lava** (released on the Tzadik label in 1995) and a series of collaborations that he compiled on the 1996 **Duets** album on Artifact Recordings. While he was completing the latter, he started developing an interactive spatial setup for linking drum machines with live percussion, which he called Talking Drum. He published a detailed technical description of this installation work in **Leonardo Music Journal** Vol. 9 (1999). On an album with the same title, Brown recently released recordings of a number of these installations, interspersed with location recordings he made in Bali, Cuba, Turkey and the Philippines.

It is exactly the juxtaposition between the different types of situations that makes **Talking Drum** a wonderful listening experience. What all recordings share is a strong sense of informality and spatiality. On the other hand, there is a marked difference between the intentional character of improvisation in the installation recordings and the looser interaction in the other takes. The interplay of the musicians (percussionists as well as players of other instruments) with the computer driven percussion does sound intriguing, initially almost like a ball being hit back and forth in a game of tennis until players and machines start to interlock, or move apart into separate patterns that drift through each other but don't audibly get together into a superstructure. What is very clear to the ear (especially when listening through a headset) is how the sounds are distributed over the space and move through it. Still, these pieces somehow tend to sound restrained and forced, as if the musicians always need to be prepared for the unexpected, to pit their wits against the imperturbability of the systems they are facing.

The location recordings are quite different in that respect. Several of these were made during dances and ceremonies, in which percussion plays a major role. The Cuban and Balinese tracks just bristle with musicians going at it full tilt, dancers and standers-by charging the atmosphere with their response. Here, too, the spatial quality of the recordings draws you into the action. Actually not all these environmental recordings are percussive. You can hear people milling about on a market, traffic in the background, sometimes passing by at close range. There are takes of frogs and birds. But because of being interspersed with the ostensibly percussive pieces, their rhythmical aspects are brought to the fore. One of the most enchanting recordings was done in the Hagia Sophia mosque, where you can hear the measured hammering of carpenters, amplified by the grand domed hall and shrouded in the thick veils of its reverb.

What makes this album outstanding is how Brown has achieved in weaving these very different recordings together. He has created transitions that are remarkably smooth and logical, making one grow out of the other, often by using some rhythm pattern or timbre that they share, as a bridge. Thus this entire CD is a complex of interplay between all these various strands. Despite the contrastive quality of the various components Brown makes it work as one large-scale composition.

The four recent and two older pieces on **Rogue Wave** show that characteristics apparent in **Talking Drum** are interests Brown has pursued throughout the years - the interaction between electronic systems and live musicians, the distribution of sounds around a space as part of his compositions and recordings, and his predilection for rhythm as a major driving force for his music. **Rogue Wave** does, however, present a far broader sampling of Chris Brown's multifaceted work. It includes computer network music, which he pioneered with his colleagues of The Hub; his piano playing; his work with self-built and adapted instruments; collaborations with other musicians and composers, such as the virtuoso percussionist William Winant who is featured on three of the tracks; and even a piece of symphonic instrumentation, scaled down by necessity, but impressive nonetheless. Called **Alternating Currents**, it was commissioned by Kent Nagano for the Berkeley Symphony Orchestra in 1983. This piece seems to foreshadow *Lava* being likewise scored for percussion, brass and live electronics. Written over twenty years ago it already shows Brown's use of complex and irregular rhythms (which may expand and contract) as central to his compositional work.

Even more spectacular is the most recent piece, after which the CD was called. The

dense buzz of a bull-roarer serves as a ground layer on which Brown, Winant and turntable player DJ Eddie Def throw percussive sounds from the various sources in their respective domains - electronic, acoustic and vinyl. The intensity of the patterns mounts and subsides. Trying to follow in detail what is going on you stand a serious chance of getting swept off your feet by the powerful density of the texture, which does indeed feel as if a wave of sound is crashing into you.

Brown himself performs in all the pieces on the *Rogue Wave* album, mostly doing live electronics. Apart from the *Rogue Wave* piece he is most perceptibly present in *Transmission Tenderloin* and *Retroscan*. The former was taken from a live broadcast, which is part of an ongoing series of collaborations between Brown and Guillermo Galindo, in which their electronic music improvisations are broadcast over different frequencies, to be picked up by people in an outdoor audience on receivers they bring with them. This turns the environment into one large performance space full of moving sound.

On *Retroscan* Brown plays the piano that is in its entirety a source of the sounds generated and then transformed by an interactive computer program. The music bounces back and forth between the playing and the modifications - the program responding to the input of sound, and Brown responding to what comes out of the system. On the one hand there is a continuous dialog that resembles a conversation, in which new views are introduced into the thoughts that develop. On the other hand, the electronic sounds become a layer separating itself from the acoustic sounds, turning into a changeable blanket of drones and riffs on which Brown drops single tones, snatches of melody and resonant bangs and taps on the frame.

These two CDs complement each other beautifully, one focusing on this interactive electronic installation that Brown developed, which is presented as a large composition; the other compiling different aspects of his work. Together they are a showcase of his versatility as a composer and player of electronic music, and of his capability to set up musical dialogs through intelligently and sensitively designed electronic systems.

VISIONARY ANATOMIES

by Harvey Fineberg, J.D.Talesk, and Michael Sappol
National Academy of Sciences, Washington DC, 2004
40 pp., illus. \$N/C

Exhibition website: http://www7.nationalacademies.org/arts/Visionary_Anatomies.html

Reviewed by Amy Ione
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One of the best-kept secrets in Washington D.C. is the National Academy of Sciences gallery space, where exhibitions that explore relationships among the arts and sciences, engineering, and medicine are regularly mounted. Given my enthusiasm for this venue, I was excited to learn a small catalogue accompanied their recent exhibition *Visionary Anatomies*.

Excellent, and yet concise, this 40-page overview is a treasure. It includes full color reproductions of each artist (or collaborative team), brief statements about the printed works, and introductory essays that place current fashions within the history of art and anatomy. As a whole, the book brings to mind several recent exhibitions (*Dream Anatomy* at the National Library of Medicine, 2002', *The Hayward Gallery, London's Spectacular Bodies, 2000-2001*: and *Revealing Bodies* at the San Francisco Exploratorium, 2000). These exhibitions similarly highlighted how artists have translated the collective advancements in medicine, anatomy and technology into their own projects.

Indeed, J. D. Talesek acknowledges that "*Visionary Anatomies*" is a part of the dialogue begun in these earlier venues. Talesek also reminds us the dialogue between artists and scientists has an extended history. Some of the details of this history are outlined in Michael Sappol's contribution: "*Visionary Anatomies and the Great Divide: Art, Science and the Changing Conventions of Anatomical Representation 1500-2003.*"

Sappol, a Curator-Historian with the National Library of Medicine, introduces a series of long-standing issues in the history of anatomical representation that include the conventions that govern collaborations among artists and anatomists. He speaks of both the boundaries and dialogue between them. Beginning with the assertion that we think of ourselves as anatomical beings, Sappol then moves to how the subject of anatomical representation, like the placement of "boundaries" between art and science, is not purely academic. It also has reference to our own experience.

What I liked most about these short essays was the chronology it provided. Also of great interest were the engravings included to illustrate the text. For example, although I am acquainted with the history from Galen through Vesalius, the Scottish anatomist John Bell, and contemporary imaging technologies, I had never clearly delineated how the uses of anatomical representations shifted as artistic/scientific conventions, meanings, and audiences altered their perspective on the world. Whereas Vesalius' bodies are often placed in a scene, and other illustrations cited (or parodied) iconic traditions and subjects, by the eighteenth century conventions had changed. The essay further explains that by the end of this century Bell truculently denounced "the vicious practice of drawing from the imagination, " instead of "truly from the anatomical table."

The plates of the artwork convinced me that this is an excellent exhibition, while reminding me of how much is lost when we look at reproductions rather than the works themselves. Some of the art worked better in the small format than others. I loved the sinewy quality and the way the light/dark contrast accentuated it in Mike and Doug Starn's Blot out the Sun #1, which used a combination of techniques found in both the history of photographic processes as well as tools of today's digital age. Katherine du Tiel's Inside/outside series also effectively translated despite the small format.

Images reproduced include a Spine/Back and Muscle/Hand that were printed so that it is difficult to separate the within from the without. Each confuses the lines between anatomy and physical reality, and combines an elegant aesthetic with a subdued whimsy.

The limitations of seeing art through a publication were more obvious in Stefanie Bürkle's Panorama Paris Lambda print. It was immediately evident that her work follows in the epic style that has become associated with contemporary German photographers (e.g., Andreas Gursky, Thomas Struth, Thomas Ruff, and Candida Hofer). This piece contrasts the Musée National d'Histoire Naturelle, Paris with a terminal in Charles de Gaulle airport. Bürkle places an anatomical model of a man standing on his head in the museum room, which is stacked full of encased creatures, objects of natural history.

Visually the juxtaposition is intended to prompt a comparison between cultural and social values in the nineteenth and twenty-first centuries. Impressive as I assume it is in the physical space, the contrast was primarily in my mind when pondering it in the catalogue.

The reduction of a 31.5x78 inch piece to a two-page spread that measured 13" across mitigated its power. Similarly, Richard Yorde's piece looked impressive, but it was too large to read in the small size provided.

I was particularly grateful that contributors included statements about each work. As someone who enjoys knowing the process and how the artist "sees" the project, I found this information helped round out the book as well as my understanding of what I was actually looking at when viewing the flat reproductions. For example, (art)n's contribution Pet Study 2 (Lung Cancer): Man Ray/Picabia Imitating Balzac is a virtual sculpture modeled on a photograph of the painter Francis Picabia taken by Man Ray.

I would not have conceptualized the image at all without the statement that explained that when it is viewed through a backlit barrier screen the assembled images are perceived by the viewer to exist in three dimensions. The statement also explains that similarity exists between the way that (art) builds up the multiple layers of the virtual sculpture and the way that contemporary medical scanning technologies deconstruct the body in a series of planes.

In closing, the "Visionary Anatomies" catalogue is a splendid overview of contemporary work that references the body. It is available in its entirety at http://www.nation-alacademies.org/arts/Visionary_Anatomies.html. I highly recommend it, with the footnote that those who can visit the show will no doubt find the actual works offer more when seen full size in the physical world. Although no longer showing at the NAS, the show will be on display at the Monmouth Museum in Lincroft, New Jersey from 17 September - 27 November 2005.

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LEONARDO NETWORK NEWS

SPECIAL SECTION

DEGREES OF FREEDOM: MODELS OF CORPORATE RELATIONSHIPS

by Sara Diamond

The author discusses three models of corporate partnership that support the creation of new-media art: directed altruism, skunk works (product development), and regulated self-interest. Similar activities can occur across these models, but expectations, criteria for assessment and final outcomes may differ. Clarifying the rules of engagement for arts organizations and artists when they work with corporations is critical to success for both artists and companies. This essay provides a framework and examples for each model from Canada, Finland, the United Kingdom and the United States. It evaluates failures as well as successes.

SPECIAL SECTION

REVELATIONS: AN ARTIST IN RESIDENCE AT THE JET PROPULSION LABORATORY

by Daniel E. Goods

The author's two years as an artist in residence at the Jet Propulsion Laboratory have led him to an appreciation of how similar his thinking and work process are to those of the laboratory's engineers and scientists. For both, certain ideas and processes at first appear crazy and impracticable, but vision and persistence bring them to realization. The three installations described in this article pertain to a future mission that, if successful, will locate a planet similar to earth and once again change humanity's understanding of its position in the universe.

THEORETICAL PERSPECTIVE

LIBERATION OR CONTROL: DISOBEDIENT CONNECTIONS IN CONTEMPORARY WORKS

by Bojana Kunst

The concept of connection has assumed a very ambivalent status today. Being connected exposes the liberating potential of connected public participation, which has changed our understanding of political and intimate life. At the same time there is also a strong fear at work that this very potential could result in a more rigid form of contemporary life. Connection, as understood in this article, is something procedural that can at the same time be disobedient to its own procedure. This disobedience can be concretely observed in certain contemporary artistic works, for example in the project *wPack* from Intima Virtual Base.

SPECIAL SECTION

WELCOME TO THE NEIGHBOURHOOD: BELONGING TO THE UNIVERSE

by Adam Nieman

Space travel could be an experience available to everyone. This paper describes *Welcome to the Neighbourhood*, a combination of sculpture and multimedia designed to help

people inhabit the solar system (without leaving the earth). The project aims to empower astronomers and non-astronomers alike to form an authentic conception of their place in the cosmos. The author discusses the sculptures that inspired the idea for the project, including the largest known kinetic sculpture ever built (60 light-years across), and then outlines *Welcome to the Neighbourhood* in the context of a broader discussion of public engagement with science and the role of space art in transforming people's experience of "being in the universe."

SPECIAL SECTION

ARTISTS IN INDUSTRY AND THE ACADEMY: COLLABORATIVE RESEARCH, INTERDISCIPLINARY SCHOLARSHIP AND THE CREATION AND INTERPRETATION OF HYBRID FORMS

by Edward E. Shanken

The author surveys contemporary artist-engineer-scientist collaborations in industry and the academy and considers a variety of theoretical and practical issues pertaining to them. Given the increasing dedication of cultural resources to engage artists and designers in science and technology research, the author concludes that more scholarship must analyze case studies, identify best practices and working methods, and propose models for evaluating both the hybrid products resulting from these endeavors and the contributions of the individuals engaged in them.

SPECIAL SECTION

WINDOWS TO THE WORLD, DOORS TO SPACE: THE PSYCHOLOGY OF SPACE ARCHITECTURE

by Andreas Vogler And Jesper Jørgensen

Living in a confined environment with minimal external stimuli available, such as a space habitat, is a strain on normal human life and puts great pressure on groups and individuals. Designers working on a space habitat not only must work on its functional role, but also must integrate functionality with mental representation and symbolic meaning. Space-connection interfaces such as doors and windows act as "sensory organs" of a building. They allow inside-out communication, but also allow the user to control the flow of light and air, which in a direct or indirect way are communication mediums. In this paper the authors advocate a closer connection among architecture, anthropology and psychology in designing space habitats as part of a new concept of environmental design strategy in space architecture.

LEONARDO NETWORK NEWS

NEW CHAIRS ELECTED FOR LEONARDO EDUCATION FORUM

Three new chairs and co-chairs have been elected to lead the Leonardo Education Forum through the next three College Art Association conferences. Yianni Yessios was elected for a 1-year term and will chair the group for the 2006 conference in Boston, MA; Amy Ione was elected for a 2-year term and will chair the group for the 2007 conference in New York, NY; and Eddie Shanken was elected for a 3-year term and will chair the group for the 2008 conference in Dallas, TX.

The Leonardo Education Forum consists of artists, scientists, engineers and scholars who belong both to the Leonardo Network and to the College Art Association. The purpose of the Leonardo Education Forum is to develop joint actions between the two organizations, such as promoting the work of artists and art historians in the art-science and art-technology interdisciplinary fields.

The working group will develop, among other things, proposals for sessions at the CAA meetings and mentoring programs for students in the field. Information about the Leonardo Education Forum and activities including information about the 2005 CAA conference in Atlanta, GA, can be found on the Leonardo web site at: <http://www.leonardo.info/isast/events/leonardocaa.html>.

Students, faculty and professionals working in the art/science/technology field are encouraged to join the working group to help build the activities of this dynamic community. To join the working group, visit the discussion list at: <http://webexhibits.org/about/leocaa.html>. The discussion list is open to any person both a member of CAA and of Leonardo/ISAST.

***LMJ* EDITOR-IN-CHIEF NICOLAS COLLINS EXTENDS CONTRACT**

Leonardo/ISAST is pleased to report that Nic Collins has agreed to extend his contract as editor-in-chief of **Leonardo Music Journal** (LMJ) through 2007.

New York-born (1954) and -raised, Collins studied composition with Alvin Lucier at Wesleyan University, worked for many years with David Tudor and has collaborated with numerous soloists and ensembles around the world. As a composer he helped pioneer the use of microcomputers in live performance and has made extensive use of "home-made" electronic circuitry, radio, found sound material and transformed musical instruments. From 1992 to 1995 he was Visiting Artistic Director of Stichting at STEIM in Amsterdam and in 1996-1997 a DAAD composer in residence in Berlin. In September 1999, he joined the faculty of the School of the Art Institute of Chicago as the chair of the sound department. Collins has long been active as a curator of concerts and sound installations (The Kitchen, PS1, the Clocktower, Podewil). His recordings are available on the Lovely Music, Nonesuch, Trace Elements, PlateLunch and Periplum record labels.

Collins began serving as **LMJ** editor-in-chief beginning with Volume 8 in 1998. Collins expects to see evolutionary change in both form and content in **LMJ** in the coming years. The appointment of features editors will broaden the purview of the journal while providing continuity from issue to issue. An active web component whereby all authors would be invited to incorporate audio (MP3) and video (MPEG) illustrations, as well as active web links, in their submissions is planned. Closer integration between **LMJ** and the other Leonardo publications - **Leonardo**, **Leonardo Electronic Almanac** and the Leonardo Book Series - is also currently under exploration. Forthcoming volumes of **LMJ** include **The Word: Voice, Language and Technology** (2005) and **Noises Off: Sound beyond Music** (2006).

LMJ is published annually by the MIT Press. **LMJ** is devoted to aesthetic and technical issues in contemporary music and the sonic arts. Each thematic issue features artists/writers from around the world, representing a wide range of stylistic viewpoints and fostering connections between the contemporary arts, sciences and new technologies. **LMJ** provides a scholarly, international, peer-reviewed forum for musicians, composers, sound artists, scientists, researchers, theoreticians, technicians and instrument builders to discuss and present their work in a context of mutual influence and exchange. Each volume of **LMJ** is accompanied by an independently curated audio or multi-media CD.

For more information, visit <http://www.lmj.mit.edu> or contact Nic Collins at [ncollins \[@ \] artic \[dot \] edu](mailto:ncollins@artic.edu).

LEONARDO NETWORK NEWS COORDINATOR: Kathleen Quillian
[isast \[@ \] leonardo \[dot \] info](mailto:isast@leonardo.info)

THE PACIFIC RIM NEW MEDIA SUMMIT (PRNMS)
A PRE-SYMPOSIUM TO ISEA2006
7-8 August 2006, San Jose, California

The ISEA2006 Symposium is being held in conjunction with the first biennial ZeroOne San Jose Global Festival for Art on the Edge in San Jose, California, 5--13 August 2006. As part of the ISEA2006 Symposium, the CADRE Laboratory for New Media at San Jose State University will host a 2-day pre-symposium entitled the *Pacific Rim New Media Summit*, co-sponsored by Leonardo.

With a purview encompassing all states and nations that border the Pacific Ocean, the Pacific Rim New Media Summit is intended to explore and build interpretive bridges between institutional, corporate, social and cultural enterprises, with an emphasis on the emergence of new media arts programs.

In preparation for the summit, seven working groups are currently laying the groundwork for the main areas of investigation to be pursued in depth at the summit: Creative Community, Curatorial, Education, Directory, Eco-Social Activism, Mobile Computing and Urbanity, and Latin American-Pacific/Asia New Media.

Following is another statement from one of the working group chairs, in the continuation of our ongoing series as a build-up to the conference.

PRNMS WORKING GROUP ON PLACE, GROUND AND PRACTICE

by Danny Butt, Place, Ground and Practice Chair
danny [@] dannybutt [dot] net

The Place, Ground and Practice Working Group undertakes cultural and artistic investigations at the limits of collaborative practice. Central to the Working Group is an interest in the critique of imperial power and innovative practices that foster progressive change in the new media environment.

Recognition of indigenous practices and cultural politics suggest alternative ways of thinking about location-specific new media work, and influence our understanding of the Pacific Rim as a geographical formation with a rich pre-European history of cultural exchange. Through curatorial, artistic, media and residency activities, the Working Group draws inspiration from this history to propose alternative visions of dominant new media themes (global culture, intellectual properties, disembodied knowledge), with a commitment to politics that is critical, progressive, and reflexive, while maintaining a vision of optimism and enjoyment.

GROUP MEMBERS

Danny Butt - danny [@] dannybutt [dot] net

Danny Butt is an independent consultant and researcher in the new media, arts and education fields. Previously, he was founding Director of the Creative Industries Research Centre at the Waikato Institute of Technology, Hamilton, where he also lectured in digital media and established the Digital Media Design program. His research interests centre on the social impact of new media technologies; colonization and settler culture; and the development of the creative industries sector in the Asia-Pacific region. For more information: <http://www.dannybutt.net>

Ashok Mathur - <http://www.amathur.ca>

Ashok is a Canada Research Chair in Cultural and Artistic Inquiry (Thompson Rivers University, Kamloops, British Columbia, Canada). He is a novelist, poet, publisher, and cultural organizer.

Candice Hopkins

Candice (Me'tis, Tlingit) is the curatorial fellow at the Walter Phillips Gallery. She has an MA from The Center for Curatorial Studies, Bard College, NY. Her recent curatorial project, *Every Stone Tells a Story: The Performance Work of David Hammons and Jimmie Durham*, opened at the Berrie Center Art Galleries, Ramapo College, NJ in November

2004. Her writing is featured in <http://www.horizonzero.ca>, FUSE Magazine and in the books *Transference*, *Tradition*, *Technology: Native New Media Exploring Visual and Digital Culture*, and *Making a Noise! Aboriginal Perspectives on Art*, *Art History*, *Critical Writing and Community*, both published by the Walter Phillips Gallery. Hopkins has presented on her practice at Tate Britain, Northern Gallery for Contemporary Art, Sunderland, UK, Dak' Art_Lab, Senegal and in Canada at the Alberta College of Art and Design.

Cheryl L' Hironnelle - <http://www.ndnnrkey.net>

Halfbreed (metis, cree, german, polish) interdisciplinary artist (musician, net.artist, performance artist, storyteller) and educator currently residing in Vancouver B.C.

Jason De Santolo - <http://www.jumbunna.uts.edu.au>

Jason is a descendent of the Barunggam and Garawa peoples. He works in the legal-policy and creative research realms and has collaborated on various projects with Indigenous peoples in Australia, Aotearoa and more recently the U.S. Jason is currently a research fellow within Jumbunna Indigenous House of Learning at University of Technology, Sydney.

Jenny Fraser - <http://www.fineartforum.org/Gallery/cybertribe/>

Jenny was born in Far North Queensland and her family hails from the Yugambah and Munuljahli of the Bundjalung Nation in South East Queensland and the Clans Fraser and McNamara on her other side. Because of the diverse creative mediums Jenny uses, much of her work defies categorization. More recently her work takes iconic and everyday symbols of Australian life and places them into a context that questions the values they represent. With a laconic sense of humor she picks away at the fabric of our society, exposing contradictions, absurdities, and denial. Jenny founded and curates cyberTribe, an Indigenous online Gallery that aims to encourage the production and exhibition of Indigenous Art with a focus on the digital.

Her commitment to spreading the word about new media arts and its potential as an expressive medium for Indigenous artists is reflected in the development of this website *Blackout*, that showcases and promotes the work of participants to the world. Jenny's work on this site has seen it evolve into an important resource for people interested in Indigenous new media practitioners in Australia.

Rachel O' Reilly

Rachel currently works as a curator of film, video and new media at the Queensland Art Gallery, Brisbane, Australia, home of the Asia Pacific Triennial. Prior to this she was involved in the independent media and arts festival **This Is Not Art** (Newcastle, Australia) as a festival manager, and as a program manager of the independent National Student Media Conference. She writes for the Australian new media arts publication, **RealTime**, and was also managing editor of the Australia Council's **How To Where To** guide to independent arts project management for early career artists and cultural workers. She has a background in comparative literature and cultural studies, and an ongoing critical interest in cross-cultural and sub-cultural curatorial and programming initiatives, and emerging artforms.

Lisa Reihana - <http://www.lisareihana.com>

Lisa is a Maori artist who has played a leading role in the development of film and multimedia art in Aotearoa, New Zealand. Her work demonstrates a keen interest to communicate complex ideas about indigenous identity and bi-cultural living, and a desire to address and engage with contemporary experience through diverse media. Her installations are collages drawn from eclectic sources. Her examination of cultural histories uses photography; sculpture and time-based arts.

3 -19 March 2006

The biennial Adelaide Festival of Arts is Australia's leading multi-arts festival. Artists' Week is the major visual arts component of the Festival and features a program of free artist talks, panel discussions and workshops. Media State is a special initiative that will focus on new media projects and collaborations.

In the lead-up to the ISEA2006 Pacific Rim New Media Summit (San Jose, California, August 2006), members of the Directory, Organizations and Residencies Working Group will meet in Adelaide as part of the Artists' Week/Media State program and provide a public platform to introduce the Pacific Rim New Media Summit and Working Group initiatives.

BYTES

***** CALL FOR PAPERS *****

LEONARDO MUSIC JOURNAL 16 (2006)
NOISES OFF - SOUND BEYOND MUSIC

These days sound is more than just music. Museums, galleries and artists' studios are getting noisier: it's not that there is so much more "Sound Art," but rather that so much more art has sound. Cellphone ringtones generated four billion dollars in sales worldwide in 2004. Incoming email and outgoing popcorn announce themselves with plops and gongs and boops and beeps - the emerging field of "sonification" addresses this proliferation of all these "earcons" and other representational uses of sound. Sound design is a vital part of Hollywood films and computer games. While CD sales shrink with the proliferation of peer-to-peer file exchange, the creative use of sound is expanding in almost every other part of our lives.

For the next issue of Leonardo Music Journal we invite papers on the expanded role of sound in art, science, business and everyday life. Topics could include (but are not limited to): audio art, radio art, phonography; sound design for video, film, and gaming; the role of sound in performance art, theatre, dance; sonification; architectural acoustics; instrument design.

DEADLINES

15 October 2005 - Rough proposals, queries
1 January 2006 - Submission of finished article

Address inquiries to Nicolas Collins, Editor-in-Chief, at:
ncollins [@] artic [dot] edu.

Finished articles should be sent to the LMJ Editorial Office at
lmj [@] leonardo [dot] info.

Editorial guidelines and information for authors can be found on our Information for Authors page.

Note: LMJ is a peer-reviewed journal. All manuscripts are reviewed by LMJ editors, editorial board members and/or members of the LMJ community prior to acceptance.

SCHOOL OF ART INSTITUTE CHICAGO
FACULTY POSITION IN FILM, VIDEO AND NEW MEDIA

The Department of Film, Video, and New Media at the School of the Art Institute of Chicago invites applications from artists working in video to teach and expand an innovative curriculum in moving image media. We are looking for artists who work with various applications of video/digital media, experimental narrative and non-fiction forms, in-

stallation, video performance, interactive environments and web-based work.

Candidates should have a strong conceptual and historical grasp of contemporary issues in the intersecting worlds of independent video production, experimental filmmaking, and new media. The department is committed to alternative forms and practices that emphasize experimentation, innovation, and the hybridization of existing media and modes of presentation. Candidates should demonstrate the ability and desire to participate in curricular initiatives; should be able to work with undergraduate and graduate students in an interdisciplinary, fine arts context; and should have advanced proficiency in one or more areas of the media arts. Applicants must have an active professional creative practice. Teaching experience preferred. The position is full-time, tenure-track and begins in the fall of 2006. Rank and salary are commensurate with experience.

Please send a letter of application, curriculum vitae, artist's statement, teaching philosophy, portfolio samples which may include CD-Rom, DVD, VHS, mini-DV, and/or website URLs, names and contact information for three references, and an SASE (if you wish to have the materials returned) by November 15, 2005 for priority consideration to:

FVNM Search/LEA
School of the Art Institute of Chicago
Office of Deans and Division Chairs
37 South Wabash Avenue
Chicago, IL 60603

For more information on the School and its programs, available faculty positions, and details regarding application, consult <http://www.artic.edu/saic/public/jobs>. For additional assistance, questions may be directed to Shanna Linn at slinn@artic.edu, 312.899-7472.

CHAIRPERSON, DEPARTMENT OF ART, MUSIC & TECHNOLOGY

Applications and nominations are requested for the position of Chairperson in the Department of Art, Music, & Technology at Stevens Institute of Technology. The department has two newly developed programs: Art & Technology and Music & Technology. The Chair will be responsible for working with the Directors of the Music and Art Programs in matters of curriculum development, policy, and fundraising. The applicant must have a substantial international or national presence in the art or music community beyond the Institute. The position will start as soon as the candidate is available. Deadline to apply is December 15, 2005, but applicants will be considered sooner. For further information about the department, see <http://www.hum.stevens.edu/ArtMusicTechnology/>. Nominations and letters of application should be sent to Dean Erich Kunhardt, Imperatore School of Sciences and Art, Stevens Institute of Technology, Hoboken, NJ 07030, U.S.A.

NEW MEDIA/INTERMEDIA

Purdue University.
Entry level Assistant Professor. Tenure track.
Begins August 14, 2006.

Applicant must be practicing New Media/Intermedia artist with strong theoretical basis. M.F.A. or equivalent professional experience required. Professional experience and university teaching preferred. Teach cross-disciplinary courses and develop curriculum in New Media/Inter-media across four divisions (Art & Design, Dance, Music, and Theatre) of Patti and Rusty Rueff Department of Visual and Performing Arts <http://www.cla.purdue.edu/academic/vpa/> and Envision Center <http://www.envision.purdue.edu>. Continue professional work in creative endeavors and/or research beyond Purdue University and participate in usual departmental activities. Send letter of introduction, resume of professional and academic experience, digital portfolio of representative work, copies of reviews of art works, statement of teaching interests and previous teaching experience, three names and contact information of current references, and SASE for the re-

turn of visual materials to Star Brown, Pao Hall, 552 West Wood Street, West Lafayette, IN 47907-2002, U.S.A. Purdue University is an Equal Opportunity/Equal Access/Affirmative Action employer. Women and minority candidates are especially encouraged to apply. (preferential): 1/31/06 or until filled.

DIRECTOR, SCHOOL OF FILM AND DIGITAL MEDIA
University of Central Florida

The School of Film and Digital Media at the University of Central Florida seeks a visionary Director to lead its growth into an internationally prominent center for creative innovation and scholarship in film and digital media.

The Ph.D., M.F.A. or comparable industry experience is required. The successful candidate must have a record of either scholarship or professional creative activity consistent with the standards for appointment as a tenured associate or full professor.

A significant record of accomplishment as a successful cinema or media professional, or in a related academic field, is required. The Director must have demonstrated leadership skills, a clear understanding of the potential of the field and the ability to work effectively with the important constituencies of the university, community and industry.

The School of Film and Digital Media consists of the Film and Digital Media Divisions, the Center for Research and Education in the Arts, Technology and Entertainment (CREATE) and the Florida Interactive Entertainment Academy (FIEA). The Director would oversee all of these components.

The University of Central Florida is a growing metropolitan research university in Orlando, enrolling nearly 45,000 students.

The School of Film and Digital Media has more than 1,200 students and 37 faculty members with facilities on the main campus in East Orlando as well as a new graduate and professional center in downtown Orlando where CREATE and FIEA are housed. There is also a Downtown Media Arts Center.

Bachelor of Arts degrees in Cinema Studies and World Cinema, a B.F.A. in Film (including Production and Screenwriting) and a B.A. and B.S. in digital Media (Visual Language, Internet and Interactive Systems) are offered. A graduate program beginning Fall 2005 offers the M.F.A. in Entrepreneurial Digital Cinema and the M.A. in Visual Language and Interactive Media. The M.S. in Interactive Entertainment will be offered pending approval.

Applicants for the position should submit: 1) a letter of application, 2) a complete vita and 3) the names and contact information for three references. Applications should be sent to Dr. Mary Alice Shaver, Chair, Director Search, School of Film and Digital Media, P.O. Box 163120, University of Central Florida, Orlando, FL 32816-3120, U.S.A. Review of applications will begin on October 4 and continue until the position is filled. UCF is a culturally diverse university and an Affirmative Action/Equal Opportunity Employer. Search documents may be viewed by the public upon request, in accordance with Florida statute.

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