ALL DIGITAL

Charles Sandison

Lynn Hershman Leeson

John F. Simon, Jr.

Christa Sommerer
& Laurent Mignonneau

Paul Chan

Leo Villareal

Anne-Marie Schleiner

ALL DIGITAL

Margo A. Crutchfield
Senior Curator

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FOREWORD

JILL SNYDER Executive Director

Major exhibitions of digital art have, to date, been presented only occasionally in the United States. MOCA Cleveland's pioneering exhibition *All Digital* introduces viewers to internationally recognized new media artists with the aim of fostering an appreciation for this exciting current in contemporary art. *All Digital* also provides a fascinating visual and intellectual nexus to address issues of vital importance to Cleveland at a time when the city is reinventing itself—effecting a change from a manufacturing economy to one of information and technology. To delve into the rich terrain of digital art and capitalize on the abundant intellectual capital in this city, MOCA, together with Case Western Reserve University in collaboration with the Cleveland Museum of Art and the Cleveland Institute of Art, has organized an exciting exhibition-related symposium—*Understanding the New Dynamic: Art, Technology and the Mind.* This two-day event convenes scholars in many disciplines from around the world to discuss new directions in the fields of cognitive science, digital art, visual literacy and museum education.

All Digital would not have been possible without the support of many generous partners, foundations and corporations. I am deeply grateful to an anonymous donor and to the Andy Warhol Foundation for the Visual Arts for their early exhibition sponsorship. With this help, MOCA commissioned two major works and is presenting two world premieres from among the eight participating artists. CASE VP for Information Services & CIO Lev Gonick played a crucial leadership role in securing the extensive technical equipment needed for the exhibition and steered our ability to build upon *All Digital* as a platform for discourse. Through Lev's direction, MOCA forged a dynamic partnership with the New Media Consortium in Austin, Texas and leveraged contacts with our presenting and supporting sponsors. Len Steinbach, CIO at the Cleveland Museum of Art; Jurgen Faust, Dean of Integrated Media and Chair of the T.I.M.E. Program at the Cleveland Institute of Art; and Merlin Donald, Professor and Chair of the new Department of Cognitive

Science at CASE worked together, adding their intellectual rigor, enthusiastic guidance and technical support to *Understanding the New Dynamic: Art, Technology and the Mind*, the outstanding interdisciplinary symposium accompanying the *All Digital* exhibition.

MOCA's Senior Curator, Margo Crutchfield, has channeled her creative energy and intellectual prowess in developing *All Digital*. I am grateful to her for her dedication and ability to corral some of the most challenging new media artists of today. Special thanks are due to Ray Juaire, Exhibitions Manager for his persistence, problem solving and technical expertise in this challenging undertaking. I acknowledge with deep appreciation MOCA's committed Board of Directors whose ongoing support allows us to venture into exciting new territory such as with the *All Digital* exhibition. I also recognize MOCA's staff for bringing its collective talents to managing with aplomb the myriad complexities of presenting this exhibition. Finally, I join Margo in thanking the participating artists. Each has put on loan to us their inspiring innovation and creativity and we are indebted to them.

ENTER

MARGO A. CRUTCHFIELD Senior Curator

Throughout history, and especially during the past century, artists have explored the rich possibilities that innovations in science and new technologies can bring to art. With the invention of photography in 1839, followed by the succession of new technologies developed throughout the 20th century, the convergence of art, science and technology has enriched, transformed and, in many cases, revolutionized artistic practice. From examples such as Eadweard Muybridge's *Studies in Animal Locomotion* (1888), to developments such as the Experiments in Art and Technology (EAT) projects and the emergence of video art in the 1960s, artists have drawn inspiration from science and engaged new technologies in their art.[1] With the advent of the computer at mid-century—and its escalating use and pervasive influence since then in our lives—artists have continued to explore and harness the vast potential that digital (computer-generated) technologies offer for their creative endeavors.

The digital revolution, brought on by the explosive growth and dissemination of digital and telecommunication technologies, expanded with unprecedented speed towards the end of the 20th century. Unparalleled advances in the Internet, the development of virtual space and a broad range of digital media, including sound, imagery, graphics, video and animation, resulted. By the end of the 1990s, the impact of the digital revolution had permeated almost every aspect of life in the industrialized nations. Digital technologies have produced a networked world in which humans can communicate via the Internet almost instantaneously over any distance, where vast amounts of information and knowledge are available at the click of a mouse, where computer screens and the worlds contained within them have become not only an extension of our minds but an alternate reality. Of significance, too, has been the development of online cultures and communities of individuals that interact globally in virtual space. An extensive, networked world, with connections between people who are very often not face-to-face, is a new, parallel reality. Needless to say, the impact of this technology on art has also been profound. The computer has significantly influenced and, in many cases, revolutionized art and the creative process, and as we move
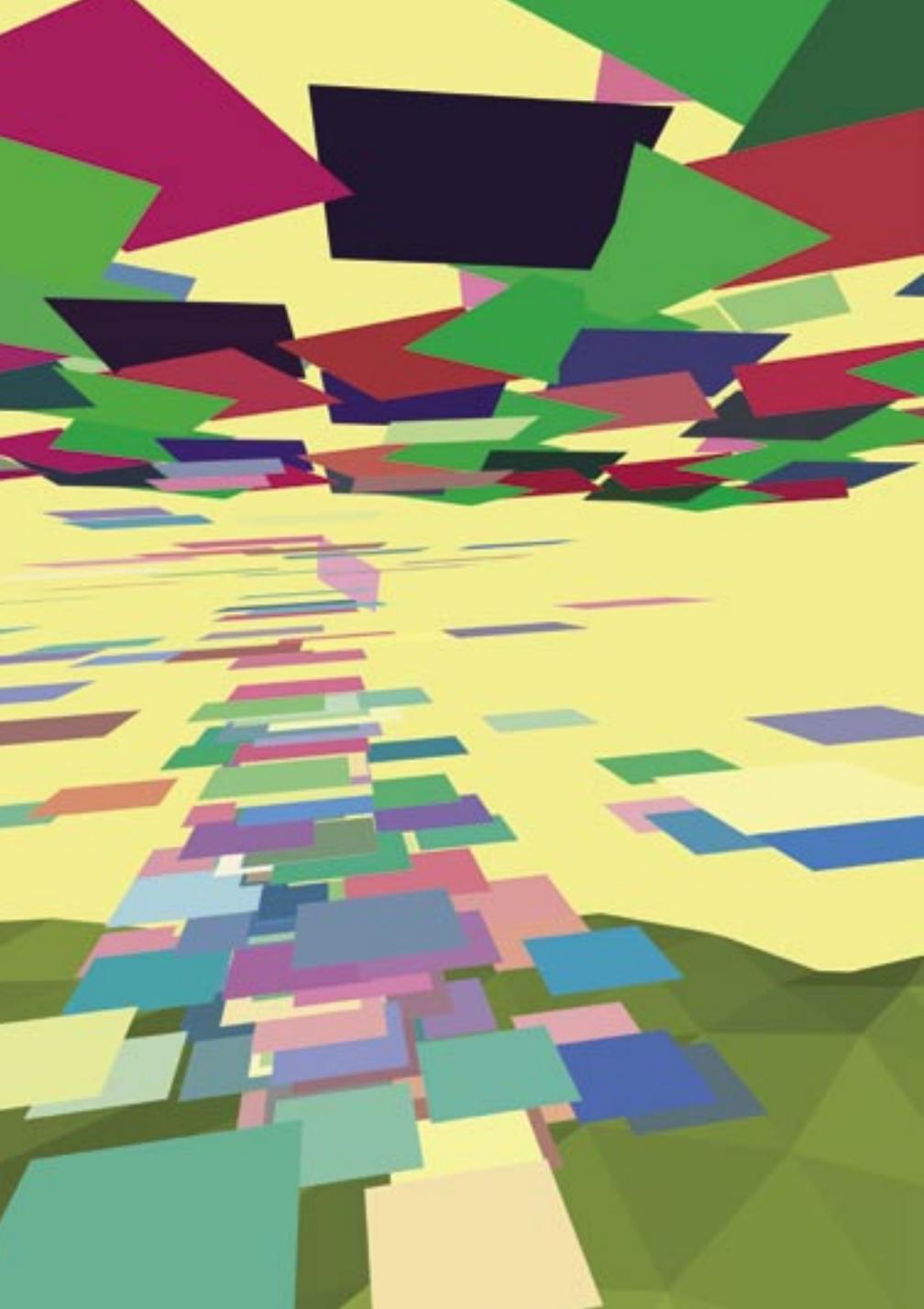
further into the 21st century, computer-generated art, or what is now known as "new media" or "digital art," has become a fluid, ever-expanding and rapidly evolving field that has proliferated worldwide.

All Digital brings together compelling examples of artistic achievement by a group of international artists in the new media subgenres of installation art, software art, animation, interactive computer installation and the explosive field of gaming. In employing digital technologies in their work, Charles Sandison (Scotland/Finland), Anne-Marie Schleiner (US), John F. Simon, Jr. (US), Christa Sommerer (Austria) and Laurent Mignonneau (France), Lynn Hershman Leeson (US), Paul Chan (Hong Kong/US), and Leo Villareal (US) expand the expressive and aesthetic possibilities of art, radically extending the "palette" and materials available to them and the forms that art can take. Their art is kinetic. It can be interactive, transforming the more customary role of the viewer from observer to that of active participant, collaborator or even co-creator. These works are dynamic, often hybrid forms of art, with imagery that evolves over time and has possible combinations of color and form that, in some cases, extend ad infinitum. This is art that can exist as objects in the "physical" world, or as embodiments of form, pattern, color, sound and ideas in the non-linear,

JOHN SIMON
Fountain, 2004 (screen still)
Projection
Software, Apple G4 PowerBook®
8 x 10 foot diptych

multi-layered framework of cyberspace. With computer-generated imagery that can perpetually reproduce and mutate, or words that can be transformed through code into fluid, sculptural entities, new domains unfold and entirely new forms of art are being created. We have entered an era in which artists' imaginations are not limited to static materials such as paint, canvas, stone, found objects or other more conventional media. Artists can "effortlessly reposition and combine images and colors within the friction-less and gravity-free memory space of the computer, endowing them with an image-making freedom never before imagined."[2] In exploring and harnessing the vast potential that computers and digital technologies offer, these artists have ventured into an exciting, rapidly accelerating domain of creative possibilities.

John F. Simon, Jr.'s abstract compositions are works of code art that are projected or displayed on laptops and liquid crystal diode (LCD) panels mounted to the wall. His software generates colors and forms in constant motion with imagery that evolves continuously so that the works become, in a sense, "living compositions on a computer screen."[3] **Charles Sandison** uses digital technology to transform words or text from a visually static entity into
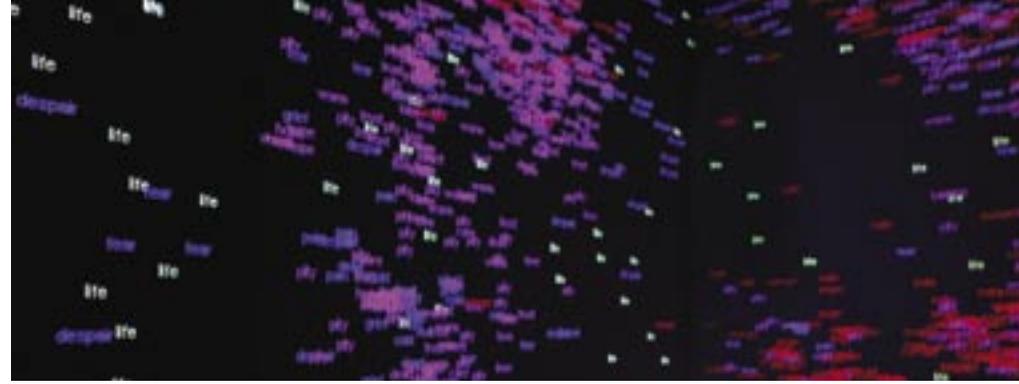
a fluid and dynamic one that assumes sculptural form as words are propelled into three-dimensional space. *Index* (2006), a large-scale installation of projected data commissioned specifically for *All Digital*, is an immersive environment in which the words of an entire encyclopedia are transformed into fluid clusters of text that stream throughout the gallery over floors, walls and ceilings. **Paul Chan** transforms animation—a tradition-ally two-dimensional medium—into a three-dimensional sculptural installation by projecting his computer-gener-ated images onto a large rectangular screen suspended off the floor. *Instances* (2005), **Leo Villareal's** triptych, is made from thousands of light emitting diode (LED) lights, custom circuitry, a microcontroller and aluminum. In this work, computer programmed LEDs generate pulses of light that appear to flash across the surface in constantly moving patterns so that the most intangible of mate-rials—light and motion—are transformed into scintil-lating wall sculptures.

CHARLES SANDISON
Rage Love Hope Despair, 2004 (detail)
Projected data: code, computers, projectors
Gallery installation, dimensions variable

Another work in *All Digital* that stretches customary notions of what art is and can be, is *PS2 Diaries* (2004), a gaming-based work by cyberfeminist and game modifier **Anne-Marie Schleiner** who "hacks" or intervenes in the virtual game world to analyze and subvert social and political conventions.

Two groundbreaking interactive computer installations bridge the virtual and the "real" or physical worlds and also defy current expectations of what form art takes. The first, titled *DiNA* (2005-6) by **Lynn Hershman Leeson**, is an installation in the form of a projected virtual persona that embodies "artificial intelligence." Equipped with artificial intelligence mark-up language, voice-recognition technologies and wired to the Internet, this "cyber being," can "converse," answering questions prompted by museum-goers and viewers in the physical world. The second installation, *LifeWriter* (2005–6), is an interactive "virtual" sculpture

created for *All Digital* by **Christa Sommerer and Laurent Mignonneau** in which artificial intelligence and artificial life forms are also fundamental components. In this work, viewers write text with a typewriter. The text is translated into code that then materializes into virtual creatures, which are programmed to mimic biological behavior—growing, eating, reproducing and dying in a virtual environment. Their behavior, however, is not entirely predetermined but subject to random occurrences, so that, in the words of the artists, "they take on a life of their own."[4] These are works of art "that are evolving towards living art forms"[5] and, as such, are on the brink of vast new artistic territories. Hershman Leeson, Sommerer and Mignonneau are in the vanguard of artists entering territory where creativity translates into the actual construction of alternate realities, into the development of completely new art forms that bridge the virtual and real worlds and begin to erode the increasingly ambiguous barrier between the inanimate and the animate.

LYNN HERSHMAN LEESON
DiNA, 2004–5
Networked artificial intelligent agent
Artificial intelligence mark-up language and Java code, Pulse 3D Veepers software,
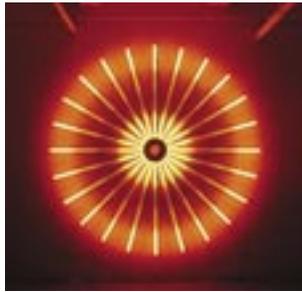voice-recognition software, text-to-speech software, PC, microphone
Projection: 10 x 5 feet

CHRISTA SOMMERER and LAURENT MIGNONNEAU
LifeSpacies, 1997 (screen still, detail)
Interactive computer installation
Dimensions variable

In investigating and applying the dynamic potential of emergent technologies to their artistic practice, the artists in *All Digital* create inventive and, in some cases, revolutionary ways of interpreting, manipulating and visualizing information and ideas. As artists can often be, they are "sense-makers" or "seers" and serve as beacons, calling attention to a number of important issues that are crucial to this moment in time. The creation, continuing expansion and co-existence of alternate or virtual realities with the world as we know it presents perhaps one of the most exhilarating but also challenging conditions facing us today. The conflation of the real and the virtual worlds, and how we negotiate through them, will continue to determine many aspects of our lives. Our relationship to computers and the multiple realities that programmers spawn is a key topic. How this relationship affects or transforms our concept of self—and even our physical being—as artificial organs and genetic engineering bring us closer to being cyborgs—are ever

LEO VILLAREAL
Here Comes The Sun, 2004
LEDs, circuitry, hardware
9 feet in diameter

more pertinent issues. As curator Christiane Paul has aptly commented, works by artists such as Sommerer and Mignonneau "raise fundamental questions about human interaction with increasingly 'intelligent' machines and possible levels of human-machine symbiosis." The creation and incorporation of artificial intelligence and artificial life forms, in art and in life, raises fundamental questions about the evolution of intelligence, the nature of consciousness, what constitutes "presence," and ultimately what it means to be alive in a "post-human" world.

In presenting the efforts of exemplary artists working with new media today, *All Digital* points not only to current developments in the evolution of art in the 21st century, but also to significant advances that new technologies make possible in the evolution of human cognition and perception—in the way we think, feel and perceive ourselves and the changing world around us. Digital technologies are redefining human existence as we know it, redefining our relationship to the world, to our fellow humans, to ourselves and to machines. Through their art on view in *All Digital*, the eight featured artists examine, explore and challenge us to understand the impact that new technologies have on what it means to be human as we venture into vast new cognitive and perceptual frontiers.

NOTES

1 For an excellent short history of the relationship between technology and art, see Christiane Paul's "Introduction," in *Digital Art* (London, New York: Thames & Hudson, 2003), 7–25. Michael Rush also provides a history of new media in *New Media in Art* (London, New York: Thames & Hudson, 2003). For another discussion on the relationship between art and science in the 20th century, see Christa Sommerer and Laurent Mignonneau, eds., *Science@Art* (Vienna/New York: Springer-Verlag, 1998), 10–13.

2 George Fifield, quoted in Rush, *New Media in Art*, 180.

3 John F. Simon, Jr., in his artist statement of September 2005.

4 See "Art as a Living System," in Sommerer and Mignonneau, *Science@Art,* 148–61.

5 Ibid.

CONVERGENCE OF ART, SCIENCE AND TECHNOLOGY?

JEFFERY SHAW

When one considers the visions which accompanied the development of contemporary art over the last 30 years—the kinetic art of the 1950s, the "open artwork" (happenings, environments, performances, land art, etc.) of the 1960s, the conceptual and social art forms of the 1970s—one finds that these visions have interesting and astonishing parallels in the technological developments of the 1990s. Interactivity creates an intimate relation between the artwork and the viewer, telecommunications permits a radical extension of social interactions, simulation gives direct form to conceptual propositions. Of course we cannot foresee if science and technology will bring about a fulfillment or finale of these utopian artistic movements. But certainly there is an awakened desire to embody ourselves within these new territories of endeavour and experience.

The activity of both art and science has always been the interpretation and recreation of reality. It is an exercise of the human imagination, creating virtual realities which embody tentative structures of meaning. The world appears to us in the light of these fictions that we project onto its surface and art arbitrates this discourse between reality and illusion. The traditional activity of art has been the representation of reality—the manipulations of materials to create tangible mirrors of our experience and desire. Today, the simulational effectiveness of the multimedia and "televirtual" technologies offers us a new medium of expression and also the cosmography of a new space of visions and visualization. Using the mechanisms of the digital technologies the artwork can become an immaterial digital structure encompassing synthetic spaces which we can literally enter. Here the viewers are no longer consumers in a mausoleum of objects, rather they are travelers and discoverers in a latent space of sensual information, whose aesthetics are embodied both in the coordinates of its immaterial form and in the scenarios of its interactively manifest form. In this

temporal dimension the interactive artwork is each time re-structured and re-embodied by the activity of its viewers.

Certain characteristics of the new technologies are significant. Interactive computer graphics has become a shared language in many fields of research, and as a consequence a great diversity of information coexists that can be correlated in the digital environment. This is a unique situation historically and culturally, one which artists and scientists can take advantage of to forge a new discourse. One consequence is that art and media technology centers are being established worldwide to facilitate a new meeting ground between artists and scientists. And the proliferation of media events, exhibitions and festivals also presents pragmatic evidence that art and science are experiencing a vigorous renaissance of creative interrelationships.

Multimedia telecommunication and networking is heralding a fundamental transformation of our social and cultural paradigms. Tele-virtual-reality has become the appropriate domain for expressing our technological and artistic desires. The new modalities of interactivity, simulation and virtual reality are able to configure an

immaterial yet tangible "newfoundland" of forms and images which we can enter and explore. This fictitious cosmography is searching to constitute those spaces and forms in which it can fully manifest its imaginative orbit.

Of great importance is the research and development of new codes and mechanisms of spatial representation. This has been a basic preoccupation throughout the history of western art. The formulation of a set of spatial coordinates, in for instance Renaissance perspective, provides an underlying aesthetic and existential paradigm within which a culture achieves tentative representation, and thus comprehension of its desires. The recently developed digital imaging technologies offer the artist new methods and new paradigms which extend the spatial identity of the artwork. And not just in terms of the structure of the image itself, but also in terms of a space of interaction between the image and the spectator. On the level of representation, dynamic spaces can be built with inverted perspective, impossible

CHRISTA SOMMERER and LAURENT MIGNONNEAU
LifeSpacies, 1997 (screen still)
Interactive computer installation
Dimensions variable

architectures and infinite amplitudes. In their interactivity these works create bridges into the real environment of the viewer, conjoining virtuality and actuality into a coactive space of dramatized aesthetic experience.

It is also significant that virtual reality is so often an activity of world building, of the creation of socio-urban meta-architectures. Following from the Situationists, we recognize that the city is simultaneously a tangible arrangement of forms and an immaterial pattern of experiences. Its underlying identity is a psycho-geographic network of information—a labyrinth of narratives secreted within its urban framework. The new technologies allow us to create mediated cities that mirror the objective world into this virtual imaginative space. Simulation deconstructs a city's weighty material structures and evokes a fluid poetics of tentative space.

An important paradigm is the "virtual museum." This is not a museum in the traditional sense but more like a "memory theater" where an interactive meta-architecture embodies a store of audio visual information in a form that hybridizes the functionality of a museum, a library and a game arcade. Furthermore the extension of such virtual museums into the network creates a ubiquitous and universal space of access to informational and artistic structures. The nowadays practice of art is bound to traditional structures of exhibition, publication, consumption and economics. Worldwide digitally networked communications offer the opportunity for the development of completely new forms of propagation and dissemination of creative activity. Space, time and inter-action become the design parameters of the televirtual ambiance, and the mass address of the televirtual ether can take the practice of art from the periphery into the center of all social discourse.

One of the pertinent issues in this immaterial cyberspace of forms and ideas is the telepresent extension of our bodies through space and time that these technologies

PAUL CHAN
Happiness (finally) after 35,000 Years of Civilization—after Henry Darger and Charles Fourier, 2000–2003 (screen still)
Digital animation with sound

afford us. The technological deconstruction and artistic reconstruction of our identities in the digital ether is an almost meta-physical enterprise. One can say this despite the apparent lucid simplicity of the games we create (on the Internet, for instance) to embody this surreal multiplicity of our newly discovered telematic being. To put some semblance of adherence into this spiral of recombinant phantasms, a new "pataphysics" of identity and social relations may be the appropriate strategy.

As we project and propel ourselves into these media machines, we must increase their complexity at a furious rate to try to make them embody the range of our human desires. But these machines are not us, and as their complexities increase to the point where they begin to take on idiosyncratic forms of their own, we lose control and become fascinated observers of their capabilities and anomalies. As artists, we shift from the position of creator to that of critical cultivator, first searching to comprehend the possible meanings that emerge from this accumulation of nano circuitry and indeterminate layers of code, then trying to reconstitute those emergent phenomena in such a way that they can become part of an evolving cultural discourse.

What remains are questions concerning actual demonstrable confluences of art and science. There is evidence that contemporary scientific developments have influenced certain currents in art—Impressionism, Cubism, Constructivism and Futurism. There is less evidence that artistic works have directly influenced science. One could argue that the primary intentions of these two forms of creative endeavor are fundamentally different—the one aimed at the object and the other at the subject. In my opinion, the question is more relevant at the level of industrialization of scientific knowledge—in the social arena where science becomes transformed by the specific agendas of exploitative concerns. All artists working with the new technologies have struggled

with the rigid constraints imposed by hardware and software morphologies that have been configured by military, industrial and/or commercial attitudes. Here the artist has a more

ANNE-MARIE SCHLEINER
OUT: Operation Urban Terrain: a live action wireless gaming urban intervention
An artistic intervention in the public space of online games and New York City streets. (screen still)

provocative role with respect to science and technology. That is to expose and even undermine those attitudes by creating a sensibility that posits and implements new relationships between what Siegfried Zielinski calls "media machines" and "media people." Relationships embody the exploration and articulation of human complexities and experiences which is the essential domain of artistic research and practice. The challenge is to apply these artistic skills in the heterogeneous territory of the media machines.

Karlsruhe, Germany
February 1997

Reprinted with permission of the author from *Art@Science*
(Vienna, New York: Springer-Verlag, 1998)

JEFFREY SHAW is a seminal artist working in digital installation art, who since the late 1960s has pioneered the use of interactivity and virtual reality in his work. His art has been exhibited worldwide at major museums and festivals. Shaw is best known for *Legible City* (1989), a work in which the spectator navigates through a simulated city by riding a bicycle into a computer generated virtual urban landscape of words and sentences. From 1991–2003, Shaw was the director of the Zentrum für Kunst und Medientechnologie (ZKM) in Karlsruhe, Germany. He is currently (since 2003) the founding co-director of the Center of Interactive Cinema Research (iCinema) at the University of New South Wales, Sydney, Australia.

ARTISTS IN THE EXHIBITION

MARGO A. CRUTCHFIELD

I'm exploring a subject called "artificial life," a branch of the study of "artificial intelligence" **(the quest to create human intelligence within a computer**).

As yet computers can't reproduce human intelligence; the mind is just too complex. Consequently, some scientists have simplified their goal and now try to simulate more primitive organisms such as algae or insects. In my work, I replace these artificial organisms with words and language, and release them into a computerized environment. They follow the rules they were programmed with, but their behavior can also be affected by randomness—all within a landscape of pixels and bytes.

The conclusion is that simple rules in a dynamic environment result in emergent behavior patterns more complex than the basic rules themselves. This process is referred to as "self-organization" and leads us to ask fundamental questions about the evolution of intelligence.

– CHARLES SANDISON
SUMMER 2005

CHARLES SANDISON

WORDS IN MOTION float, swirl, coalesce and then dissipate in the darkened gallery space. This describes, in part, Charles Sandison's site-specific installations of projected data. His advanced computer programs shape and display projected words that stream over walls, ceilings and floors. Kinetic and seemingly fluid, these words connect, collide, dissolve and reappear—seeming to take on a life of their own. In giving sculptural form and movement to customarily static words, Sandison produces three-dimensional environments in which the viewer becomes literally surrounded and completely immersed in language.

Words have a long history as a primary medium of expression for visual artists, with precedents established in the 1960s and 1970s by such conceptual artists as Joseph Kosuth and Lawrence Weiner, and, earlier still, by Fluxus artists such as George Brecht and Yoko Ono. In the 1980s and 1990s, room-size installations were created by artists such as Jenny Holzer, who activated text with electronic media, or Tatsuo Miyajima, who also used electronic media but employed numbers and symbols. Sandison builds on but extends beyond these precedents by using computer-generated data projections to create his word-based works of art. Nevertheless, despite the level of computer programming and use of new technologies, Sandison considers himself "a painter with words."[1]

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CHARLES SANDISON
Between Words, 2004 (detail)
Computers and data projector
Gallery installation, dimensions variable

Until recently, single words, without sentence structure, have been the primary components of Sandison's art. Using symbolic, often dialectic words that are simple and immediately comprehensible—yes/no, good/evil, male/female, young/old—Sandison creates mesmerizing compositions that visualize the paradoxical complexities of human communication and behavior.

"Generally as an artist," Sandison comments, "what interests me exists through a relationship of physical contrasts. I use this in my computer programs. I consider contrasts to be the basic building materials in reality."[2] The installation *Good and Evil* (2002), for instance, is based on the relationship between the words "good" and "evil." Sandison programs each word—alone, duplicated or in groups—to colonize the space by eliminating the opposite word. "As the words move in opposition to each other they organize themselves into columns of attack and lines of defense,"

CHARLES SANDISON
Good and Evil, 2002 (detail)
Projected data: code, computers, projectors
Gallery installation, dimensions variable
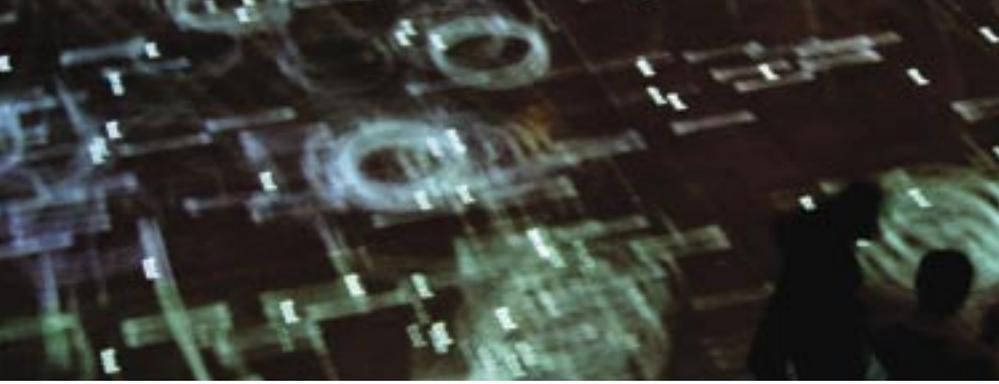
remarks Sandison," and when the words collide there is a 50/50 chance one of the words will be eliminated. There can be as many as 40,000 words moving in clusters and formations as the battles rage."[3]

This exploration of human behavior continues in *Rage Love Hope Despair* (2004), a large installation commissioned for a major arts festival in Paris.[4] For this work, Sandison programmed a computer to create what he describes as an "artificial mind" within which he released emotions or "humors" represented as text, each word following its own reprogrammed behavioral pattern. In this work "aggressive words attack passive words, positive words seek to heal negative words, with each word affected by other words prompting new patterns of action and reaction."[5] The work's intention is for the viewers to respond intellectually and emotionally to these interactions, thereby gaining insight into themselves and into the psychology of human behavior.

In *Ocean* (2001), an expansive floor is covered with words that "breed" and multiply under the feet of the viewer. The words represent elements or notions basic to most living systems: mother, father, female, male, child, old, dead, food, virus. Sandison programs the movement of these words to mimic or simulate patterns of human social behavior. (Males defend social units; females select breeding mates and produce children; males compete for females and attack other males; a child eats, grows old and dies; viruses spread and infect populations.) His installations, therefore, comprise what seem to be "moving, living and reproducing words"[6] that are programmed into both random and carefully systemized patterns of text. Much of the movement and the sequence of actions are predetermined. Chance, however, also plays a role, so that the works, in a sense, have a life of their own and can develop in unpredictable ways. One critic has noted that Sandison's text fragments obey laws similar to those of biological existence (birth, life, death) and social life (encounters, the impulse to approach or flee).[7] The artist, in fact, sees his work as being a form of artificial life that attempts to simulate human nature and behavior in a self-generating narrative.

Sandison's installations draw on a wealth of ideas from literature, philosophy, science and sociology. His latest

CHARLES SANDISON
Ocean, 2001
Projected data on floor: code, computers, projectors
Gallery installation, dimensions variable

work, *Index* (2005–6), created specifically for *All Digital*, draws on the history of knowledge. In preparing for the exhibition, Sandison envisioned this large-scale immersive installation as follows:

"The general appearance of the work will be like walking into a book. The walls of the installation will be covered with text. The room will contain the entire text of a contemporary encyclopedia, consisting of 28 volumes of textual information (around 230 MB of text). The information will continually shift and try to organize itself into 'families' related through different aspects of the text – similar word types, dates, adjectives, nouns. The overall appearance will be areas of the installation where the words are broken from their sentence structures and are moving in swarms or flocks; elsewhere there will be relatively stable 'paragraphs.' The work will have a finite existence before the process of 'reconstruction' has completed. It will take the piece around 125 years to finally settle, give or take a decade either way."[8]

Index (2005-6) presents a dynamic visualization of human knowledge (or, a fraction thereof), immersing the viewer into a visceral experience that is both mesmerizing and intellectually stimulating. How much information does the world contain?, how much human memory is there? and what is human knowledge? are just some of the questions this work raises.

Despite the underlying complexity of ideas, Sandison's installations are essentially poetic. They often evoke the flow of a river, birds in flight, drifting clouds[9] or bursts of cosmic dust that implode and then coalesce into tenuous but evocative forms in space. More importantly, the work is imbued with a pristine almost romantic sense of awe, even beauty. Sandison is an artist whose level of intellectual inquiry, compositional skill and command of new technologies results in profound, visually engaging works of art.

CHARLES SANDISON
3029 Names, 2004
Computer software, data projector
Projection on wooden box
Installation at Gallerie Bernier/Eliades, Athens

NOTES

1 Charles Sandison, in conversation with the author, August 2005.

2 Sandison, in his unpublished technical document for *Good and Evil*, 2002.

3 Ibid.

4 *Rage Love Hope Despair* was featured along with installations of 22 artists in *Zones of Influence*, an exhibition curated by Benjamin Weil at La Villette Numérique in Paris.

5 Sandison, in his unpublished technical document for *Rage Love Hope Despair*, 2003.

6 Artist's statement in *Documents,* exh. brochure (Helsinki: FRAME [Finnish Fund for Art Exchange], undated).

7 Guitemie Maldonado, "Charles Sandison Review," *Artforum* 42, no. 6. (February 2004): 158.

8 Email conversation with the author, September 19, 2005.

9 Larys Frogier, "Travelling Words," in *Charles Sandison, Between Heaven and Earth*, exh. cat. (Rennes: La Criée Centre d'Art Contemporain, 2002), up.

LYNN HERSHMAN LEESON

Since the 1970s, I have pioneered the use of interactive computer and video technology to address ideas about the social construction of female identity, the effects of mass media on society and humans' relationships to machines. I do this most often through the narrative construct of an alter ego or "agent." I have recently developed three distinct artificially intelligent bots (Ruby, DiNA and RoBota) as well as two meta bots (Tillie and CyberRoberta) and have expanded the concept of a "virtual presence" to create artificial intelligence–based agents that use Web capabilities to capture and re-pattern information streams into continuous dialogues with users. Interaction with these virtual beings, who exist as bodiless embedded brains, raises the question of how these creatures can express emotions, have distinct personalities, a growing memory and even mood swings. **This exploration delves into and extends the limits of our understanding of what constitutes "presence."**

– LYNN HERSHMAN LEESON
 SUMMER 2005

tual "agents"—personas she creates that exist on the Internet. Surveillance and voyeurism, and an exploration of the cyborg self, artificial intelligence and the increasing symbiosis between humans and machines are key concepts in her work.

A MULTIFACETED AND PRODIGIOUS ARTIST,

Lynn Hershman Leeson is internationally recognized for her interactive computer installations, performance, photography, video and film works. For the past 40 years, she has been at the forefront of artists working with "new media." One of the pioneers of new media, Hershman Leeson produced the first interactive artwork (*Lorna, 1979–82*), which was created with videodisc technology, a forerunner of the DVD. Among her numerous achievements are the first artwork to use a touch screen interface (*Deep Contact*, 1984–86) and one of the earliest telerobotic art installations (*Difference Engine #3*, 1995–99). Hershman Leeson was also the first to use virtual sets in a feature film (*Conceiving Ada*, 1996).[1]

Throughout her prolific career, Hershman Leeson has investigated the social construction of identity through the narrative construct of fictional identities or vir-

This exhibition features one of Hershman Leeson's most recent works, the interactive computer installation *DiNA* (2005–6), a fictional clone and artificially intelligent interactive "agent" whose 10 x 6 foot projected image on the gallery wall is wired to the Internet. The conceptual basis for *DiNA* dates back to 1993, and over the past 12 years the work evolved through various manifestations, including Ruby, one of three artificially intelligent self-replicating automatons in Hershman Leeson's first feature length film, *Teknolust* (1999–2002). Ruby, who in the film was created out of DNA downloaded by a biogeneticist, later evolved into *Agent Ruby* (1993–2002), a multi-platform, voice-

LYNN HERSHMAN LEESON
previous page *DiNA*, 2004–6
Networked artificial intelligent agent
Artificial intelligence mark-up language and Java code, Pulse 3D Veepers software, voice-recognition software, text-to-speech software, PC, microphone
Projection: 10 x 5 feet
this page *Conceiving Ada*, 1997 (still)
35 mm film

LYNN HERSHMAN LEESON
Teknolust, 2002 (still)
24 P High definition video converted to 35 mm film

u [11:14:10] Match: ASKQUESTION4 :*
u [11:14:10] Filename: "bots//std-profile.ai
u [11:14:10] Response 41616 in 12 ms. (Ave
u [11:14:53] > [Messages] - Added - Descrip
u [11:14:53] Match: *:*:*: Ruby

activated, sensor-driven installation wired to the Internet. This artificially intelligent being exists as an installation; viewers can "converse" with her by typing questions on a keyboard to which she responds verbally, drawing on the vast amount of information available on the Internet. *Agent Ruby* remembers questions and names, and even has moods that may be affected by Web traffic. As she assimilates information from the Internet, her capacity to accumulate and build intelligence grows, with current news and other developments in cyberspace informing her "thinking." Audiences can also download *Agent Ruby* onto Palm Pilots® and laptops, thereby extending her lifecycle into one of "continual replication and breeding." *Agent Ruby* further exists as a website, thus simultaneously straddling the real and virtual worlds as an object (an installation) in a museum, gallery or studio and as a virtual presence in cyberspace.

Agent Ruby evolved into *DiNA* (2004–5) when Hershman Leeson succeeded in integrating voice-recognition tech-nologies into this artificially intelligent being. In its past permutations, this synthetic or machine-made being was animated, so to speak, with virtual life. Now Hershman Leeson has provided *DiNA* with the ability to simulate "real" communication and conversation with viewers, in

essence, breaking through the interface separating both the real and virtual realities.

DiNA is groundbreaking in both concept and execution. Speaking about the technologies Hershman Leeson uses, Java programmer Kyle Stephan said she "pushes the envelope of what these tools were designed and meant to do."[2] A number of new media artists work with artificial intelligence; Hershman Leeson, however, is one of the first to fuse it with a "virtual persona connected to the Web."[3] With this extraordinary work, Hershman Leeson succeeds in incorporating advanced technologies to create a completely new art form, one that explores artificial intelligence and its interface with humans.

The issues *DiNA* delves into—such as the nature of human thought, information processing, artificial intel-ligence and artificial life forms—raise complex scientific and philosophical questions that have profound social, moral and cultural implications. What is at stake here is

LYNN HERSHMAN LEESON
Screen still of code for *Agent Ruby*, 2004-5

AGENT RUBY'S EDREAM PORTAL

the very nature of human identity and its rapid transformation by new technologies. The world we now live in is one in which digital, medical and biological technologies are dissolving age-old distinctions between what is alive and what is not, what is conscious and what is not, what is human and what is not, what is natural and what is unnatural. The key issue embodied in this revolutionary work of art is what it will mean to be human as we move further into the 21st century.

NOTES

1 Robin Held, *The Art and Films of Lynn Hershman Leeson* (Berkeley: University of California Press, 2005): XI.

2 Hershman Leeson worked with Colin Klingman, programmer; Kyle Stephen, project director; and Matt Heckert, fabricator, in developing *DiNA*.

3 Hershman Leeson, in conversation with the author, February 2005.

LYNN HERSHMAN LEESON
Agent Ruby, 2002 (screen still)
Artificially intelligent Web agent

JOHN F. SIMON, JR.

I write software to create and observe systems.
Software art is not like video, film or computer
animation where the image sequences are
recorded. The images displayed by my software
are created as they are viewed. Instead of dis-
playing a reproduction of a scene, software IS
the scene, which evolves and never repeats.

One of my newer software artworks, *Fountain*
(2004), is an evolving visual metaphor for the
creative process. Patterns assembling them-
selves above an ever-changing vortex of color
symbolize thoughts arising from the human mind.

Where will this pursuit of systems ultimately
take me? I believe that as computer hardware
and programming languages get more sophis-
ticated, my evolving images will become a new
kind of realism. Simulations in software will not
only resemble physical objects but will also
function like them—or create whole new kinds
of objects. **The software art of the future will be
a living system that continually evolves.**

— JOHN F. SIMON, JR.
  SUMMER 2005

ONE OF THE LEADING "CODE" OR
"SOFTWARE" ARTISTS, John F. Simon, Jr.
creates mesmerizing digital abstractions with code or
software that he writes himself. His software generates
complex, time-based imagery that evolves on wall-
mounted laptop screens or LCD panels. In addition to
producing wall-mounted artworks, Simon has developed
a number of Web-based projects and a large-scale
installation on six large plasma screens embedded in a
116 foot long mural of laser-cut Formica® panels.[1] More
recently, Simon has begun presenting his software art
as digital projections, the most recent of which, *Fountain*
(2005–6), is on view for the first time in this exhibition.

Simon's software generates the compositions in his
artworks, moving colors, shapes and forms in vibrant,
incessant patterns. Within a relatively compact, seem-
ingly regimented geometric matrix, he orchestrates
rhythm, pattern and color in an endless spectrum

of combinations that never repeat. Furthermore, the computing in these works of art is generated in real time, continually creating and recreating the images.

With four times the resolution of conventional video imagery, Simon's work has an exceptional clarity and level of definition that, when combined with the broad range of compositional variation and millions of color combinations, results in fascinating visual experiences. With these kinetic works, Simon renegotiates what painting can be in the 21st century—transforming it from a medium that renders situations, emotions or ideas at a set moment in time into one that evolves continuously through time and spatial planes.

Simon's computational prowess seems daunting; nonetheless, his works are rooted in drawing. "I draw every day," he says. "Drawing is the start of all my projects, a means of examining my thought processes."[2] He works from preparatory sketches, eventually realizing them in code. In speaking about his aesthetic influences, he remarked:

"I'm always inspired by reading Paul Klee's notebooks because his drawings look like diagrams of moving objects and unseen forces begging to be activated…

I owe a tremendous debt to the teaching and thinking of Paul Klee. His diagrammatic style and conception of the

JOHN F. SIMON, JR.
Automata Studies, 2002
Software, Apple G3 PowerBook®, acrylic plastic
19 x 16 x 3 inches

line as a result of motion was the blueprint for many of my investigations into dynamic imaging."[3]

Dynamic imaging (the fusion of image with motion) provides Simon with a creative platform to investigate systems. "My artwork explores the world through sets of interacting systems. Starting with informational, conceptual and physical systems, I negotiate social systems, computer systems, drawing systems, traffic systems, operating systems, solar systems."[4] With advanced degrees in science and art, Simon brings a wealth of knowledge from both fields to his creative process.

A signature work, *ComplexCity* (2000), reflects this fascination with systems and organizational structures while exploring "the pure abstraction of Piet Mondrian and the abstract realism of Stuart Davis."[5] Made with software, an Apple G3 PowerBook® and acrylic plastic, *ComplexCity* is a dazzling cityscape that references Mondrian's famed painting *Broadway Boogie Woogie* (1942–43). Simon's digital painting depicts abstract patterns as well as more recognizable skylines, skyscrapers

JOHN F. SIMON, JR.
this page *Endless Victory*, 2005
Software, Apple G4 PowerBook®, acrylic plastic
29 x 29 x 3 inches

facing page *Fountain*, 2004 (screen still)
Software, Apple G4 PowerBook®
Projection, 8 x 10 foot diptych (detail)

and grids mapping out streets and traffic flow. A portrait of New York City, the work is divided into several sections, such as the Manhattan skyline and a bird's-eye view of midtown Manhattan intersected by the diagonal representing Broadway. Colored squares, representing vehicles, are in constant motion, and like the changing skyline, their rhythm and patterns never repeat. Every four minutes, the work changes from day to night. A feat of software engineering, *ComplexCity* contains eight subprograms of code, all visualized as imagery, with an exponentially large number of ways to combine and recombine the elements of the picture.

Much of Simon's work is based in theoretical writings. *Automata Studies* (2002), for example, references essays by seminal thinkers who discuss some of the early goals of computer science, including the ways that varying processes may lead to "intelligence."[6] Other works, such as *Color Panel v 1.5* (2001), are color studies, albeit time-based, in which the artist explores Bauhaus color theories put forth by artists such as Paul Klee, Wassily Kandinsky and Joseph Albers.

Parallels between Simon's work and that of earlier conceptual artists such as Sol LeWitt, Lawrence Weiner and Joseph Kosuth can also be seen. LeWitt's wall works are systematically determined by sets of instructions. Likewise, Simon's art is also systematically determined,

but in his case by sets of instructions or algorithms (code) that he creates and sets in motion. *Every Icon* (1996), one of the artist's early conceptual art works, most readily demonstrates this. This piece of software art, presented as a work of art on the Web, as a Palm Pilot© application or as an art object on the wall, consists of a 32 x 32 pixel grid in which each square can be colored black or white. The piece starts with every square white and is programmed to progress through every possible combination of black and white until every square is black. If the program processes 100 changes per second, the artist has computed that it takes 1.36 years to display all the variations possible on the first line. At this rate, the artist estimates that it will take an exponential 5.85 billion years to complete all possible variations on the second line. Simon's rigorously analytical work sets forth instructions that result in concepts that challenge our ability to comprehend them. In responding to the vast (and expanding) capacities of the computer, Simon's

JOHN F. SIMON, JR.
CPU, 1999
Software, Apple PowerBooks®, acrylic plastic
14½ x 10½ x 3½ inches each
Four sculptures from the 1999 installation at Sandra Gering Gallery, New York[7]

work "plays out on a scale of time that exceeds even our imagination."[8] In presenting what approaches the unfathomable, or what comes close to visualizing infinity, Simon creates objects of art that are intriguing and beautiful. His work exemplifies a masterful fusion of technology, intellectual rigor and aesthetics.

NOTES

1 *Every Icon*, one of the first works of art distributed on the Web, was created in 1996. The large-scale installation *Channels* (2002) was commissioned by the University of Iowa, Iowa City, for its Medical Education and Biomedical Research Facility.

2 John F. Simon, Jr., in his unpublished Video Sampler, 2004.

3 See Simon's artist statement on his website, www.numeral.com.

4 Simon, from his artist statement of September 2005.

5 See Simon's description of works on his website, www.numeral.com.

6 The title originates from John McCarthy and Claude Shannon, eds., *Automata Studies* (Princeton: Princeton University Press, 1956). This text includes essays by Claude Shannon, John von Neumann and Marvin Minsky that discuss some of the early goals of computer science, including the ways that varying processes may lead to "intelligence."

7 CPU: Central Processing Unit – the part of a computer (a micro-processor chip) that does most of the data processing; the CPU and the memory form the central part of a computer.

8 *2000 Whitney Biennial*, exh. cat. (New York: Whitney Museum of American Art, 2000), 194.

CHRISTA SOMMERER and LAURENT MIGNONNEAU

We are artists working since 1991 on the design of interfaces and the creation of interactive computer installations—**installations that constantly change, evolve and develop over time through user interaction.** For several of our interactive systems, we have applied artificial-life and complex-systems principles and used genetic programming to create open-ended systems.

LifeWriter, the work commissioned for *All Digital,* uses an interface consisting of an old-style typewriter that evokes the era of analogue text processing. The typewriter interface also contains a special light sensitive screen; when users type out text, letters transform into corresponding artificial life creatures, appearing to float on the screen as if they emerged from the typewriter itself. **Connecting the act of typing to the act of creation of life is a further step in the development of emergent systems and life-like art that merges the boundaries between real and virtual.**

— CHRISTA SOMMERER AND LAURENT MIGNONNEAU
   SUMMER 2005
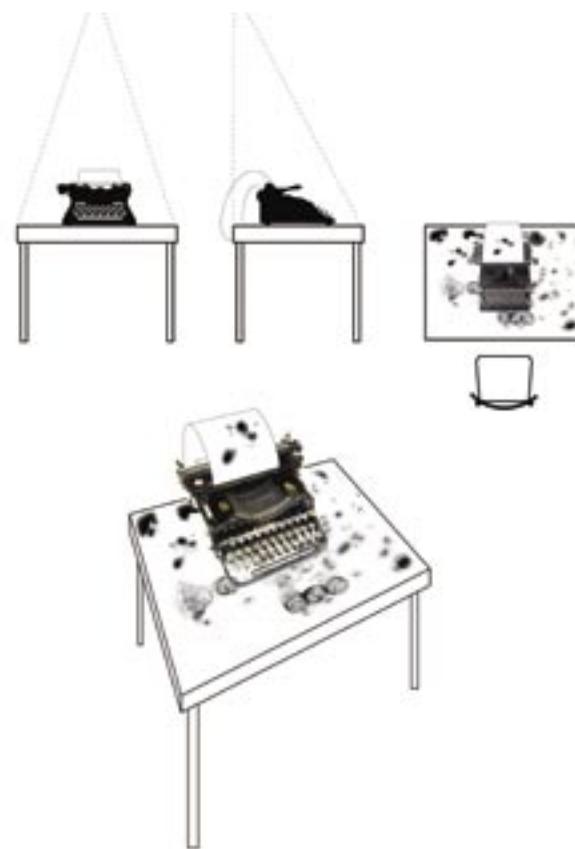
CHRISTA SOMMERER AND LAURENT MIGNONNEAU ARE INTERNATIONALLY RENOWNED ARTISTS WORKING AS A TEAM in the field of interactive computer installation. Their collaboration, which began in 1992 at the Institute for New Media at the Städelschule in Frankfurt, has been influenced by the combination of their different fields of interest, including art, biology, performance, music, computer graphics and communication. Sommerer originally studied biology (botany), modern sculpture and art. Mignonneau's original studies were in video and design.

Sommerer and Mignonneau's interest in evolutionary biology led them to investigate how simulating the processes of nature through computer programming might be incorporated in their artistic endeavors.[1] This research led them to create interactive artworks that have been called "epoch making"[2] for their application of artificial life and generative systems to their interface designs.

Among Sommerer and Mignonneau's earlier interactive computer installations is *A-Volve* (1994). Developed

CHRISTA SOMMERER and LAURENT MIGNONNEAU
previous page *LifeWriter*, 2006 (sketch)
Interactive computer installation

this page *TransPlant*, 1995
Interactive computer installation

All dimensions variable

with Dr. Thomas S. Ray, one of the pioneers of artificial life, *A-Volve* is an interactive computer installation in which virtual interactive "creatures" live in a water-filled glass pool where they mate, reproduce, compete and evolve. Viewers create artificial creatures by touching the glass interface: by drawing on the touch screen with their fingers, viewers design and "give birth" to virtual three-dimensional "creatures" that are "alive" and swim in the real water of the pool.[3] In this work of art, human beings and virtual creatures interact as the creatures react to the viewers' hand movements—if a viewer tries to catch a creature, it will try to flee. The creatures' actions or behavior are not predetermined but develop in real time. *A-Volve* was the first interactive work where viewers could actually create artificial life, watch it evolve and interact with it.[4]

This concept was advanced in *TransPlant* (1995), an installation in which humans interact with virtual plants. Upon entering the installation space, viewers see them-

CHRISTA SOMMERER and LAURENT MIGNONNEAU
A-Volve, 1994
Interactive computer installation

selves projected on a screen and become part of a simu-lated jungle, surrounded by images of plants. The plants grow in response to the movements of the viewers who thus create their own environment in cyberspace.[5]

Another interactive computer installation, *LifeSpacies II* (1999), is an artificial life environment where on-site and remote visitors interact with one another to create artificial creatures via a text-to-form coding system. In this work, visitors on site input text into a computer which is then programmed to function like genetic code and translates into visual creatures that start "to live," move around, duplicate and eventually dissipate. Remote visitors, from anywhere in the world, can also interact with the system by simply typing and sending an email message to the *LifeSpacies II* website (www.ntticc.co.jp/ ~lifespacies). Sommerer and Mignonneau created a more advanced and very different version of *LifeSpacies II* for

CHRISTA SOMMERER and LAURENT MIGNONNEAU
LifeSpacies II, 1999 (screen still, detail)
Interactive computer installation

All Digital. Commissioned for the exhibition, this work is titled *LifeWriter* (2006) and represents their latest and most advanced creative effort to date.

LifeWriter consists of an old-fashioned typewriter that stands on a projection-screen table. The typewriter serves as an interactive interface. When users type on this typewriter, the text transforms into artificial life forms that appear quite organic, like bacteria or micro-organisms, and yet abstract at the same time. Appearing on a special paper, these forms also spill over to the table—metabolizing, reproducing, transforming and eventually dying. "The whole process is one of writing text that becomes "alive," remark the artists. "It is designed to be very seamless, connecting the real with the virtual space."[7]

LifeWriter is an unusual project, not only in the applica-tion of new technologies to sculpture, but as an example of a totally new art form, one in which art becomes fused with artificial life forms and begins to evolve toward a "living" art form. Of significance, too, is the concept put forth in this work of humans participating with machines in the act of creating "life" or "alternative life forms." Sommerer and Mignonneau's creation and manipulation of visual images in an interactive digital environment

where participants also engage in the act of creation raises fundamental questions about human interaction with increasingly "intelligent" machines and possible levels of human-machine symbiosis.[8]

NOTES

1 Christa Sommerer and Laurent Mignonneau, "Art as a Living System," in Sommerer and Mignonneau, eds., *Art@Science* (Vienna, New York: Springer-Verlag, 1998), 150.

2 Toshiharu Itoh, NTT InterCommunication Center in Tokyo.

3 Sommerer and Mignonneau, "Art as a Living System," 152.

4 Sommerer and Mignonneau, "Introduction: Art and Science—a Model of a New Dynamic Interrelation," in *Art@Science,* 18.

5 See the artists' concept description for *TransPlant* at www.iamas.ac.jp/~christa/.

6 Originally developed for the NTT-ICC InterCommunication Museum in Tokyo as part of the museum's permanent collection.

7 Sommerer, in email correspondence with the author, February 15, 2005.

8 See Christiane Paul, *Digital Art* (London, New York: Thames & Hudson, 2003), 153.

PAUL CHAN

OVER THE PAST SEVERAL YEARS, Paul Chan has received widespread recognition for his remarkable work in digital animation. Using a variety of computer graphics programs, he creates narratives characterized by vibrant color, stylized cartoon-based imagery and wildly fantastic scenarios that draw on a myriad of sources from art, history, social theory and popular culture. *My Birds…Trash…The Future* (2004), for example, has an unusually broad range of references which include Samuel Beckett, the Bible, filmmaker Pier Paolo Pasolini and rapper Christopher Wallace, a.k.a. Biggie Smalls.

On view in this exhibition, *Happiness (finally) after 35,000 Years of Civilization—after Henry Darger and Charles Fourier* (2000–2003), is a two-channel, 17-minute animated digital video installation. It presents an "epic" allegory, an alternately idyllic, violent and visionary world based on Chan's reinterpretation of the drawings of artist Henry Darger and the writings of utopian socialist Charles Fourier.

The reclusive, self-taught American artist Henry Darger (1872–1972) created an epic narrative about a beautiful and violent fantasy world inhabited by pre-adolescent girls who fight against and, ultimately, prevail over sadistic adults.[1] The social theorist Charles Fourier (1772–1837) envisioned a world based on a cooperative organization of labor and a more equitable distribution of wealth. Fourier's vision of utopia was also predicated on the hedonistic belief that all physical passions should be indulged.[2]

In *Happiness (finally) after 35,000 Years of Civilization*, Chan builds upon Darger's visionary world, infusing it with Fourier's hedonistic social philosophies to recreate a fantastical landscape of his own. The installation depicts bucolic landscapes of flower-filled meadows and forests, clear blue skies with huge rolling white clouds and star-studded night skies. In this utopian world, a community of prepubescent girls lives in harmony, laughing, frolicking, running to and fro and playfully yielding to every conceivable physical desire. With innocent, uninhibited abandon they indulge in all things sensual from having sex to eating flowers, feasting and defecating. But suddenly their world erupts into violence as men in suits followed by men in army uniforms invade. An epic battle ensues. The girls are tortured, maimed, killed and, as suddenly and inexplicably as the invasion began, they wipe out their oppressors and are victorious.

opposite PAUL CHAN
Happiness (finally) after 35,000 Years of Civilization—after Henry Darger and Charles Fourier, 2000–2003 (screen still, detail)

The screen reverts to the idyllic pastoral scene. It is an astounding tale—enigmatic, absurd and horrific—in which visions of utopia and apocalypse collide.

Happiness (finally) after 35,000 Years of Civilization combines a brilliant use of color and composition reminiscent of Darger's work with imagery based on cartoons and video games. What distinguishes Chan's work, however, is the breadth of sources for imagery that draws not only on Darger, but on the work of Diane Arbus, Hans Bellmer, Pieter Bruegel, Japanese pornography, the "Book of Revelations" in the Bible and the philosophical and literary writings of Jacques Derrida, Georges Bataille and John Ashbury, among others.[3] Images from historical and political events also enter into Chan's lexicon of images and symbols. Appropriating freely, he distills this rich amalgam of sources into simplified, stylized images that, while digitally generated, have a crude, hand-drawn quality that resembles not only a cartoon aesthetic but also aspects of folk art or "faux primitive" art traditions. This technique renders his art "weirdly removed from our time even though it reflects upon it."[4] Like protagonists in video games, Chan's characters act without any semblance of emotion or recognition of the moral consequences of their actions. While the world portrayed in *Happiness (finally) after 35,000 Years of Civilization*

may seem remote and surreal, its level of indifference and seeming immunity to violence provides an eerie commentary on contemporary culture.

Happiness (finally) after 35,000 Years of Civilization is projected on both sides of an elongated horizontal screen suspended more than three feet off the floor in the middle of the gallery. To experience the work in its entirety, viewers must walk from one side of the suspended screen to the other. The evocative sound track of birds singing, laughter, gusts of winds or the din of war further extends the work's physical presence in the gallery. Thus, Chan transforms a customarily two-dimensional medium—animation projected on a screen—into a three-dimensional sculptural object. The presentation of the work on a split screen front and back makes it impossible to absorb the entire piece at once. Truncating the experience in this way parallels the dichotomies, or perhaps, the conflation of dualities, inherent in the piece—pain and pleasure, beauty and horror, utopia and apocalypse. However, this juxtaposition of utopia with the reality of human brutality and violence is completely ambiguous. Striving to create a utopian world that embraces human contradictions demonstrates hope and ultimately faith in humanity. And certainly the title, *Happiness (finally) after 35,000 Years of Civilization* implies

that utopia is at hand. Nonetheless, the ending, reverting as it does to the beginning of the tale, suggests that either utopia has been attained or that the saga will repeat itself, a grand and futile exercise. Ambiguity aside, in the end it is the collision of fantasy and reality in this implausible yet beguiling narrative that is so compelling. As Chan himself muses, "I think reality is overrated. Fantasizing and escaping is a kind of self-cure we administer to ourselves, a tool for self-preservation in the face of the things we cannot bear."[5]

NOTES

1 See Paul Chan's website and the Darger page at
   www.nationalphilistine.com and www.saraayers.com

2 See Selected Notes and Research 1999–2003
   at www.nationalphilistine.com

3 A lexicon of these sources appears on Chan's website at the
   Notes and Research section of www.nationalphilistine.com

4 Joanna Bruton, "Paul Chan," *Artforum* 91, no. 1 (January
   2005): 106.

5 Nell McClister, "Paul Chan," *Bomb* 92, (Summer 2005): 22–30.

PAUL CHAN
*Happiness (finally) after 35,000 Years of Civilization—after Henry Darger
and Charles Fourier*, 2000–2003 (screen still)

LEO VILLAREAL

The light sculptures I create employ systems that combine different elements into a complex whole. I use grids and geometry to create ordered frameworks within which points of light are sequenced in patterns that accelerate, decelerate, collide, multiply, explode, live and die. Through my own custom software, **I explore particle systems and cellular automata, playing with individual elements and the parameters that govern them to produce lush temporal abstractions.** The work alternates between the slow internal rhythms of the body and the frenetic speed of urban life, eluding easy decoding as numerical emanations vacillate between signal and noise.

– LEO VILLAREAL
   SUMMER 2005

LEO VILLAREAL
Chasing Rainbows, 2004
Wall mounted light sculptures
LED lights, tubes, custom circuitry, hardware
60 x 96 x 4 inches each

LIGHT, COLOR AND MOTION are principal elements in Leo Villareal's work. His "digital light sculptures,"[1] as they have been described, are created by programming computers to produce sequences of light patterns using thousands of light emitting diode (LED) lights. Encased in translucent Plexiglas® boxes or plastic tubes stacked together and mounted on the wall, the LEDs are individually modulated to produce muted, hypnotic fields of expansive color, constantly moving patterns or pulsing flashes of light. The dizzying array of hues and patterns range from what might be perceived as coded games to hypnotic or techno "lounge" atmospherics or "elaborate optical toccatas."[2] The results are mesmerizing. Villareal's light abstractions are shimmering and luminous, fleeting and evanescent.

The minimalist artist Dan Flavin pioneered the use of light to create sculpture in the 1960s with his fluorescent tube compositions and since then a number of artists

have used light as a primary medium for their art. Bruce Nauman's conceptual neon works, James Turrell's atmospheric environments, Brian Eno's sound and light sculpture and, more recently, Jim Hodges' light bulb paintings or Erwin Redl's large-scale light installations come to mind.[3] With technological advances in computer programming and LEDs, Villareal's experiments with light encompass an exponentially expanded color palette and broader possibilities in shape and form as well as motion. Movement—in the form of darting shapes; alternately slow and rapid transformations of one color into another; or the staccato of pulsing points of light—is central to his work.

Villareal's wall sculptures, or kinetic light "paintings," vary widely in scale and format. Some, such as *Devil's Playground* (2005), measuring 25 x 25 x 4 inches, are small. Others function as room installations that infuse the architectural space with fluidly changing combinations of colored light. For example, *Chasing Rainbows* (2004) comprises three large-scale wall sculptures constructed with 60 glowing tubes of light arranged horizontally in groups of 20. Villareal has also created a number of site-specific commissions, of which *Supercluster* (2003) is monumental in scale. For this piece, he installed a 45 x 120 foot grid of 640 sequenced

LEO VILLAREAL
Devil's Playground (White), 2005
LEDs, custom circuitry, microcontroller, aluminum
24 x 24 x 4 inches each
Edition of 3

LED clusters to create a stunning wall of light that covered the facade of P.S.1 Contemporary Art Center/ MoMA in Long Island City, New York. In another manifestation of his work, Villareal has experimented with synesthesia, exploring the relationship between image and sound. In addition to incorporating sound scores with some of his light sculptures,[4] he has designed light shows for the technomusician Moby and collaborated with the EOS Orchestra in New York and Red (an orchestra) in Cleveland to create an interactive video projection with computer-generated graphics that reinterprets Schubert's Symphony No. 9.

Instances (2005), created for *All Digital*, consists of three 24 x 24 x 3 inch "light sculptures," each with a flat Plexiglas® surface beneath which a matrix of LED lights is contained. Programmed according to sets of rules or algorithms established by Villareal, the white LED lights generate pulses of light that appear to flash across the surface in constantly moving patterns. While the software programming is basic, says Villareal, it was inspired by the mathematician John Conway's *Game of Life*.[5] Conway's game, based on the concept of cellular automata, operates in a system in which a set of rules is applied to individual units or cells and their neighbors within a grid. Villareal's software uses its own sets of rules within a comparable matrix to produce what appear
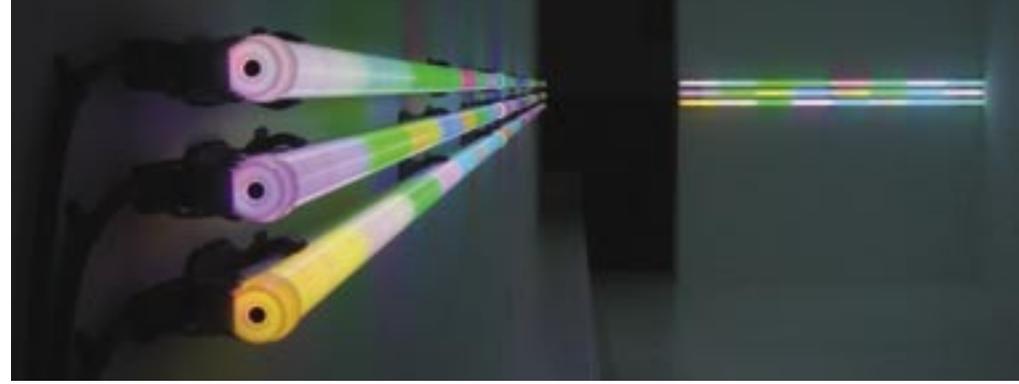
to be generative patterns. Points of light float, begin to swirl. Resembling particles or atoms, specks of light multiply and expand, becoming increasingly dense and more complex, interacting with one another in a rapidly evolving system. The effect is dazzling, one of fireflies swarming in the night sky or star clouds coalescing in space. The work suggests the process of creation, albeit a mechanical, artificial or virtual one. It also can evoke "an elusive struggle between chaos and order."[6] Villareal envisions the three panels that comprise *Instances* as "portals," offering three different ways to see into a digitally generated world. He also cites physics, specifically the ideas of Isaac Newton, as sources for his thinking in developing this piece.[7] In transforming digital technologies into luminous works of art, Villareal simultaneously alludes to scientific principles and infuses his light sculptures with poetic and philosophical undertones. This is fertile terrain where art, science and technology meet.

LEO VILLAREAL
Horizon 24, 2004
LED tubes, custom circuitry, microcontroller, aluminum
288 x 12 inches

NOTES

1 Sarah Tanguy, "Leo Villareal, Conner Contemporary Art," *Sculpture* 22, no. 6 (July/August 2003): 67–68.

2 Anjali Gupta, "San Antonio, Texas," *ArtPapers* 27, no. 6 (November/December 2003): 67–68.

3 Projected light as an art form has a rich history beginning in the early 20th century. See Kerry Brougher et al., *Visual Music: Synesthesia in Art and Music Since 1900*, exh. cat. (Washington, DC, Los Angeles, New York: Hirshhorn Museum and Sculpture Garden, Los Angeles Museum of Contemporary Art, Thames & Hudson, 2005).

4 For example, ambient soundtracks by James Healy and Jhno accompany Villareal's *Strobe Matrix* (2002).

5 Villareal, telephone conversation with the author, September 18, 2005.

6 Tanguy, "Leo Villareal, Conner Contemporary Art," *Sculpture* 22, no. 6 (July/August 2003): 67–68.

7 Villareal, telephone conversation with the author, September 18, 2005.

Computer gaming is a popular, highly addictive leisure time activity that increasingly structures our perceptual and interpretive frameworks. We have come to inhabit game reality instead of virtual reality.

As culture hackers, artists can play an important role in shaping the emerging game spaces we will inhabit. Feminist, conceptual and net artists from outside the arena of gaming culture can apply their strategies of cultural criticism and "hacktivism" to the game-patch arena.

As a popular art form historically linked to computer hacking, game modding is enmeshed in the current open source movement: nonhierarchical and omni-directional, with open knowledge access and nonguided, emergent, evolutionary properties. Game mod artists infiltrate the source code of games to create mods that they distribute to other game mod artists. In **blurring the distinctions between cultural producer/cultural consumer, reader/ writer, artist/viewer, game fan/game developer and programmer/hacker**, game modders promise (and deliver) the "many to many" cultural production that proponents of public access cable television envisioned in the 1960s.

– ANNE-MARIE SCHLEINER
  SUMMER 2005

ANNE-MARIE SCHLEINER

OUT: Operation Urban Terrain : a live action wireless gaming urban intervention.
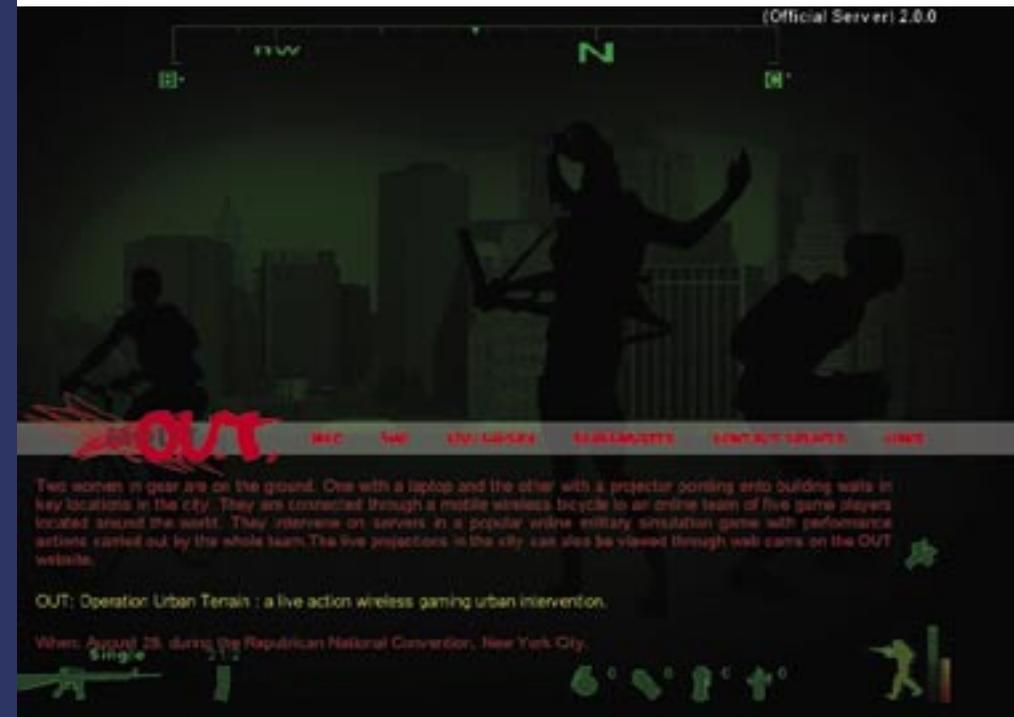
A SIGNIFICANT ASPECT OF THE DIGITAL REVOLUTION, with its widespread use of computers and digital technologies, has been the explosive growth of computer and video games.

The computer and video games business has rapidly grown into a $7.3-billion-a-year global industry and has become ubiquitous in homes, arcades, student dorms, on laptops, surreptitiously in offices and now, even on BlackBerries™ and cell phones. While it has been generally assumed that computer and video gaming is primarily an adolescent activity, recent studies indicate that game participants have become more diversified. According to one recent study, the average game player's age stands at 30, even though gaming has become an important aspect of teen life, with many spending up to three hours a day immersed in this activity.[1]

Given such widespread use, and the fact that gaming is now a larger industry than filmmaking, the impact of gaming on society and culture is difficult to measure. What is certain, however, is that gaming has changed how millions of people spend their time. Gamers spend an average of 7.6 hours to 30 hours a week engaged with any number of games such as *Super Mario Brothers*® and *Myst*® to extremely violent multiuser domain (MUD) online games such as *Doom*™ and *Quake*™. Most of

these are action-adventure style games and violent "shooters," but a variant of MUDs called MOOs are virtual environments in which players create characters, design and guide their social interactions, and essentially build virtual worlds for their characters. The popular *Sims*™ game is one such example. Other games that have become increasingly popular and prominent are "massively multiplayer online role-playing games" (MMORPGs). These collaborative and participatory Internet games, such as *Ultima Online*™, involve thousands of players from around the world interacting simultaneously. Another MMORPG, *EverQuest*™—a fantasy online role-playing game filled with monsters, humans, complex economies and social politics—has more than 300,000 players worldwide.

With the attraction of cutting-edge three-dimensional digital design, dramatic action-packed narratives and, above all, interactivity, computer gaming has provided an inviting field for artistic practice. Anne-Marie Schleiner,

previous page ANNE-MARIE SCHLEINER
OUT: Operation Urban Terrain: a live action wireless gaming urban intervention
An artistic intervention in the public space of online games and New York City streets.
(screen still)

ANNE-MARIE SCHLEINER
Corridos, 2005
3D computer game (screen stills)

Natalie Bookchin, Cory Archangel and Feng Mengbo are among a large number of artists who have adapted computer and video game structures and themes in their work.[2] A computer game programmer, writer and Internet curator, Schleiner also represents a rapidly evolving new type of "hybrid" artist in the 21st century—artists now variously identified as designers, engineers or digital media practitioners.

A self-described "cyberfeminist," and game modifier, Schleiner creates alternatives to mainstream computer and video games by producing her own as well as modifying existing games. *Velvet Strike* (2002), for example, conceived at the beginning of the Bush administration's war on terrorism, is a modification (and critique) of the popular Internet shooter game *Counter-Strike*™. Schleiner reengineered this violent, multiplayer combat game so that, instead of employing "real" ammunition, characters use spray paint conveying antiwar and antiviolence messages. In addition to taking a political stance in many of her works, Schleiner also probes gender construction in the virtual environment by inserting female heroines into what have been traditionally male arenas of gaming. *OUT* or *Operation Urban Terrain*

ANNE-MARIE SCHLEINER
PS2 Diaries, 2005
DVD Machinima Video (screen still)

(2004) is "a live action wireless gaming urban intervention" in which a team of two local women gamers connect with a team of players worldwide to intervene on servers of a popular online military simulation game. Performance actions carried out by the team were projected on walls in New York and simultaneously webcast on the *OUT* website. This antiwar game performance, which took place during the 2004 Republican National Convention, was a criticism of the increasing militarization of civilian life in the United States since 9/11.

While *Velvet Strike* and *OUT* have political and moral undertones, *PS2 Diaries* (2004), on view in *All Digital*, represents a more personal exploration. Displayed on a large LCD screen, the artist describes this 11-minute DVD as a "therapeutic trip down memory lane," exploring her early years growing up with the popular video game the *Sims*™. Schleiner made *PS2 Diaries* out of six different PS2 (Playstation 2) games—the *Sims*™, *Final Fantasy*®, *SSXTricky*™, *Crouching Tiger, Hidden Dragon*™ and *Grand Theft Auto*™—which she recreated by variously altering

ANNE-MARIE SCHLEINER
PS2 Diaries, 2005
DVD Machinima Video (screen still)

and inventing her own characters or inserting new narrative. In referencing, appropriating, infiltrating and modifying existing game structures, Schleiner partici- pates in "hacker" art, actively intervening in the virtual game world while simultaneously investigating its effects on wider cultural mores.

NOTES

1 See "Facts and Research," Entertainment Software Association website, www.theesa.com.

2 For an overview of artists working with computer gaming, see Rachel Green, *Internet Art* (London, New York: Thames & Hudson, 2004), 144–51. See also Laura Steward Heon, *Game Show*, exh. cat. (North Adams, Massachusetts: MASS MoCA, 2001).
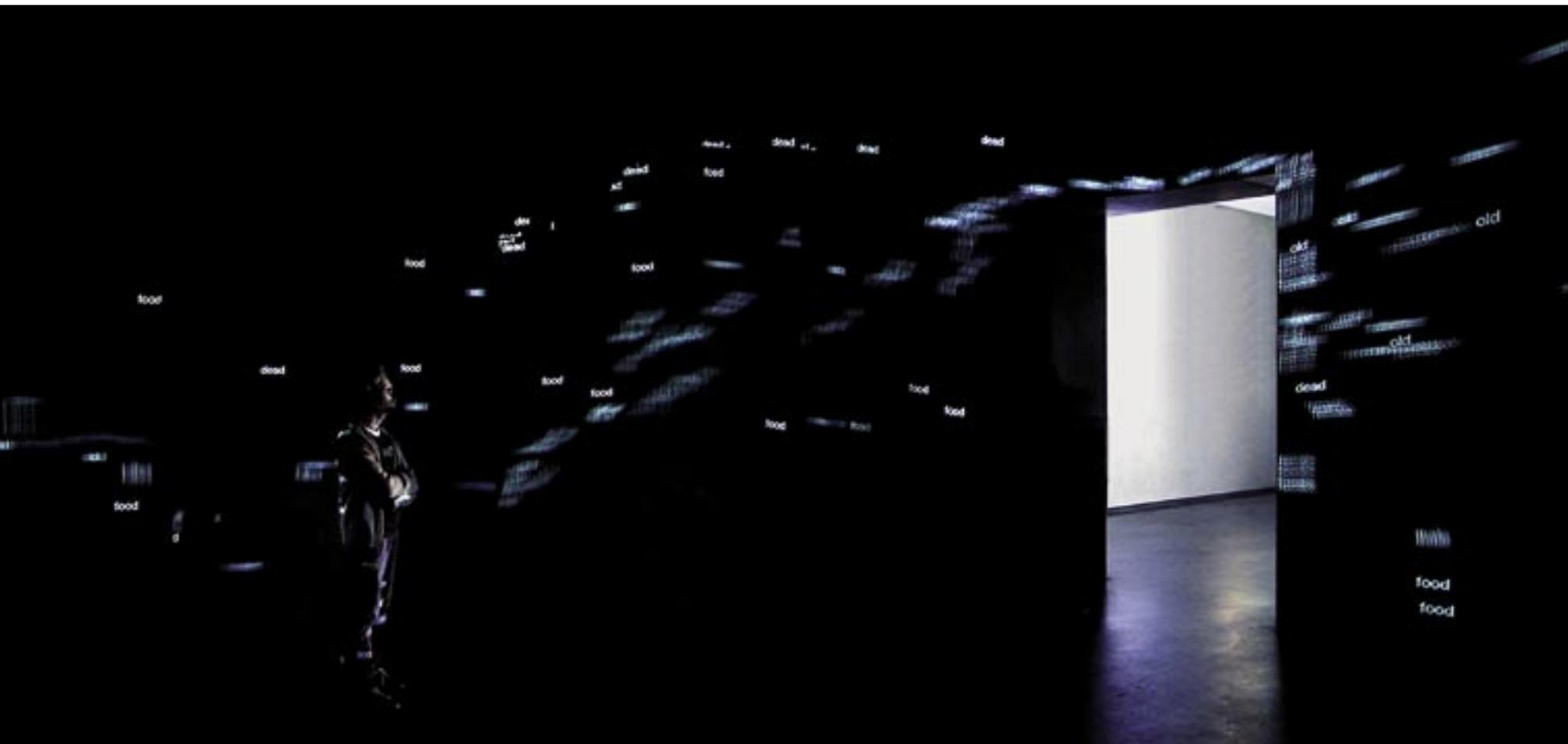
CHARLES SANDISON
Living Rooms, 2001
Projected data: code, computers, projectors
Gallery installation, dimensions variable

STEVE DIETZ is Director of the ISEA2006 Symposium/ ZeroOne San Jose: A Global Festival of Art on the Edge, a new biennial festival of art and technology that will take place in San Jose, California, in August 2006. A prominent scholar and curator in the field of digital art, Dietz was formerly Curator of New Media at the Walker Art Center, Minneapolis.

CHRISTIANE PAUL is Adjunct Curator of New Media Arts at the Whitney Museum of American Art and Director of Intelligent Agent, a service organization dedicated to digital art. She has curated numerous exhibitions, written extensively on new media arts, and has lectured around the world on art and technology. Her most current book is *Digital Art* (Thames & Hudson, 2003).

BENJAMIN WEIL is the Adjunct New Media Curator at the San Francisco Museum of Modern Art, where he recently organized exhibitions of artists such as Pipilotti Rist, Gary Hill and Jeremy Blake. In the fall of 2004, he curated *Zones of Confluence*, an exhibition that was part of La Villette Numérique, the Paris Biennial New Media Festival.

MARGO A. CRUTCHFIELD is Senior Curator at the Museum of Contemporary Art Cleveland. She has curated numerous contemporary art exhibitions at MOCA Cleveland and at the Virginia Museum of Fine Arts where she was Associate Curator of 20th Century Art and the artistic director and producer of the Virginia Museum's nationally acclaimed *Fast/Forward* performance series. Prior to that she was Assistant Curator and Interim Director at the Aspen Art Museum.

CYBER / DISCUSSION

This discussion among new media curators Steve Dietz, Christiane Paul and Benjamin Weil took place in cyberspace during October 2005 with Margo A. Crutchfield as moderator.

Benjamin Weil A point of departure for this discussion, I think, is to address the question: how does one delineate the field of "new media" in this age of ubiquitous computing when technology is used by an ever-growing number of artists?

Christiane Paul New media art is a continuously evolving field and the development of unambiguous taxonomies for the art form has been an elusive goal. The fact that new media art successfully evades definitions is one of its greatest assets and attractions, but at times the art seems more alive than its practitioners want it to be.

One of the basic distinctions one needs to make is the use of digital technologies as a tool—for example, for the production of a print, photograph, painting or

sculpture—as opposed to a medium, making use of and exploring the medium's inherent characteristics. The formal characteristics (and aesthetics) of works that use the technologies as a tool or medium, respectively, tend to be quite different. A lowest common denominator for defining art that uses the technologies as a medium is its computability, the fact that it is computational and based on algorithms. Other descriptive adjectives commonly used for characterizing new media art are process-oriented, time-based, dynamic and real-time; participatory, collaborative and performative; modular, variable, generative and customizable.

The time-based and dynamic nature of new media projects is obviously not medium-specific but applies equally to many video works or performances. However, this quality becomes fundamentally different from that of film/video when paired with the inherently nonlinear qualities of the digital medium. At any given point in time, the viewer might only see one possible configuration of an essentially nonlinear project. New media works tend to be more context-dependent than many other art forms since they require information about which data (in the broadest sense) is being shown, where it is coming from and according to which logic it is configured.

Steve Dietz I agree with Christiane, but I would also point out, for instance, that Mike Figgis' *Time Code*,[1] a film, is also arguably nonlinear as are many nondigital projects such as the Oulipo writers.[2]

In the show I most recently co-curated with Sarah Cook, *The Art Formerly Known As New Media* (Walter Phillips Gallery, 2005), I argue that "much so-called contemporary art practice, even art practice that does not self-identify—or more likely actively shuns the label new media—is exhibiting the distinctive characteristics of new media," which Christiane refers to above and expands on in her excellent survey, *Digital Art*. I think it's important to understand these distinctive characteristics, but I'm not so sure it's important to "delineate the field," as you ask.

CP I very much agree. New media art simply is part of contemporary artistic practice/discourse and the field of art in general; it is in no way helpful to "ghettoize" it as a separate entity. However, as Steve says, it is important to delineate the inherent features of the medium, which at this point still seem to be less understood than those of painting or sculpture. Ghettoizing new media would also mean disconnecting it from the history of other art forms that have profoundly informed new media practice. As Steve points out, there have been and continue to be

many artistic experiments with nonlinearity in visual arts and literature, for example. The difference being that digital technologies allow for a form of nonlinearity that is constructed "on the fly" from media elements, as opposed to the one in a film such as *Time Code*, which will play as the same film from beginning to end in every screening.

SD Except for the screening at ISEA2006 in San Jose in August 2006, when Mike Figgis will be on hand to construct a version of *Time Code* on the fly, in real time. ;-)

BW For a long period of time (late 60s to late 80s, at least) what is now usually known as "media arts" was known as "film and video." I'd be inclined to think that the reason the shift occurred is that the tools used to make this kind of work are less important to delineate a field than the way the work produced reflects and comments upon a realm of increased mediation. In that sense, maybe one could talk about new media arts as forms and thoughts that are more specifically reflecting upon the effects of ubiquitous computing in our experience—perception and understanding of the world we live in. Visible and less visible layers of technology have profoundly modified our sense of space, time, our relationship to others, our sense of security, our understanding of intelligence, and so on.

To a certain extent, this kind of work ought to be developed with the same latest technology that has permeated our daily lives, in order to be more efficient in its purpose. It is important, however, that it does so without succumbing to the ease of techno fetishism, which is of course not that interesting.

Historically, I believe it has been very hard for "new media" artists to establish a research and a career in the field of visual arts, because it was precisely deemed as technological. That issue was the same problem faced by artists who used film and video in a critical and different way. As technology becomes more and more part of everyone's daily life, the fact some work is produced with technology will be less and less of a concern.

What seems interesting is that a lot of artists who worked with technology have embraced other media and become well versed in many various forms, erasing the boundaries between "traditional" visual art and newer forms they had pioneered. I think of artists like Yael Kanarek, for instance.[3]

In that same vein of ideas, what may also be interesting with technology is that we probably see the resurgence of the notion of craftsmanship. All artists working with technology and establishing a discourse about technology have to maintain a certain mastery of the tools

In many new media works, the "art object" has been dematerialized to network processes. In other cases, the object has become "distributed"— there may be an object in a gallery space but it becomes debatable what the "site" of the project is if it is shaped by and kept alive through contributions over the network.

they use, something that was not necessarily true of work that is more "conceptual" and, hence, less prone to be technology driven. More likely than not, this kind of work is produced with assistance from professionals.

Margo A. Crutchfield This return to craftsmanship, mastery of tools and collaboration with professionals (computer experts, engineers or scientists) is an important point, particularly since this development marks a transition in the makeup and role of many artists and, to some extent, a realignment of art and science. Speaking of transitions, what do you see as the most radical ways in which digital technology is changing art as we have known it?

CP Digital technologies have changed both the nature and the "site" of the art object and the agency of the viewer, which I consider fundamental changes. In many new media works, the "art object" has been dematerialized to network processes. In other cases, the object has

become "distributed"— there may be an object in a gallery space but it becomes debatable what the "site" of the project is if it is shaped by and kept alive through contributions over the network. At the core of digital media—from the macrocosm of cultural practice to the microcosm of an individual artwork—are the (immaterial) links between materialities. Probably more than any other medium for art, the digital is embedded in various layers of commercial systems and technological industry that continuously define standards for the materialities of any kind of hardware components. At the same time, the immaterial systems supported by the digital medium and its network capabilities have opened up new spaces for cultural production and DIY culture. Many projects—particularly social or activist software, so-called artware—exist in the digital commons as a space of shared information resources collectively owned by a more or less well defined community. As art activist/theorist Geert Lovink has pointed out,

these projects inhabit a "third space" between state interests, institutions and market forces.[4] As activist art projects, these works are "living processes" that exist outside of any institutional framework. Within a gallery or exhibition, they can only be reduced to a form of documentation if the gallery is transformed into a local "community center" that is open to and supportive of ongoing engagement.

Digital technologies have definitely supported a new form of visual culture that often finds itself at odds with institutional structures in various ways. New media arts also raise fundamental questions about the museum's role as an archive and "cultural memory." How do institutions present and archive visual culture and artistic practice that is shaped by real-time processing and entails an instant remix, production, distribution and reception unfolding outside the museum space itself?

SD In 1978, Alain Minc and Simon Nora, two French social scientists, wrote a study that was published in English titled *The Computerization of Society*. In it they coined the term *telematique*, meaning the conjunction of telecommunications (the network) and *informatique* (the computers). They argued that this conjunction would change the world. And I think it's inarguable that it has. Including, if not the mainstream art world, then, art practice.

Technology has definitely forced a reassessment of what is a work of art.

Some of the changes in art practice are exactly the ones Christiane outlines. For me, the interesting notion, however, is not just that these are characteristics of the art formerly known as new media, but increasingly they are understood as characteristic of much of contemporary art from the candy spills of Felix Gonzalez-Torres to the interventions of Red 76 to the activism of Bureau d'Etudes to the DIY aesthetic of Thomas Hirschhorn to the network topologies of Carey Young.

BW Technology has definitely forced a reassessment of what is a work of art. Not that there haven't been prior means and reasons to question the function and meaning of art. However, and as Christiane points out, technology used to make art today is not specific to art making, and does not necessarily need to be customized for this type of production. Photography is the first technology that was not necessarily meant to be used for making art. Yet, it was pioneered by people who are regarded as artists today. The exploration that led to the development of the

moving image was carried out by researchers who are also regarded as artists, to a certain extent. Artists have been attracted to this technology and the technologies that followed (such as video) because, in their mind, these technologies enabled them to develop work that better represented the world they inhabited.

What is clear, however, is that the more complex this equipment becomes, the harder it is to customize: micromechanics imply that most human beings do not understand them physically, but in conceptual terms; hence the need for instruction manuals. Work produced with technology that was not meant to be used primarily by artists means that artists have to comply with those technologies as such. Obsolescence, for instance, will increasingly force the artists to rethink the relationship they maintain with their work over time. It also means that the marketability of those types of works is increasingly predicated by the fact there is no way to tell how long these forms will last. Over time, the work will have to evolve, and the only way to restage it will be to follow a set of instructions as well as records of previous "stagings;" one thinks here of the notion of Variable Media (pioneered by Jon Ippolito at the Guggenheim Museum, developed with colleagues at the museum as well as with others at the Langlois Foundation).[5] Soon, the curator

may become a conductor of sorts, directing the installation crew/orchestra. Like music or theater, art will literally have to be interpreted; it will become open (as in Umberto Eco's concept of "Opera Aperta").[6]

Another shift to take into account in thinking about how digital technologies have transformed art is how hypermedia have accelerated the fragmenting of time and the notion of historical continuum. If one considers the importance of hypertext fiction as developed by people at Brown University (Hypertext Fiction Workshop) as a precursor to hypermedia thinking, one realizes that the notion of fragmented narrative dates back to at least the mid-1960s, and has quietly permeated our thinking process since then.[7] Is it out of this fragmentation of thoughts, which opens the door to a more fluid reassembling of ideas, that led Francis Fukuyama to posit the end of history back in 1989?[8] Possibly…

On a completely different note, it is interesting to think how major art museums (first MoMA in the late 1990s, then Tate in 2000, and more recently, the Pompidou, among others) have been staging new presentations of their permanent collections that are no longer recounting the history of art as a continuum, but constantly reevaluated in the light of "now;" or concerns that transcend the notion of the "Genealogy of Thoughts." "Now" has

become the matrix for reading the past and the future: historical perspective has somehow been substituted with the notion of layers and an ever more layered understanding of reality. Layered images was a significant aspect of Peter Greenaway's *Prospero's Books*, a work

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that in my mind really was at the forefront of this kind of aesthetics. It somehow prefigured the consumer-end software such as Photoshop,® which introduced layering about seven or eight years ago. Layering also seems to be at the core of Julie Mehretu's paintings, which seem to be developed as a system rendering, more than a one of depiction. Rather than being represented, reality is constantly "re-rendered!"

MC Re-rendering reality as you describe it or, in some cases, even reconstructing the "semblance" of life itself, seems to be a direction artists using new technologies are taking—particularly those exploring artificial intelligence (AI) and artificial life (AL) forms. What do you think is the significance of the fact that artists are investigating and incorporating artificial intelligence and artificial life forms in their work?

CP Artists have always used and reflected on the technologies of their time, and it would be surprising if they wouldn't address issues surrounding artificial intelligence and artificial life. In his book *Beyond Modern Sculpture*, Jack Burnham stated, "Behind much art extending through the Western tradition exists a yearning to break down the psychic and physical barriers between art and living reality—not only to make an art form that is believ-

ably real, but to go beyond and furnish images capable of intelligent intercourse with their creators."[9] I think the notion of art as "living substance" that allows for communication with the viewer/audience has always been an implicit goal of artistic practice, although this type of interchange has mostly played out as a mental event when it comes to more traditional art forms.

Artistic practice in the realm of AL and AI often raises fundamental questions about the concepts of intelligence and consciousness, as well as the relationship between artists and their "creations," which take on a life of their own. The social interaction with increasingly independent machines and software systems invites a discussion about the possible forms that a man-machine symbiosis might take.

At the basis of digital art projects in the realm of artificial life are inherent characteristics of digital technologies: the possibility of infinite "reproduction" in varying combinations according to specified variables. Artificial life research uses evolutionary computation techniques such as genetic algorithms to represent "solutions" to an environment, deciding which "solutions" get to reproduce and how things reproduce. This obviously raises numerous questions, ranging from philosophical to aesthetic, and artists have explored them for quite a while.

AI, on the other hand, attempts to generate heuristics, symbols or rules to find solutions for problems of control, recognition and object manipulation. The underlying assumption is that problems can be solved by applying formal rules for symbol manipulation—a task digital computers handle well. Another area of AI research is focused on man-machine communication and a variety of artists, among them Lynn Hershman Leeson, have explored possibilities of creating "intelligent" virtual beings and personae who are capable of learning. The best-known artificial intelligence "characters" or "chatbots" developed outside of an art context are Eliza, created by Joseph Weizenbaum at the MIT Artificial Intelligence Lab in the 1960s, and her much more advanced colleague ALICE (Artificial Linguistic Computer Entity), designed by Dr. Richard S. Wallace. ALICE operates on the basis of AIML, or Artificial Intelligence Markup Language, a markup language that allows customizing ALICE and programming how she could respond to various input statements.

SD The fascination with AL and AI is centuries older than Mary Shelley's *Frankenstein*, but some would argue that as we are increasingly able to intervene at the genetic and molecular levels in living entities; biology is the new

We all exist on a continuum of "cyborgness"...

media. As with *telematique*, new capabilities give rise to new world views, and artists are as likely to explore them as are scientists, business people, economists and clerics, among others. As with the art formerly known as new media in general, boundaries diffuse, and the strict separation of "life" and "artificial life" becomes less and less clear. Theorists such as N. Katherine Hayles, among many others, prefer to point to the example of the blind person's cane or someone's eyeglasses as examples of "technologies" that cannot be easily separated from "natural" sight.[10] We all exist on a continuum of "cyborgness"—AL.

BW I'd agree with Christiane that artists would, of course, be interested in addressing the changes brought by these technological evolutions. The way AI is changing our perception of the biological vs. the technological is something that also finds its roots, as Steve points out, in the fascination human beings have had in the supposed perfection of machines vs. humans and their inability

to detach themselves from their emotions. High-end computer processing that enables machines to "understand" and to be "intelligent" means we can finally see the reality of all the fantasies enacted in books and films for a very long time (obvious precursors being H.G. Wells with *The Time Machine* or Fritz Lang with *Metropolis*). Lynn Hershman Leeson's *DiNA*, a virtual candidate to the presidency of the United States last year, adopted this very witty slogan: "Artificial intelligence is better than no intelligence." This project epitomizes the fantasies, fascination and fear humans entertain with the idea of a man-made superior intelligence form that would supercede God. In that same vein, I remember an interesting polemic that took place about 25 years ago in France over the spelling of *servo* (which I guess would be the equivalent of "processor"), which people started spelling *cerveau* (French, for "brain").

MC Going back to Christiane's comment about the fact that artists have always used and reflected on the tech-

nologies of their time, gaming opens new territory for artists. What do you think is the significance of gaming in terms of art today?

SD Gaming is the new television, and it represents both a dominant cultural context and a set of strategies that many, especially younger artists are exploring, along with the military, newspapers, advertisers, the education system and every segment of society that has as part of its mission to engage audiences, especially if they are younger.

CP There are obvious connections between games and new media arts: many of the navigation paradigms commonly employed in the virtual realm were originally developed in video games; as new media art, games can be networked and collaborative and often allow players/users to expand the virtual world. It is no surprise that new media artists are increasingly exploring games, be it through modifications that examine the architecture and control paradigms of existing games or original, artist-created games. Computer games have an enormous narrative potential (for example, through AI), which still remains under explored and both artists and the industry have been working on expanding narrative possibilities.

BW I remember a discussion once about games that led to the notion of rule. The conclusion was that without rule, there is no game. Rules may be the narrative structure of games; in the case of computer games, the vast majority still rely upon very basic rules: accumulate (lives, weapons) through destruction and annihilation. As they become more sophisticated, these rules tend increasingly to look like scenarios. There again, I think it is interesting to see artists take the rules and bend them to create new forms (Tom Betts would be one example that comes to mind,) or take their cue from the arbitrariness of rules to invent new—somewhat absurd—ones, as Paul Johnson does. The main difference between the notion of game and the one of narrative is that as open as a narrative structure may be, it never seems to be something that can actively be changed by the viewer/user/reader/visitor. Computer games, instead, base their dynamics on hiding the fact the game is a preset environment wherein limits are usually easy to find, for those who want to. I remember early videos by Miltos Manetas, for instance, which attempted to deconstruct that illusion.[11] I guess one of the main rules of computer games is to relinquish any form of doubt or concern about the fact that there is, by essence, always a limit to its interactive quality.

...portable, wearable, and nomadic computing is one of the most significant directions that digital art has been taking today...

MC What do you see as some of the most significant directions artists using digital technologies in their work are taking today?

SD To not view themselves as primarily or, especially, exclusively digital artists. That said, I'm very interested in how the ability to embed increasingly miniaturized and powerful "computers" (silicon chips) in everything from portable personal devices to tables to buildings will impact the work of artists; the ability to locate these devices through GPS or other triangulation services; and the ability to always have access to a network are creating new interactive and reactive expe-riences that are out of the box of the computer and in the environment. I think we may see artists venturing in this direction.

BW Indeed. It seems to me that they are increasingly interested in breaking the boundaries, being included in the larger ongoing discourse of contemporary art.

However, with contemporary art being governed more and more by market driven concerns, it also means these artists have to comply with certain rules of rarity that prevail in the art market. Hence, the possible loss of an edge: indeed, there are very few artists like Jodi, for instance, who continue to systematically refuse any links with the gallery system, even when nicely asked! I'd be interested to see how artists appropriate the phenomenon of "technomadism."[12] [I think, for instance, of collective narratives being developed based on simple technology, such as SMS or MMS, and the appropriation of such tools by fiction writers as exciting directions as well.[13]] Matt Locke developed a project with support from the British cell phone company Vodaphone during the Edinburgh Theatre festival a few years ago… I can only imagine that we will get to see more of these type of things. I also think of a project that was produced by Young-Hae Chang Heavy Industry using the screens of Internet-ready refrigerators to distribute their work, *BUST DOWN THE DOORS*, at the Rodin Museum in Seoul, 2004.[14] However, that also requires new economic forms to sustain this kind of work.

CP I very much agree with Steve and Benjamin that portable, wearable and nomadic computing is one of the most significant directions that digital art has been

...and it remains to be seen in how far the more traditional art world will be able to accommodate this form of artistic practice.

taking today. During the past few years, the field of so-called nomadic, locative media—portable works using PDAs (Personal Digital Assistants), cell phones, embedded micro-processors, GPS, etc.—has been exploding. The concept of what constitutes "networks" has been changing over the last decade: 10 years ago, most people associated "the network" with the Internet, accessed from a computer in the privacy of their home or office. This notion has fundamentally changed, and many works of networked art now exist in multiple manifestations—an installation in a gallery might be accompanied by a website that is affected by information people contribute via their cell phones or BlackBerries®. Some works—among them *PDPal* by Scott Paterson, Marina Zurkow and Julian Bleecker; *MapHub™* by the Carbon Defense League; or *D-toren* by Q.S. Serafijn—establish a system that allows participants to "annotate" physical spaces, connecting the geographical environment to individuals' emotions and behaviors. This type of practice

very much connects to the concept of "psychogeography" developed by the Situationists (and its subgroups Lettrist International and the London Psychogeographical Association) in the late 1950s. Other works such as Teri Rueb's *Itinerant* are focusing more on narratives that can be "retrieved" from the environment via mobile devices (similar to Janet Cardiff's projects).

Mobile, locative media work obviously constitutes a further move out of and away from the gallery and museum, which become only one node in the network, and it remains to be seen how far the more traditional art world will be able to accommodate this form of artistic practice.

NOTES

1 Shot simultaneously in one take using four digital cameras, the film *Time Code* features a quadruple-split screen on which four separate stories unfold simultaneously in real time, building to a final, climatic moment in which they all unexpectedly come together.

2 Oulipo (Ouvroir de Littérature Potentielle, or Workshop of Potential Literature) is a group of contemporary writers and mathematicians including Raymond Queneau, François Le Lionnais, Claude Berge, Georges Perec and Italo Calvino.

3 Yael Kanarek (b. 1967, New York City) is an artist who employs narrative and journal writing in her online project *World of Awe* to explore connections between storytelling, travel, memory and technology. See www.worldofawe.com for an interactive experience with this work.

4 Geert Lovink (b. 1959, Amsterdam), media theorist, net critic and activist, holds a Ph.D. from University of Melbourne. He has been teaching and lecturing on media theory throughout Central and Eastern Europe. Some of his books include *Empire of Images* (1985), *Cracking the Movement* (1990) and *Uncanny Networks* (2002). He has also co-organized numerous conferences and new media fairs such as *Next Five Minutes* (1993, 1996, 1999) and *Ars Electronica* (Linz, 1996, 1998).

5 Variable Media is a network of organizations spearheaded by the Guggenheim Museum that is involved in developing new preservation strategies (tools, methods and standards) for the Guggenheim's collection of conceptual, minimalist and video art.

6 In *Opera Aperta* ("Open Work"), semiotician Umberto Eco argues that literary texts (or, for our purposes, digital art) have fields of meaning rather than linear strings of meaning. These fields are understood as open, internally dynamic and psychologically engaging, allowing the reader (viewer) to play an active role in the creation of meaning.

7 "Hypertext" is a term coined by computer populist Ted Nelson to describe writing done in the nonlinear, nonsequential space of the computer. Prior to the initiation of the Internet, Brown University professor and William Faulkner Award-winning author Robert Coover began the "Hypertext Fiction Workshop," a course devoted to exploring and using this new virtual writing space.

8 Francis Fukuyama, *The End of History and the Last Man* (1993). Based on an article Fukuyama wrote for *The National Interest* in 1989, this book questions whether humanity will ever reach a stable state of complete satisfaction or if the human condition instinctively avoids equilibrium in favor of chaos. A study of political philosophy, Fukuyama's thesis is that history is directional and that its endpoint is capitalist liberal democracy.

9 Jack Burnham, *Beyond Modern Sculpture.*

10 N. Katherine Hayles, Professor of English and Design/Media Arts at University of California, Los Angeles, teaches and writes on the relations of science, technology and literature in the 20th century. She is the author of *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature and Informatics* (1999), which won the Rene Wellek Prize for the best book in literary theory for 1998–99, *Writing Machines* (2002) and *My Mother Was a Computer: Digital Subjects and Literary Texts* (2005).

11 Miltos Marinas (b. 1960, Athens, Greece) is a digital artist who coined the term "neen," which describes visual artists who use digital media and the Internet as the subject and platform for all of their work. Marinas's work has been exhibited at venues such as the Centre Pompidou, the Musée d'Art Moderne de la Ville de Paris and the Artsonje Museum in Seoul. His work and writings can be found at www.manetas.com.

12 "Technomadism" is loosely defined as having an "on-line existence" that is entirely mobile; that is, using wireless computer devices like cell phones and laptop computers.

13 "SMS" is Short Message Service, a service for sending messages of up to 160 characters to mobile phones that use Global System for Mobile (GSM) communication. "MMS" is Multimedia Message Service, a method derived from SMS that allows for non-real-time transmission of various kinds of multi-media contents like images, audio and video clips.

14 An Internet refrigerator (sometimes called a "Net fridge") is a version of the familiar kitchen appliance with a built-in Internet-ready computer that includes an MP3 player, camera, microphone and e-mail and video capabilities. Young-Hae Chang's artist group, Young-Hae Chang Heavy Industry (YHCHI, founded 1999) used these sophisticated appliances to show its work, www.yhchang.com/BUST_DOWN_THE_DOORS!.html.

WORKS IN THE EXHIBITION

All dimensions: height x width x depth

PAUL CHAN
*Happiness (finally) after 35,000 Years of Civilization—
after Henry Darger and Charles Fourier*, 2000–2003
Digital animation with sound: mini-PC and screen
suspended 40 inches above ground
Projection: 2 x 7 feet, 17 minutes 20 seconds
Courtesy of the artist and Greene Naftali Gallery,
New York

LYNN HERSHMAN LEESON
DiNA, 2004–6
Networked artificial intelligent agent
Artificial intelligence mark-up language and Java code,
3D Pulse Veepers software, voice-recognition software,
text-to-speech software, PC, microphone
Projection: 10 x 5 feet
Courtesy of the artist and bitforms Gallery, New York

CHARLES SANDISON
Index, 2006
Site-specific installation for MOCA Cleveland
Projected data: code, computers, projectors
Appx. 2,000 square feet
Courtesy of the artist and Lisson Gallery, London

ANNE-MARIE SCHLEINER
PS2 Diaries, 2005
DVD Machinima Video
LCD screen, computer, headphones
11 minutes
Courtesy of the artist

CHRISTA SOMMERER and LAURENT MIGNONNEAU
LifeWriter, 2006
Interactive computer installation: computer, code,
projector, typewriter, table, chair
Dimensions variable
Courtesy of the artists

JOHN F. SIMON, JR.
All John F. Simon, Jr. works are courtesy of the artist
and Sandra Gering Gallery, New York

Stack #1, 2005
Software, Apple Mini®, data projector
Projection: dimensions variable

Endless Victory, 2005
Software, Apple G4 PowerBook®, acrylic plastic
29 x 29 x 3 inches

Endless Bounty, 2005
Software, Apple G4 PowerBook®, acrylic plastic
21 x 17 x 3 inches

Fountain, 2004
Software, Apple G4 PowerBook®
Projection: 8 x 10 feet diptych

aLife, 2003
Software, Apple G4 Titanium PowerBook®, acrylic plastic
21 x 17 x 3.5 inches

Automata Studies, 2002
Software, Apple G3 PowerBook®, acrylic plastic
19 x 16 x 3 inches

CPU v1.5, 2001
Software, Apple G3 PowerBook®, LCD screen
48 x 28 x 4 inches

Color Panel v1.5, 2001
Software, Apple G3 PowerBook®, LCD screen
48 x 28 x 4 inches

ComplexCity, 2000
Software, Apple G3 PowerBook®, acrylic plastic
19 x 16 x 3 inches

LEO VILLAREAL
Instances, 2005
LEDs, microcontroller, custom software, aluminum
3 panels, each 24 x 24 x 3 inches
Courtesy of the artist and Sandra Gering Gallery,
New York

CYBERLOUNGE
A selection of links to internet art projects, artist
websites, digital art exhibitions and new media
organizations worldwide
Computer stations

ARTIST BIOGRAPHIES

CHARLES SANDISON Born 1969, Scotland.
Lives in Tampere, Finland.
www.torisdalebay.com

Charles Sandison received his MFA (1993) and BA in photography from the Glasgow School of Art (1991). He has worked mainly with computer-generated data projections that combine language, form, movement and architecture. Sandison is currently a visiting professor at the Le Fresnoy Studio National d'Arts Contemporain, in Lille, France.

Sandison has exhibited widely in Europe with one-person exhibitions in 2005 at Lisson Gallery, London; Galerie Frank, Paris; Ardnt & Partner, Berlin; and Galerie Jean Bernier, Athens. Other solo exhibitions include those at the Cornerhouse Centre for Visual Art, Manchester, England (2005); the Kiasma Museum of Contemporary Art, Helsinki (2004); the Centre d'art Contemporain George Pompidou, Cajarc, France (2003); and La Criée Centre d'Art Contemporain, Rennes, France (2002). Group exhibitions include ARS 06, Kiasma Museum of Contemporary Art, Helsinki (2006); the Moderna Museet, Stockholm (2004); *Zones of Confluence*, Villette Numérique 2004 Festival, Paris; *Algorithmic Revolution*, Zentrum für Kunst und Medientechnologie (ZKM), Karlsruhe (2004); *Loop04*, Barcelona (2004); *Plateau of Humankind*, 49th Venice Biennale (2001); and

Kiasma Museum of Contemporary Art, Helsinki (2001). In 2006, Sandison will exhibit in a group exhibition at the Bonn City Art Museum, Germany; a solo project at the Musée d'Orsay, Paris; and a retrospective at Koldo Mitxelena Kulturunea, San Sebastian, Spain.

Sandison's work was first shown in the United States at Yvon Lambert Gallery, New York, in 2005. *All Digital* marks Sandison's first museum exhibition in the United States.

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Beaux Arts 221 (October 2002): 46.

LYNN HERSHMAN LEESON Born 1941, Cleveland, OH
Lives in San Francisco, CA
www.lynnhershman.com

Lynn Hershman Leeson received her BA from Case Western
Reserve University, Cleveland (1962) and an MA from San
Francisco State University (1972). She is currently Emeritus
Professor at the University of California, Davis, and A. D. White
Professor at Large at Cornell University, Ithaca, NY. Hershman
Leeson's work has been featured in more than 200 exhibitions
internationally. She has created 53 videotapes, 8 interactive
installations, 3 web-based installations, two feature films, and,
has edited the book *Clicking In: Hot Links to a Digital Culture*
(1996). She has been recognized internationally with awards
such as the ZKM/Siemens Media Art Award (1995) alongside
director Peter Greenaway and theorist Jean Baudrillard; the
Golden Nica in Interactive Art at Ars Electronica (1999); and
the Alfred P. Sloan Foundation Feature Film Prize in Science
and Technology at the Hamptons International Film Festival
for her film *Teknolust* (1999-2002). Hershman Leeson has had
retrospectives at the National Gallery of Canada in Ottawa and
at the Henry Art Gallery in Seattle (2005), which, in 2006, will
travel to the Media Museum of ZKM (Zentrum für Kunst und
Medientechnologie), Karlsruhe. A monograph of her work, *The
Art and Films of Lynn Hershman Leeson*, was published in 2005
by the University of California Press. Hershman Leeson's work
is in the collections of the Museum of Modern Art, New York;
Seattle Art Museum; DG Bank, Frankfurt; Walker Art Center,
Minneapolis; and the Media Museum of ZKM (Zentrum für
Kunst und Medientechnologie), Karlsruhe, among others.

Hershman Leeson has lectured and written extensively about
new media. From 1984-1993 she was the Director of the
Inter Arts Center, San Francisco State University, and from
1993-2005, a professor of electronic art at the University of
California, Davis, where she founded the IDEA Media Lab.

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431—36.

JOHN F. SIMON, JR. Born 1963, Louisiana
Lives in New York, NY
www.numeral.com

John F. Simon, Jr. received his MS in earth and planetary sciences from Washington University in St. Louis, MO (1987), an MFA in computer art from the School of Visual Arts, New York (1989) and a BA in art and BS in geology from Brown University, Providence, RI (1985).

Simon's solo exhibitions in 2005 include *Stacks, Loops and Intersections: Code Sketches*, University Art Museum, State University of New York at Albany; *ElectroScape*, Zendai Museum of Modern Art, Shanghai, China; *Metamorfosis*, Museo Extremeño e Iberoamericano de Arte Contemporáneo, Badajoz, Spain; *John F. Simon, Jr.*, Alexandria Museum of Art, Louisiana. In 2004, he had exhibitions at the Knoxville Museum of Art, Tennessee; SITE Santa Fe, Santa Fe, New Mexico (2002); and Sandra Gering Gallery, New York (2000).

Selected group exhibitions in the last five years include *Techno Sublime*, Colorado University Art Museum, University of Colorado (2005); *Seeing Double: Emulations in Theory and Practice*, Solomon R. Guggenheim Museum, New York (2004); *Digital Sublime–New Masters of the Universe*, Museum of Contemporary Art, Taipei, Taiwan (2004); *media_city seoul* 2002, Seoul Museum of Art, Korea (2002); *Art Futura Festival*, Centro de Cultura Contemporanea de Barcelona, Spain (2002); *BitStreams*, Whitney Museum of American Art, New York (2001); *2000 Whitney Biennial*, Whitney Museum of American Art, New York.

Simon's work is in the collections of the Museum of Modern Art, New York; Solomon R. Guggenheim Museum, New York; Whitney Museum of American Art, New York; San Francisco Museum of Modern Art; Los Angeles County Museum of Art. His work is in many private collections including the Robert J. Schiffler Foundation, Greenville, Ohio and the Progressive Corporation, Cleveland, Ohio.

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CHRISTA SOMMERER Born 1964, Austria.
Lives in Linz, Austria.

LAURENT MIGNONNEAU Born 1967, France.
Lives in Linz, Austria.

www.iamas.ac.jp/~christa

Christa Sommerer and Laurent Mignonneau are professors at the University of Art and Design in Linz, Austria, where they head the department for interface culture at the Institute for Media. They previously held positions at the IAMAS (International Academy of Media Arts and Sciences) in Gifu, Japan. Sommerer has an MA from the Academy of Fine Arts in Vienna (1990) and Ph.D. from CAiiA-STAR (Center for Advanced Inquiry and Interactive Arts, University of Wales Newport– Science, Technology and Art Research Centre, University of Plymouth) (2002). Mignonneau has an MA from the Academy of Fine Arts in Angoulème (1991) and Ph.D. from the University of Kobe, Japan (2001).

Sommerer and Mignonneau have exhibited their work exten- sively worldwide in more than 150 exhibitions in 2005 including the Victoria and Albert Museum, London; Zendai Museum of Modern Art, Shanghai, China; the *WIRED NEXT FEST '05*, Chicago; and the Museo Conde Duque, Madrid. Exhibitions of their work in 2004 include the *Dutch Electronic Art Festival*, Rotterdam; *Microwave Media Art Festival*, Hong Kong; *Digital Avant-Garde—25 Years of Ars Electronica*, Lentos Museum, Linz, Austria; *Navigator*, National Taiwan Museum of Fine Arts, Taipei; *Science + Fiction*, Deutsches Museum, Munich; *European Media Art Festival*, Osnabrueck, Germany; *WissensKuenste— Bilder jenseits des Bildes—Das lebende Bild*, Hamburger Bahnhof, Berlin. Their works are in collections around the world, including the Media Museum of ZKM (Zentrum für Kunst und Medientechnologie), Karlsruhe; the NTT InterCommunication Center, Tokyo; the Cartier Foundation, Paris; Millennium Dome, London; Tokyo Metropolitan Museum of Photography; AEC (Ars Electronica Center), Linz; NTT Plan- Net, Nagoya, Japan; Shiroishi Multimedia Art Center, Japan; and House of Shiseido, Tokyo.

Sommerer and Mignonneau have won major international media awards including the Golden Nica for Interactive Art at Ars Electronica (1994); the Ovation Award at the Interactive Media Festival (1995); the Multi Media Award, Multimedia Association of Japan (1995); and were among the finalists for the World Technology Award for Arts of the World Technology Network (2001). They have published extensively on artificial life, interactivity and interface design and have lectured at universities, international conferences and symposia worldwide. Sommerer is an international co-editor for *Leonardo*, an online journal published by the MIT Press, and in 1998, together with Mignonneau, edited a book on the collaboration of art and science called *Art@Science*, published by Springer-Verlag.

PAUL CHAN Born 1973, Hong Kong.
Lives in New York, NY.
www.nationalphilistine.com.

Paul Chan received an MFA in film, video and new media from Bard College (2002) and BFA in video and digital arts from the School of the Art Institute of Chicago (1996).

Acclaimed as an artist of allegorical utopian and apocalyptic animated video, Chan is also a dedicated political activist who has been involved in such activist groups as Voices in the Wilderness and the Iraq Peace Team.

Chan's work appeared in a solo exhibition in the UCLA Hammer Museum's *Projects Series* in Los Angeles in 2005 and will be featured in a solo exhibition at the Blanton Museum of Art in Austin in 2006. Among his numerous group exhibitions are *Utopia Station*, 2005 Venice Biennale; *I still believe in Miracles*, Musée d'Art Moderne de la Ville de Paris (2005); *Greater New York*, P.S.1 Contemporary Art Center, Long Island City, New York (2005); *New Work/New Acquisitions*, Museum of Modern Art, New York (2005); the eighth Biennale d'Art Contemporain in Lyon (2005); and the 54th *Carnegie International*, Carnegie Museum of Art, Pittsburgh (2004). He has exhibited his films and videos at the Walker Art Center, Minneapolis; the Museum of Modern Art, New York; the Museum of Contemporary Art, Chicago; and at numerous film and video festivals in the United States and Europe.

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LEO VILLAREAL Born 1967, Albuquerque, NM.
Lives in New York, NY.
www.villareal.net

Leo Villareal received a Masters of Professional Studies (1994) in the Interactive Telecommunications Program at New York University, where he specialized in virtual reality, simulation and interactive television, and a BA (1990) in installation sculpture and video from Yale University. He also spent two years as a member of the research staff at Interval Research, a private think tank in Palo Alto, California, founded by Paul Allen.

Villareal has exhibited his work in galleries, museums and public spaces and has received a number of site-specific commissions.

Among his recent solo exhibitions are those at Galeiria Javier Lopez, Madrid; and Marc Selwyn Fine Art, Los Angeles (2005); Sandra Gering Gallery, New York; Conner Contemporary, Washington, DC (2004 and 2003); and Finesilver Gallery, San Antonio (2003).

Selected group exhibitions include *Extreme Abstraction* at the Albright-Knox Art Gallery, Buffalo, New York (2005); *Visual Music* at the Hirshhorn Museum and Sculpture Garden, Washington, DC (2005); Los Angeles Museum of Contemporary Art (2005); and *Greater New York*, P.S.1 Contemporary Art Center/MoMA, Long Island City, New York (2005).

Among Villareal's site-specific commissions are *Chasing Rainbows/New Haven*, Yale University, New Haven, Connecticut (2004); GSA Art-in-Architecture project, federal courthouse

by Antoine Predock, El Paso, Texas (2003–4); *Supercluster*, P.S.1 Contemporary Art Center/MoMA, Long Island City, New York; *Lightscape*, Palm Beach Institute of Contemporary Art, Florida (2002); Museo de Arte Moderno, Mexico City; *Massless Medium: Explorations in Sensory Immersion*, Creative Time in The Anchorage, Brooklyn; *KMX Reenergize Zone*, Moby concert tour (2001).

His work is in the collections of the Brooklyn Museum of Art; Naoshima Contemporary Art Museum, Kagawa, Japan; and the Jack S. Blanton Museum, Austin, Texas.

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Adrian Dannatt. "Synthesiser's Synthetic Synthesis: Leo Villareal." *Art Newspaper*, no. 116 (July/August 2001): 79.

ANNE-MARIE SCHLEINER Born 1970, Providence, RI
Lives in Boulder, CO
www.opensorcery.net

Anne-Marie Schleiner received a BA in studio art from the University of California at Santa Cruz (1992) and an MFA in computers in fine art from the San Jose State University, California (1998). She is currently an assistant professor of fine art at the University of Colorado, Boulder.

Schleiner's work has been exhibited widely in new media festivals, on the Internet and in exhibitions in the US and abroad. Her most recent work, *Corridos* (2005), is an opensource videogame commissioned by *InSite 05*, San Diego, California. Selected exhibitions include *TechnoSublime*, Colorado University Art Museum, University of Colorado at Boulder (2005); *Centro de la Imagen*, Museum of Photography, Mexico City (2004); *Killer Instinct*, The New Museum, New York (2004); *Media City Seoul 2004*, Seoul Museum of Art, Korea (2004); and the 2004 *Whitney Biennial*, Whitney Museum of American Art, New York (2004); *Hip Hop Killed the Video Star*, Akademie Schloss Solitude, Stuttgart, Germany (2003); *Wooshi Wooshi and Anti-Sonar Female Sound Performance Night*, Barcelona, Spain (2003); *Games: Computerspiele von KunstlerInnen*, Phoenix West's Reserveteillager Warehouse, Dortmund Hoerd, Germany (2003); and *ALT Media Exhibit*, American Museum of the Moving Image, New York (2003).

Schleiner has curated many online exhibits of game mods and add-ons including *Luckykiss* (2000); *Adult Kisekae Ningyou Sampling*; *Cracking the Maze: Game Patches and Plug-ins as Hacker Art* (1991), a project that presented subversive game modifications and game patches by digital artists; *Snow Blossom House* (2001), an interactive Japanime game and erotica commissioned for the Sonar Festival in Barcelona, Spain; and *Mutation.fem* (1999) an exhibit hosted by Alien Intelligence, Kiasma Museum, Helsinki, Finland.

Schleiner has designed the games *Anime Noir* (2002) and *Heaven711* (2002-4) and runs a website focused on game hacks and open source digital art forms called opensorcery.net. She has taught at universities and artist workshops and participated in art residencies in Germany, Belgium, Spain and Mexico.

FURTHER READING

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Anne-Marie Schleiner. "Parasitic Interventions: Game Patches and Hacker Art." See www.opensorcery.net.

GLOSSARY

Algorithm
A step-by-step problem-solving procedure, such as a mathematical formula or a computational procedure for solving a problem in a finite number of steps.

Artificial Intelligence
The ability of a computer or other machine to perform activities that are normally thought to require intelligence – human thought and reasoning. Also, the branch of computer science field concerned with the development of machines having this ability. Also referred to as AI.

Artificial Life
Computer programs or computerized systems that simulate the behavior, population dynamics or other characteristics of biological organisms. Also referred to as AL.

Avatar gender construction
Gender construction of "virtual" personas that exist on the Internet, in games and in cyberspace.

Bot
Abbreviation for robot.

Code
A system of symbols and rules representing instructions to a computer; the language of a computer program.

CyberArt
Any computer generated artistic endeavor or art form that exists in the virtual reality of the Internet.

Cyberspace
A term that refers to the perceived 'virtual' space within the memory space of computers or networks. A popular science fiction

Cyberspace continued

term first thought to have been used by the novelist William Gibson, cyberspace refers to an entirely computer-generated immersive world comprising the total data on computers networks worldwide.

Data

Numerical or other information represented in a form suitable for processing by computer.

Game-modding

Game modification

Hypertext

Coined by computer populist Ted Nelson to describe writing done in the nonlinear, nonsequential space of the computer. Prior to the initiation of the Internet, Brown University professor and William Faulkner Award-winning author Robert Coover began the "Hypertext Fiction Workshop," a course devoted to exploring and using this new virtual writing space.

Intelligent Agent

Software that is designed to use artificial intelligence to automatically carry out an assigned task, mainly retrieving and delivering information.

Interface

The navigational methods and devices that allow users to interact with the virtual three-dimensional space of a computer program. The simplest form of computer interface is the keyboard, through which the user controls the computer by typing in commands.

Metabot

A word invented by Lynn Hershman Leeson referring to a bot that goes beyond normal bot structures to demonstrate a higher level of pattern recognition.

Netizen

A citizen of the Internet.

Net Art

Art created for and existing on the Internet.

Pataphysics

The French absurdist concept of a philosophy or science dedicated to studying what lies beyond the realm of metaphysics, intended as a parody of the methods and theories of modern science and often expressed in nonsensical language.

Reality

The quality or state of being actual. The totality of all things possessing actuality, existence or essence. That which exists objectively and in fact.

Telematics

The combination of telecommunications and computing.

Telepresent

Refers to the ability through telecommunications or computer technologies of communicating over distance and being "present" in more than one place at a time—for example, being present in one city but also being "present" in another geographic location via video conferencing, or being "present" in another location via email.

Telerobot

A robot operated by telecommunications systems or by Internet-based systems.

Virtual Reality

Commonly refers to the hypothetical three-dimensional visual space created by computers ranging from 3D games to "alternate realities" created on the Internet. Originally, Virtual Reality referred to "immersive environments"—to the simulation of real or imaginary worlds or systems and three-dimensional "experiences" in which "users," with the help of head-mounted displays, data gloves or body suits (containing fiber-optic cabling) experience a simulated world that appears to respond to the user's movements.

ACKNOWLEDGMENTS

Plunging into the field of digital art has been an invigorating and mind-opening experience. I thank, above all, the artists in this exhibition – Lynn Hershman Leeson, Charles Sandison, Leo Villareal, Anne-Marie Schleiner, Christa Sommerer and Laurent Mignonneau, Paul Chan and John Simon, for their imaginations, for their ideas and for creating and lending their extraordinary work to this exhibition. They are truly an inspiration.

For their record of exhibitions and scholarship in this field I am greatly indebted to Christiane Paul, Adjunct New Media Curator, Whitney Museum of American Art; Benjamin Weil, Adjunct New Media Curator, San Francisco Museum of Modern Art; and Steve Dietz, Director, ISEA2006 Symposium + ZeroOne San Jose: A Global Festival of Art on the Edge. Their work has served as a foundation for this exhibition and the CyberDiscussion they participated in is an especially insightful component of this catalogue. To Jeffrey Shaw, for his catalogue essay and Michael Rush, Director of

Rose Art Museum of Brandeis University for his contributions to the discourse in the field, I am also grateful. In particular, I would like to thank Benjamin Weil for conversations that were important in the initial stages of the development of this project, and Jurgen Faust, Dean of Integrated Media Chair The Cleveland Institute of Art T.I.M.E. Program, for the dialogue which informed the selection of artists for this exhibition. Special thanks to Leonard Steinbach, CIO at The Cleveland Museum of Art and Kristina Woolsey, a pioneer in the development of interactive multimedia, for their expert insight as peer readers for the catalogue introduction.

Steve Sacks of bitforms Gallery in New York; Sandra Gering and Mariana Baer of Sandra Gering Gallery, New York; Carol Greene and Kathleen Eagan of Greene Naftali Gallery, New York; and Leigh Conner, Conner Contemporary Art, Washington, DC, have all provided valuable assistance in coordinating loans to the *All Digital* exhibition.

I salute, once again, the outstanding staff of MOCA Cleveland. Jill Snyder, Executive Director, as always, serves as an inspiration and a catalyst for the cadre of excellence in exhibitions and programs here at the museum. Many thanks go to John Grayson, Director of Development, for his tireless pursuit of funding and to Grace Garver, Deputy Director Administration, for sustaining the financial and administrative platform for this project. In the Curatorial Department, my colleagues Ana Vejzovic Sharp, Associate Curator, and Megan Lykins, Emily Hall Tremaine Curatorial Fellow, provided invaluable assistance and support throughout the many aspects of this evolving project. Ray Juaire, Exhibition Manager, surmounted, with expertise and endurance, the many challenges that go along with presenting new media works. My sincere appreciation to Ann Albano, Director of Exhibitions, for monitoring schedules and the budget, and also to Kelly Bird, Nicole Ledinek, Rob Sikora, Jeremy Motsch, Jude Goergen, Catherine Nelson,

Paul Sydorenko, Terri Tokar and Heather Young for the excellence of their work in bringing ambitious projects here at MOCA Cleveland to fruition. Additionally, I am truly appreciative of Andrea Kormos for her humor and indefatigable spirit.

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