



NEWSLETTER number. 8 volume 19 July/August 1999
Artists Using Science and Technology

FACING REALITY



Facing Reality

This ain't your father's VR...

Remember the GM commercial that says "This ain't your father's oldsmobile"? That is the attitude that led me to Virtual Reality (VR) -- It ain't just for the guys! VR is much more than computer scientists creating big toys -- many women are driving new and different aspects of the field.

Often referred to as "VR" by media blitz hype, many realize that the term "virtual reality" is an oxymoron. Even VR, and its many conceptions, is a part of our reality. I prefer to view computers as tools to create environments that are experiential. Visualization combined with interaction expands research, art and education by opening new arenas for stimulating perception, cognition, and critical thinking.

This month's issue of the YLEM newsletter brings together a range of women artists, educators and scientists who, along with men, are exploring the dynamic aspects of Virtual Environments (VEs). They are creating interactivity and shaping the look and feel of VEs on desktops and in large screen projection systems like the CAVE™ Automatic Virtual Environment (CAVE).

Dr. Dena Elisabeth Eber provides an overview of VE creations and explains that a combination of divergent expertise enhances not only the process but also the final product. Eber shares her experiences with her classroom of artists and computer scientists by teaching an interdisciplinary approach to VE design.

Real life examples of designer and scientist at work are Josephine Anstey and Dave Pape, respective MFA and PhD students at the University of Illinois at Chicago's Electronic Visualization Laboratory. Together they develop and share the CAVE visual narrative experience, "The Thing Growing." "The Thing" engages the viewer in a dialogue and story development where the immersion becomes transparent and playful.

In an effort towards a better interface, Dr. Katy Börner explains how she creates a smart virtual environment in the CAVE. Smart VEs monitor participants' choices and compile these choices to create databases of information. The computer can use these databases to provide feedback to participants in order to help them accomplish tasks or to facilitate navigation through the virtual world.

Dr. Carol Gigliotti, a distinguished professor and scholar, explores the types of standards that experiential worlds demand. Her research questions the ethical and aesthetic decisions surrounding VEs and provides direction for creating meaningful experiences. In this installment of her work, she describes her latest project "Astrolabe: Ethics and Virtual Technologies," a website, CD-Rom and online journal (<http://www.cgrg.ohio-state.edu/Astrolabe>).

Professor Julieta Aguilera explains, through poetry, how metaphor and architecture build a virtual world not only for the eye but for the heart and mind.

Enjoy!

Margaret Dolinsky

dolinsky@indiana.edu

Margaret Dolinsky is a visiting Professor and Research Scientist at Indiana University. Dolinsky's CAVE artwork has been featured at Ars Electronica Center, the Total Museum, "Virtual Spaces" in conjunction with ISEA97, VRAIS and ThinkQuest. "Blue Window Pane" will be on exhibit at SIGGRAPH '99.

members' news

The Art and Math Conference begun by **Nathaniel Friedman** of the math department at SUNY Albany, morphed into the Interdisciplinary Conference of the International Society of the Arts, Mathematics and Architecture (ISAMA) and was held in San Sebastian, Spain in June. Other members on its committee: **Bruce Beasley, Harriet Brisson** and **Carlo Sequin**.

Joan Webster Price and **Herbert Price**, known for their solar-powered sculptures, surprised us this spring with a show of neon poetry works at their shows in Lima, OH.

Ken Knowlton, who in 1965 wrote the program at Bell Labs that turned scanned images into characters that the computer could print out, has pursued the mystery of how we meld dot-like patterns into images. He is now doing seashell mosaics, and his portrait of Mark Twain (below) was featured in the juried centerfold spread of *Art Calendar* in July. If you visit the Exploratorium, see his portrait of Jacques Cousteau.



Ken Knowlton *Mark Twain, Seashell mosaic.*

ylem forum

Exploring the Fractal Geometry of Dreamtime, featuring the G2 Institute, Wednesday, September 15, 7:30 pm in the McBean Theater
The Exploratorium,
3601 Lyon St., San Francisco, CA

The G2 Institute was formed in 1996 to explore the premise that the collective, archetypal imagination has the potential to create syntheses between new science, art & life, and thus help activate a shift to a new aesthetic mode of being in the next millennium. Located in Sausalito, the institute has held seminars at the San Francisco Art Institute and the California Institute for Integral Studies.

"G" stands for Goodman, the name of a building which, twenty years ago, was an artists' live-work space slated for redevelopment. In a protracted battle with City Hall, the artists won a grant from the city to relocate. Thus, Goodman 2, a model live-work cultural complex based on holistic dynamics was born on Potrero Hill. Veterans of that battle have personal experience with the transformative nature of creative community, but more: ideas linking the very nature of the creative process with new theories of architecture, anthropology, geometry and dynamical systems. On this basis, they have formed the G2 Institute and invited scholars and activists from many disciplines to participate.

G2 Institute Advisory Board members scheduled to explore the evening's topic are: Ralph Abraham, chaos theorist and Professor Emeritus of Mathematics at UC Santa Cruz, author of "Chaos, Gaia, Eros" and numerous mathematical texts. Mali Burgess, artist, founder of the Tetrahedron Trust and the Foundation for the Future. Niccolo Caldararo, anthropologist, Adjunct Professor of Anthropology, San Francisco State University, artist and art conservator, published on subjects including Native American Codices and the Dead Sea Scrolls.

(continued on page 8)

(continued on page 8)

INTRODUCTION

A virtual environment (VE), also known as virtual reality (VR), is a synthesized digital space generated by a computer and its peripherals. In this world a user is immersed or surrounded by sound and imagery. Among other possibilities the hardware may include a head mounted display (HMD), an electromagnetic tracker, or CAVE hardware, which is an unencumbered environment that displays imagery on three walls and a floor (Kalawsky, 1993).

Although the most common uses for VEs are commercial or military, there are a handful of artists who use VE technology as an art form. Most recently, artists such as Brenda Laurel, Rachel Strickland, Char Davies, and Rita Addison have used VE technology to create computer based virtual environment art installations. These most successful works were created by teams of artists and scientists in settings with dedicated hardware and software.

In both my research (Eber 1997a, 1997b) and in making my own VE pieces, I found that such an art form provides new aesthetics and experiences for both the teams creating the installation and the viewer interacting with it. Despite the appeal to create works in a new medium with new aesthetics, there are relatively few artists who are producing VE installations. Because creating a full blown VE work requires a facility and a team of artists and scientists, making such installations is out of reach for most artists. Cross-disciplinary teams, along with the new, evolving characteristics of VE, pose a fresh set of aesthetic challenges for the artist. In limited ways, I believe that these challenges can and should be addressed in more university art and computer science programs, thus bringing the VE medium into the realm of possibilities for more artists.

ONE VE INSTALLATION

My research is not the only factor that informs my belief that artistic VEs provide vivid and rich aesthetic experiences. *Feminine Fertility* was a VE that I created which was about a search for some understanding of what it meant to be a "productive" woman. In it, viewers waded through a black and white world of organic

yet functional objects, some of which represented female reproductive organs. My intention was to examine the function of the "objects," thus questioning what it meant to be feminine.

The viewers' ultimate quest in this work was to find the fertility ball, a colored crystal womb, which they were to assume had the answers to the investigation. In it, the viewers were confronted with imagery that was both beautiful and tragic at once, thus raising more questions than answers surrounding female fertility. (See stills from this VE on the opposite page.)

To make this work, I was fortunate enough to use the facilities in the computer science department at Georgia Tech and call on a team of computer scientists who were willing to help me wade through the hardware, software, and programming difficulties. It is my hope to create a similar, but perhaps not so extensive setting in which college level artists and computer scientists can create, experience and address VE works of art.

THE PROMISE OF VE IN UNIVERSITY ART PROGRAMS

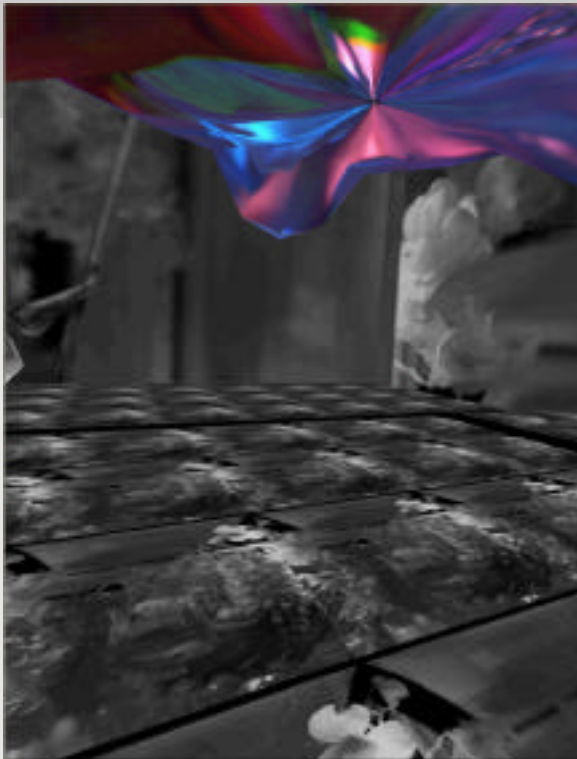
Facilities such as the Electronic Visualization Lab (EVL) at the University of Illinois in Chicago are settings dedicated to artists and scientists working together to make VEs. Although this birthplace of the CAVE is an optimal facility, it is not the kind of setting that can presently be commonplace in university art programs. Paradigms of Artistic Virtual Environments, or the PAVE project is an investigation of how the VE medium can be addressed in art schools.

The PAVE project will create a collaborative academic environment for artists and computer scientists to design, construct, and evaluate immersive VE art installations. We will use an SGI workstation, an HMD, electromagnetic trackers, and VE software, all of which are in reach for some university computer art programs. The software and HMD run on PCs, which will make this possible for an even greater number of universities.

(continued on page 9)



Dena Elisabeth Eber, *Grab #1 from the Feminine Fertility Virtual Environment*



Dena Elisabeth Eber, *grab #2 from the Feminine Fertility Virtual Environment*

The Thing Growing

Josephine Anstey and Dave Pape

The Thing Growing is a Virtual Reality application for CAVE or ImmersaDesk. Its focus is the construction of the "Thing", a virtual, interactive, animated character. The goal of the project is to create an interactive story in which the user takes a leading role and is engaged at an emotional level with the Thing and its world.

The project started life as a short story. The idea behind the story was to convey the sensations of a claustrophobic relationship; the sense that your personal, psychological, even physical self is being invaded; conflict because the invader loves you and you love them; fear of the consequences of repelling them, and of your own anger and powerlessness. In 1995 I enrolled at the Electronic Visualization Laboratory and encountered the CAVE. Fairly quickly I felt that I had discovered a medium that fitted the story I wanted to tell, and that could better represent the experience I wanted to explore.

My feeling that the CAVE was a good medium for this story was based on several of its properties. It is user-centered instead of identifying with the protagonist the user actually is the protagonist. It is an immersive environment - the senses are affected directly without a mediating text. As I am specifically aiming to create emotional and psychological reactions this seemed an advantage. Finally, it was possible to make the Thing an interactive character, and to create an environment where the user would become engaged with it emotionally.

The total experience is divided into three scenes. In the first scene the user enters the environment and discovers the Thing. In the second scene the Thing entices the user into a dance. In the third scene the user and the Thing are caught by the Thing's cousins. They are disgusted with the inter-species relationship they perceive. They beat the Thing, trap it and the user in a cage, and plot to kill them. The denouement comes as the Thing provides the user with a gun. The user can shoot them out of the cage; and, if he or she chooses, kill all the cousins.

Then there is a moment of confrontation. The Thing suddenly believes that the user will shoot it. It is the user's choice.



Josephine Anstey *The Thing Growing* 1999.

© Anstey 1999

By this time, the ideal user has been interested in the Thing and liked it, then felt overwhelmed and irritated by it. Then the user's sympathy is tugged as it is being hurt by its cousins and the user's sense of loyalty is aroused because they are on the same side. Finally the user has had a chance to wreak mayhem on the cousins and release tension and aggression. However, whether the user shoots or doesn't shoot the user will not escape from the Thing, just as we repeat the patterns of dysfunctional relationships. The user who shoots is returned to the very beginning of the application and told that he or she can stay alone in that rather empty world forever, or go and find the Thing. The user who doesn't shoot is returned to the Thing directly - and the Thing continues to teach the interminable dance. ~~xxxxxx~~

Josephine Anstey is a virtual reality artist, a writer and a video-maker. Her VR work has shown widely; she is a winner of the Chelsea Award for short fiction; and her video works are in the collection of the Museum of Modern Art, NYC.

Dave Pape is a Ph.D. student in the electrical engineering and computer science department of the University of Illinois at Chicago. His research interests include virtual reality and scientific visualization.

The Thing Growing will be on exhibit at SIGGRAPH '99 on the Panoram screen in the Electronic School House.

Some calendar items are reprinted from Art Calendar (the monthly marketing and career management journal for artists, P.O.Box 199, Upper Fairmont, Md; Subscriptions \$32/yr), Artweek, Leonardo Electronic Almanac, Artech <artstech@the.city.sfsu.edu>, and Fine Arts Forum Online <paulbrown@siggraph.org>.

We cannot verify all information sent to us. Please inform us of incorrect information.

All events and exhibits are in the San Francisco except where noted.

We want your announcements!

To insure that they appear in the next newsletter send 6 weeks before the publication date. Announcements may be e-mailed to Lewis Bangham at Banghaml@hotmail.com. Also send notices to the Ylem website where they can appear on shorter notice. Please see web site guidelines. (Address on back cover.)

YlemForums are held the second Wednesday of January, March, May, July, September and November at the Exploratorium, 7:30 pm.

Citizens at the Crossroads: Whose Information Society?

London, Ontario, Canada
21 - 24 October 1999

A conference to address issues related to the growth of the knowledge-based economy and society. Specifically it will address citizenship in the information society by exploring the forces that advance and impede civic participation, in the developing and developed world.

<http://www.fims.uwo.ca/Info>

Manjunath Pendakur,
Dean
Chair, Conference
Program Committee
Faculty of Information
and Media Studies
The University of Western
Ontario
London, ON N6A 5B 7
Canada

InSEA World Congress

Brisbane, Australia
21 - 26 September 1999
The Australian Institute of Art Education (AIAE) will host the 30th International Society of Education through Art (InSEA) World Congress at the Brisbane Convention and Exhibition Centre, September 21 - 26 1999.
Visual Arts educators

from all over the world will have the opportunity to experience Australian school life, meet educators from other countries, share ideas, collaborate on future work and discover new ways of teaching and learning aspects of visual arts.

Info
Ozacom Conference Services
ph. +61 7 3854 1611
fax + 61 7 3854 1507
ozacom@eis.net.au
<http://www.qut.edu.au/insea99/insea>

A Call for Entries

Deadline for entries
November 19, 1999
DPIñDigitally Propelled Ideas A National Juried Exhibition
The purpose behind the exhibit iDPI, which stands for digitally propelled ideas, is to provide a venue and bring together artists who have been actively involved in using computer technology to create works that allow the viewer an aesthetic experience from a variety of disciplines, including fine art, graphic design, illustration, photography and video (see media and specifications Media and specifications Any original art created on a computer, whether from

inception or from scanned images that have been combined and/or manipulated. Work must be output to a medium that can be wall-hung. Digital videos are eligible in VHS format.

Juror and curators are Diane Fenster, Patrick Merriland Babette Mayor. Open to all artists and designers residing in the United States
Entry Fee and slides \$10.00 for the 1st entry, \$5 per additional slide(s).

For more information and/or a printed prospectus write Patrick MerrillW. Keith and Janet Kellogg University Art Gallery California State Polytechnic University 3801 West Temple Avenue, Pomona, California 91768 or call 909.869.4301, 909.869.3508 or Fax: 909.869.4939.

Prix Ars Electronica

4 - 9 September
The Festival Ars Electronica 99, celebrating its 20th anniversary this year, begins on 4 September and ends on 9/9/99 (!). The Festival focuses this year on the theme (continued p. 7)

"LifeScience", which also signals a new emphasis of the Ars Electronica on the way to the 3rd millennium. <http://prixars.orf.at>
Selected works will be presented at the Ars Electronica Festival in exhibitions, screenings, etc. The awards presentation will take place on 6 September 1999 at the Upper Austrian Regional Studio. This event will be broadcast live by the satellite program 3Sat.

Info

Gabriele Strutzenberger
ORF/Prix Ars Electronica
Europaplatz 3
A-4010 Linz
ph. ++43/732/6900-24267
fax: ++43/732/6900-24270
gabriele.strutzenberger@orf.at

TURING to 2000

The headline title for the 17th conference of eCAADe recognises the important contribution of Alan Turing who in 1936 wrote an important paper on computing machines leading to the idea of a Universal Turing Machine. The core purpose of the conference is to respond to the fact that we are approaching the end of the Millennium. What we aim to do with "Turing to 2000" is reflect on where we have been with CAAD education and research: to review both the major advances made and the fruitless dead ends that have been pursued.
University of Liverpool, UK

15 - 18 September 1999
<http://www.ecaade.org/ecaade99>
Info
Andy Brown, Mike Knight and Phil Berridge
School of Architecture and Building Engineering
The University of Liverpool, UK
ecaade99@liverpool.ac.uk
Artistic Director
HYPERLINK <mailto:k.armstrong@qut.edu.au>
k.armstrong@qut.edu.au

Two new books from Leonardo

Leonardo/ISAST and MIT Press announce the release of two exciting new books in the Leonardo Book Series: "The Digital Dialectic: New Essays on New Media," edited by Peter Lunenfeld, and "Art and Innovation: The Xerox PARC Artist-in-Residence Program," edited by Craig Harris. Both books deal with the multifaceted nature of new media through both theoretical and hands-on approaches in search of the ways in which we will communicate and create tomorrow.
Info:
<http://mitpress.mit.edu/e-journals/Leonardo/isast/leonbooks.html>

Editorial Department
LEONARDO
425 Market St. 2nd Floor
San Francisco CA 94105
USA
+1 415 405 3335 voice
+1 415 405 7758 fax
HYPERLINK
<mailto:isast@sfsu.edu>

Now open - visit the **Web Projects** created by trAce Workshop participants. After an intense 10-week series of encounters, we have a gallery of works for you to view.
<http://trace.ntu.ac.uk/writers/sanford/program.html>
Britgrrls: No Bark and No Byte? In this month's Opinion, Liz Bailey, an American living in Britain, deplores the lack of e-zines created by British women. What are the implications for British women in the workplace? "For most of them, tech hasn't yet broken the cool barrier. But why?" she asks. Does anyone have the answer? Send us your Opinion!

<http://trace.ntu.ac.uk/opinion/>

Info

trAce international online writing community
Faculty of Humanities,
Nottingham Trent University, Clifton Lane,
Nottingham NG11 8NS UK
ph. ++ 44 (0)115 948 6360
fax ++ 44 (0)115 948 6364
<http://trace.ntu.ac.uk>
HYPERLINK
<mailto:trace@ntu.ac.uk>
trace@ntu.ac.uk

SPACE INVADERS - THE PROJECT

While each of the eight artists participating in this exhibition have established careers working with installation, performance and new media, for SPACE INVADERS they have been commissioned

to develop new site-specific projects designed specifically for the virtual space of the world wide web. Space Invaders aims to interrogate and expand the use and function of the world wide web, creating a space that experiments and explores the limits of existing three dimensional practices, and their ability to translate and function effectively in a virtual environment.

<http://www.culture.com.au/scan/artspace/>

Info

<<http://www.artspace.org.au>>

Glossolalia: Electronic Journal For Experimental Literature And Arts, Issue 11, June 1999 has been released and is available on the WWW from the following URL:

<http://www.saunalahti.fi/jlehmus/index.html>

The publication returns after a two years' hiatus and will be published on a monthly basis.

J. Lehmus
Publisher and editor
jlehmus@ns.tts.fi

members' news

Other members involved with *Art Calendar* recently:

Dorothy Simpson Krause and **Michael Ward von Uchtrup**, who were judges for centerfold contests.

Michael was also written up in an article about art consultants in the magazine's May issue.

If you bought the US Postal Service stamp raising money for breast cancer research, its graceful Matisse-like design was by **Barbara Nessim**.

Mary Lou Bock, owner of the Williams Gallery of Princeton, continues to bring the best in digital fine art to new audiences. She was curator of a show at the law offices of Stark & Stark in Lawrenceville, NJ in March.

The Digital Giraffe, website of **Corinne Whitaker**, keeps winning prizes. This time StudyWeb Researchers voted her "one of the best educational resources on the Web." www.giraffe.com

Another site worth checking if you are interested in performance multimedia, visual music, audio excellence, compositional thinking in performance, and electronic arts productions is that of composer **Ron Pellegrino**, www.microweb.com/ronpell/home.html

ylem forum

Martha Senger, conceptual artist-activist and the Institute's founding director.

Each speaker will make a 20 minute presentation, with slides, followed by 10 minute discussions. After the panel presentations, the topic will be opened to general discussion.

Free, open to the public, wheelchair accessible.

(From page 3)

The goal of this project is to explore VEs as an emerging art medium within the context of an academic art setting. The project will focus around a collaborative laboratory in which the students in art and computer science will work. From this setting we will draft paradigms for artistic VEs, ones that will address aesthetics, teamwork, and the creative process.

The aesthetics will include dialogues that critically address VE works of art. These issues were raised in the SIGGRAPH 95 panel Aesthetics and Tools in the Virtual Environment (Greuel, 1995), in which the participants discussed questions surrounding the boundaries of the medium and its expressive capabilities. They also identified an aesthetic, saying that the experience of a VE work could be about movement among pure visual forms, thus enabling a new kind of movement. One goal of the PAVE project is to investigate these and other emerging aesthetics.

I believe that this cross-disciplinary setting will provide valuable results for university art programs, artists, as well as those working in industrial settings in which artists and computer scientists work collaboratively.

CONCLUSION

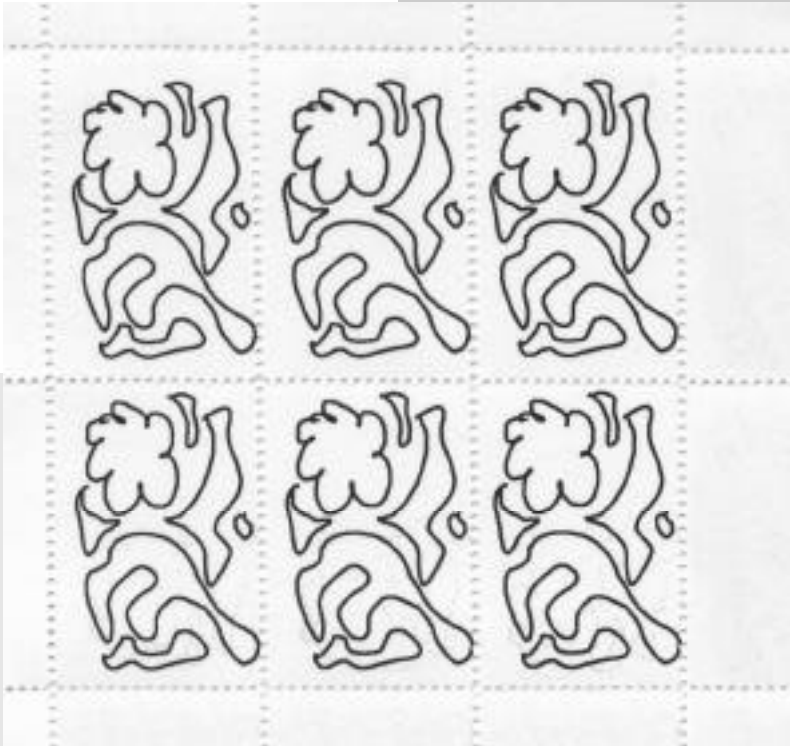
Artistic virtual environments already are, and will continue to be an evolving and expressive art medium. Works like ...phEmÈre by Char Davies and Strait Dope by Margaret Dolinsky are testimonies to the spirited and unique qualities of the medium. My own VE works, as well as my formal research also support the notion that VEs provide novel aesthetic experiences. However, both my research and my artwork suggest that the VE medium is still not accessible to the number of artists who I believe will make a crucial dent in addressing criticism and the understanding of artistic VEs. The PAVE project will, among other things, address how university programs in art and computer science can create cross disciplinary VE course work. From this, we will examine teamwork, including how artists and computer scientists work together and how artists can create expressive works in this setting. Finally we will explore ways to critique and dialogue about the emerging aesthetics of this evolving art form. xxxxx

Dena Elisabeth Eber, Ph.D. is an assistant professor of Computer Art at Bowling Green State University. Her research includes the creative process surrounding artistic Virtual Environments and other forms of electronic and digital art.

REFERENCES

- Eber, D. E. (1997a). *The creative and learning process of digital artists making a virtual environment work of art*. (Doctoral dissertation, University of GA, 1997).
- Eber, D. E. (1997b). *The aesthetic experience with a virtual environment work of art*. Paper presented at Electronic Imaging and the Visual Arts, Paris, France. Paper published in the conference proceedings and in The Journal of the Georgia art education association, Spring, 1998.
- Greuel, C. (1995). Panel chair, Aesthetics and Tools in the Virtual Environment. In Computer graphics, the conference proceedings of SIGGRAPH 95, pp. 490-491.
- Kalawsky, Roy S. (1993). *The Science of Virtual Reality and Virtual Environments*. Wokingham, England: Addison-Wesley Publishing Company.

Y L E M G A L L E R Y



Eleanor Kent *Star Dance Post*, Laserprint on perforated gum stock, 1997.



Marius Johnston *Flowers*, Digital print, 1999.

Blue Window Pane

Margaret Dolinsky



Blue Window Pane (Man Ray Series) Still from CAVE Environment © Dolinsky 1999. Man Ray photograph courtesy of Sandor Family Collection

"Blue Window Pane" is a CAVE art experience that stages a virtual environment as performance and projective construction. The non-linear, non-hierarchical structure theatricalizes a subversive and confrontational stream of consciousness movement. Participants navigate through an interior hallway to encounter admonishment from the "guards," shattering window panes and face magnificent icons leading to alternate worlds that suggest alteregos.

The "Hallway" is the scene of establishment and the point of continual return. Here, choices unfold the multi-layered events of self-determination: unexpected encounters, passageways, epiphanies and brick walls. It is here that the entire scene can be contemplated but the insanity drives one to return to the inner hallway.

The icon swells closed behind the participant who now faces a curtain. It shrouds a mask, a face of a woman, another face of consciousness. Her visage is serene, quiet and calm. If approached, her eyes open and she begins to chant. The environment becomes filled with hums, whispers and ramblings. It is a tunnel: at each end is a face, one strong and one faint. The stronger face will lead back to the hallway, to where one came

from - a point of recognition. The fainter view leads to a new environment called the "Stair Scene."

The "Stair Scene" features "people" staring, spiral stairs, and sound activated graphics. Proximity to a figure or group of figures invokes a particular piece of audio and activates the figures to dance in synchronicity. Each figure displays personal characteristics: it takes on attitude, changes shape, gains a voice, adopts an anthem, dances in unison or remains independent. The scene is a metaphor for a public persona with its dance of exchanges and stares. The way out is to rise above it by climbing the spiral stairs to the top.

Back in the "Hallway," beyond the guards, the windows shatter to usher in a private, familial scene, the "Living Room." The animate characters closely watch a surreal television.

Their noses touch the screen as the frequencies change between a bedroom in the clouds, an exotic dancer, or airplanes crashing in an evening sky. Nearby, a clock hangs in mid-air. The clock is the Angel of Life, its drawers chime out the open and shut cases of life.

The CAVE is a theater that presents a visual spatial media of shapes, landscapes and sounds that establish a system for construction and symbolic transformation. Participants are given the stage to exercise the guidance of their cognitive structures and ascertain the meaning and content of the virtual experience, inhabit the virtual space and transform the projection. The uncharted, unexplored and undefined medium of CAVE virtual environments requires its portrait to be painted with the symbol systems of both computers and arts.

"Blue Window Pane" is a journey through a rebus of artistic metaphor, symbolic transformation, and multi-sensory interaction excavated in the world of the CAVE. <http://www.evl.uic.edu/dolinsky/interiors/> ~~XXXXXX~~

Margaret Dolinsky is a visiting Professor and Research Scientist at Indiana University. Dolinsky's CAVE artwork has been featured at Ars Electronica Center, the Total Museum, "Virtual Spaces" in conjunction with ISEA97, VRAIS and ThinkQuest. "Blue Window Pane" will be on exhibit at SIGGRAPH '99.

Smart computer systems that adapt, customize, and personalize to the user can be built using two very different approaches. One is to build robots that are able to manage the real world as if they were copies of ourselves. The other is to design smart virtual environments (VEs) that enhance human capabilities by giving human users and machine systems a common basis to interact and enhance each other.

I personally prefer the second approach -- to build interactive virtual worlds that wrap around human users (by the use of a virtual reality technology) and give humans and computers equal access (maybe not rights) to the displayed virtual world. Commonly shared virtual environments also provide the means to track human behavior in an extensive way. Applying Artificial Intelligence (AI) techniques, the computer can unobtrusively "learn," "process," "store," and subsequently "support" human activity.

VegoWelt is a smart VE that I designed with four graduate students (Sven Bertel, Mitja Hmeljak, Matt Jadud, and Bob Najlis). It uses a children's playroom scenario for demonstrating and evaluating the support of manipulation activity.



Katy Börner *VegoWelt* Still from the CAVE environment

VegoWelt exploits the CAVE at Indiana University's VRVE Lab to improve the match between the computer interface and the sensorimotoric capabilities of human users. Entering the CAVE, the user can manipulate an unlimited number of virtual objects (uniform geometric solids) by direct manipulation. S/he can choose different colors and build a variety of object-assemblies such as an arch, house, figure, etc.

The user's coordinates as well as the objects' changing positions are time-stamped and recorded. AI techniques are employed to detect patterns among the manipulation actions preferred by different users.

Obviously, when the system first interacts with a user, it has no knowledge about his/her preferences. The system basically provides an environment to manipulate objects. During subsequent runs, the system

creates a database of preferred object-assemblies. The computer then can anticipate participants' choices and highlight objects that one might typically pick next. It can also display object-assemblies from its database that are similar to the current model. The participant can then incorporate these structures into the activity. The system also provides larger object-assemblies (for example these objects can be combined to build a house: a basement, intermediate levels, and a roof). As a result, the VegoWelt experience becomes increasingly challenging as the user interacts with it. ~~xxxxx~~

Katy Börner (katy@cs.indiana.edu) is a Computer Scientist and designer of virtual environments that support the audio-visual manipulation and navigation of complex data spaces. She is currently working as a Professor at Indiana University, Bloomington.

To Rise, Lifted by the Eyes (Remontarse Alzado por los Ojos)

Julieta Aguilera

This line was given to me by an elder student at the first poetic event I attended at the school of Architecture where I received my degree in Graphic Design. The writing was a personal anonymous welcome. It expressed what poetry meant to Architecture and Design for the person that wrote it. At this school, I was taught from the perspective that poetry opens up space (Heidegger), architecture designs that space in response, and graphic design occupies its surface in a poetic way. This idea of the world we work in has supported the connection between what I see and how I think about it.

Seeing in virtual environments has made me re-examine this relationship. In a virtual world, architecture is immaterial. Only what is defined by the eyes remains. The interaction is only real as a visual experience (for the sake of space). This limitation to what is visible corresponds to a definition of the sacred as what we can visualize but cannot touch.

Like a sacred object or place that may invite us to deeper thought, that which is visible but not touchable leaves us with the remaining senses' desire to understand imprinted in the mind. Touching in this situation is transposed to the eyes. The entire body is channeled through vision which defines substance, density, scale, and other spatial characteristics of the constructed reality.

Graphic Design, in its pure sense, is a discipline that studies and elaborates on visual language. In the making of an interactive image, its appearance seems to react to our eyes rather than our hands. This may not only be applied towards a still visual result, but opens up the possibility of inviting the viewer into the creative process of making connections. Forms are not presented as objects but as metaphorical constructions, like in poetry.

But even when this is a feasible and reasonable possibility, environments are generally approached in their design as a reminiscence of still images or shapes, and Graphic Design is restricted to a flat grid where

imagery appears in layers for stylistic reasons, and interpreting based on our history of communication.

I think of space in a virtual world as a space for the eyes, a surrounding surface for vision. Departing from Architecture, I see the connection more in a distribution of meaning, a space to be inhabited by the eyes. For this, a different kind of awareness of what we experience is needed. This implies studying which are the formal elements that make for a spatial visual experience, and overlooking cultural dead ends of past ways of representation.

In designing this view, sketches of interestingly shaped actual spaces are useful. After preliminary observations are made, the question is what would constitute a metaphorical space. For example, to be inside the image means that the structure is no longer visible at once. This situation leaves the image of the whole to be visible only when reconstructed inside the mind of the viewer. The emphasis shifts from a completed statement to a design where elements of continuity lead the viewer through the experience in depth, as a process.

To think about this process in terms of poetry -of relevant associations of meaning- focusing on the connections that open three dimensional space for the eye also provides a collaborative basis in terms of content. Space then becomes the site of a planned event which conclusion relies on the viewer's completion of movement.

For a design artist, understanding an environment as metaphor is a major step in the treatment of visuals created to be used in interface design and virtual worlds. This is not only a reasonable view but a necessary strategy in approaching an evolving visual language. ~~xxxxxx~~

Julieta Aguilera has a Graphic Design degree from the Catholic University of Valparaiso, Chile, School of Architecture, 1989. MFA from University of Notre Dame, 1997. She is currently teaching at the Art Department of Plymouth State College in New Hampshire. julieta@oz.plymouth.edu



Artists Using Science and Technology

Board of Directors

- Trudy Myrrh Reagan** President
- Gary Zellerbach** Treasurer
- Eleanor Kent** Membership Chair
- Barbara Lee** Artist
- Ken Rinaldo** Artist
- Jo Falcon** Artist
- Stephen Wilson** Writer
- Marius Johnston** Artist

Advisory Board

- Will Cloughley**
Synapse Productions
- Theodosia Ferguson**
International Society for the Arts, Sciences, and Technology
- Nancy Frank**
Frank Relations
- Nathaniel Friedman**
Dept. of Mathematics, SUNY Albany
- Robert Gelman**
Artist
- Roger Malina**
Center for Extreme Ultraviolet Astrophysics
- Dr. Clifford A. Pickover**
IBM Thomas J. Watson Research Laboratory
- Sondra Slade**
Synapse Productions
- Fred Stitt**
S.F. Institute of Architecture
- Jim Thompson**
Lockheed Martin Missiles & Space Co.
- Joan Truckenbrod**
School of the Art Institute of Chicago

Newsletter

- Jo Falcon**
Proof Editor
- Marius Johnston**
Executive Editor, Graphic design and production
- Eleanor Kent**
Label Production
- Lewis Bangham & Michael Strasmich**
Calendar Coordinators

Forums

- Trudy Myrrh Reagan**
Ylem Founder
- Larry Shaw**
The Exploratorium

Website

- Marius Johnston**
Director

Ylem Yearly Membership includes:

Members Directory

An annual publication in which you are listed along with approximately 250 other artists of new art forms.

Newsletters

The bi-monthly Ylem Newsletter contains articles on numerous topics along with news of members, a **Calendar** of events and art opportunities.

Forums

Ylem presents bi-monthly Forums at San Francisco's Exploratorium, curates art shows, and arranges special site visits.

Ylem Slide Registry

An opportunity to join our Member's slide registry. The registry is presented to curators by the Ylem Exhibits Committee, An initial fee of \$15.00 (\$5.00 annual renewal) is charged to cover the preparation of professional-level presentations.

Electronic Membership Option

On-line members receive their Directory and Newsletters via the Internet (paperless). Ylem's Gallery on the World Wide Web. An opportunity to exhibit your work in our Web site. Visit Art on the Edge at <<http://www.ylem.org>>.

Name _____

Business Name _____

Address _____

City _____ State _____ Zip Code _____ Country _____

Home Phone _____ Work Phone _____ Fax _____

E-mail _____ Web Site _____

Please describe your work and/or interests in 30 words or less for the directory (art-media, art-science or technology-related interests, activities, services).

check _____

(use extra paper if necessary)

OPTION: "Please do not include my name when the Ylem mailing list is sold to other members for mailing"

OPTION: "Please do not include my name or information in the Online Directory"

One-Year Member Rates

US Individual	\$30
US Institutaion	\$45
US Student or Senior	\$20
Electronic Newsletter	\$20
Contributing Member	\$100
Donor Member	\$300
Patron Member	\$500
Cyber Star Member	\$1000

Canada/Mexico add \$5 (US) and all other countries add \$15 (US) to US rates. (US currency only). Please mail in a check or money order payable to Ylem, P.O. Box 749 Orinda, CA 94563. Membership includes next edition of the Directory. For more information contact: Eleanor Kent (membership) <ekent@well.com>Tel: 415 647-8503

n., pronounced eye-lum,



1. a Greek word for the

exploding mass from which

the universe emerged.

An international organization of artists, scientists, authors, curators, educators, and art enthusiasts who explore the intersection of the arts and sciences. Science and technology are driving forces in contemporary culture. Ylem members strive to bring the humanizing and unifying forces of art to this arena. Ylem members work in new art media such as Computers, Kinetic Sculpture, Interactive Multimedia, Holograms, Robotics, 3-D Media, Film, and Video.

Ylem

**P.O. Box 749
Orinda, CA
94563
USA**

Contact

Information

Ylem Main Office
P.O. Box 749
Orinda, CA 94563
<ekent@well.com>

Ylem Newsletter Items
Trudy Myrrh Reagan
967 Moreno Avenue
Palo Alto, CA 94303
<trudymyrrh@aol.com>

Ylem's Website
Marius Johnston
498 Pershing Drive
Oakland, CA 94611
<<http://www.ylem.org>>
<mariusj@best.com>