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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

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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.



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n., pronounced eye-lum,



1. a Greek word for the

exploding mass from which

the universe emerged.

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