

Desktop Commodity-Level Immersive Environments

Steven C. Beck

University of Iowa
steven-beck@uiowa.edu

The financial resources once required to maintain multi-million dollar facilities dedicated solely to virtual reality applications are no longer an absolute necessity. The technology to develop and display multi-user, stereo 3D immersive environments is now available on the desktop. Personal computers and 3D game-specific graphic cards are now powerful enough to allow anyone with modern personal computers and an inexpensive, multi-player, first person 3D game engine to create and display reasonably convincing 3D stereo immersive environments. I will be demonstrating the use of a popular and inexpensive (<\$50) first person shooter (FPS) game engine to create convincing multi-user stereo 3d immersive environments using commodity-level (~\$2000) PC hardware. These environments can be experienced by booth visitors using inexpensive (<\$100) wireless LCD shutter glasses. Interested visitors may be provided with brief hands-on experience creating these environments, depending on booth traffic.

A Virtual Reality System for Neurobehavioral and fMRI Studies

Steve Baumann, Chris Neff, Scott Fetzick, Gregg Stangl,
Lee Basler, Ray Vereneck and Walter Schneider

Psychology Software Tools
Pittsburgh, Pennsylvania
<http://www.pstnet.com/>

We are developing a virtual reality (VR) system of software and hardware that will provide a flexible platform for a variety of neurobehavioral experiments that can be performed either in a laboratory or inside of MRI scanners. The VR software features 12 interconnected environments: an urban area, an apartment, a restaurant, a multiplex theater, a subway system, an airport, a village, a doctor's office, a house, a bank, a grocery store and a nightclub. Over 50 characters are available, many of them interactive. Many of the objects in the virtual world are interactive also, such as doors, chairs, bathroom fixtures and kitchen implements. Simple navigation and manipulation can be performed using a joystick and mouse or touchpad. More complex manipulations can be performed using a dataglove and motion tracker. All movements and actions by the subject are tracked to an Excel spreadsheet and/or to videotape. Physiological monitoring can be performed simultaneously and time-stamped. The VR system has been used successfully in an MR scanner during a spatial-navigation memory task to produce activation in multiple cortical areas expected to be involved in such a task, including bilateral sensorimotor areas, the SMA, the visual cortex, the cingulate and the frontal lobes. This is a prototype VR system that will eventually become a commercial product for researchers and clinicians, and we are seeking user feedback and suggestions for improving the final product.