Virtual Sound Composition for the CAVE

Robin Bargar
University of Illinois at Urbana-Champaign

The CAVE (CAVE Automatic Virtual Environment) is a new virtual reality interface developed by the Electronic Visualization Laboratory at the University of Illinois at Chicago and the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign. The CAVE consists of a room with walls, ceiling and floor that surround a viewer with projected images. Its design overcomes many problems of the problems encountered by other virtual reality systems. The CAVE made its premiere appearance at SIGGRAPH'92 and will also appear at SIGGRAPH'93 as well as in other VR venues. It is unique in involving multiple VR users in a common VR experience. This paper presents implementation strategies for virtual sound in the CAVE, and addresses conceptual and technical solutions to sound synthesis and auditory display issues associated with virtual environments. Primary issues include spatial localization of sound without headset encumbrance and the design of interactive auditory tools for navigating a virtual space. Head mounted and spatial speaker placement will be compared. Auditory representation of data displayed in virtual space, and principles of auditory feedback for kinesthetic interface will be discussed. Compositions and sound synthesis are necessary components in the design of a virtual information space, requiring a correlation of acoustic criteria with elements of computer graphic display. The CAVE may be treated as a multimedia performance space or as a composed multimedia environment for interactive exploration. This paper will include information from the SIGGRAPH'93 course on the CAVE.

(This paper will be provided as addenda upon receipt. (editor))