

Multiuser Virtual Reality based learning environment

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To provide a learning environment to a group of students, a virtual reality based 3D-chatroom was realized.

A well known seminar room of the University of Hagen was modeled in VRML. This virtual room is equipped with a virtual beamer and screen, to render a live audio/video stream (e.g. a lecture) or the desktop of a shared computer. The introduced multi-user virtual reality seminar environment [1] consists out of the underlying DeepMatrix [5] Java-based client-server system, an interface to the existing 'virtual-university'-user-database of the University of Hagen, a streaming video Application (Real-Server, Real-Producer) and the opensource 'Virtual Network Computing' (VNC)-tool.

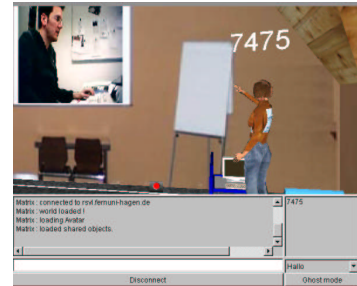


Figure 1: Live video-stream embedded into the VRML environment

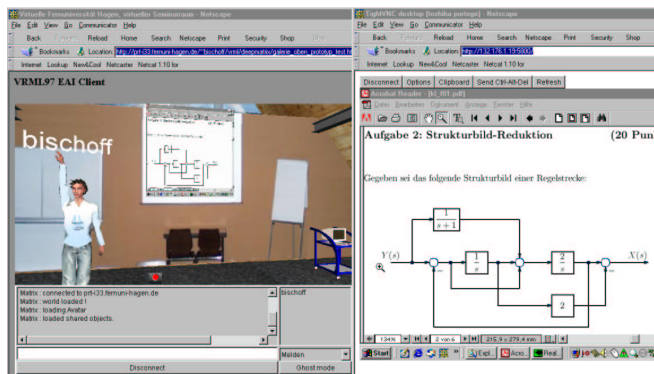


Figure 2: Web-based shared PC integrated into the VRML environment

All the remote users are represented by realistic human avatars. Every user is able to control gestures of his avatar. Some of these avatar-gestures are especially adapted to a typical classroom situation, e.g. 'put one's hand up' and 'point to', to provide non-verbal communication to the users. Today's VRML-browsers like Blaxxun Contact [3] and Parallelgraphics Cortona [4] are able to display Real-live-stream inside the VRML-world, if the Real-Player is installed onto the client-computer, so the streaming video could be used as a video-beamer application inside the modeled VRML-room.

To provide the users with a kind of a whiteboard an universal solution was selected. Not only Presentation-software like PowerPoint is frequently used to explain topics to a group of users. In different disciplines user-groups need different software-tools, or operating systems during seminar events. A universal solution is the remote control of a shared PC, simultaneously useable to all participants.

- [1] http://prt.fernuni-hagen.de/pro/virtuelle_umgebung/
- [2] <http://www.real.com>
- [3] <http://www.blaxxun.de/>
- [4] <http://www.parallelgraphics.com/>
- [5] <http://www.geometrek.com/products/deepmatrix.html>