

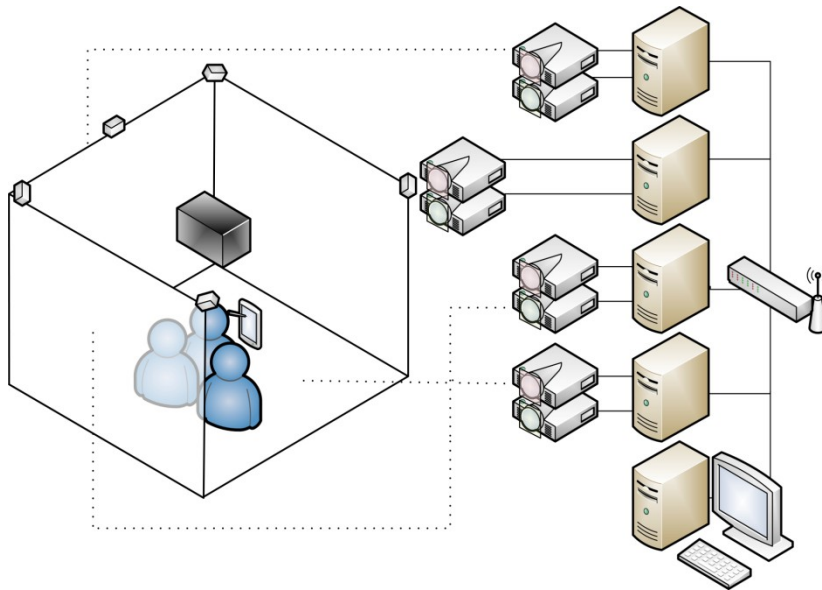
The Virtual Reality Lab

Fontys University of Information & Communication Technology ([FHICT](#)) at Eindhoven has a [VRLab](#) with a cave-like virtual reality environment. This device is operational since September 2008.

The Cave™ is an advanced visualization device that combines high resolution, stereoscopic projection and 3D computer graphics to a complete sense of presence in a virtual environment.

Cave system overview

- The cave features three walls and a floor. The screens are sized 3.12x2.50 m² and are backend projected with 2 DLP projectors (F20 SX+). The floor (2.50x2.50) is direct projected.
- Using Infitec Wavelength Multiplex Imaging the set of 2 projectors show passive 3D stereo. The great benefit of using infitec technology is that left/right eye stereo separation is independent on viewing angles.
- A magnetic tracking system (Polhemus Fastrak) with 2 sensors is used to produce the correct stereo perspective for the user.
- The computer system consist of 5 computers (Intel premium Core2 Quad Core(2.40 Ghz 8MB, 1066MHz)) each with one Nvidia GeForce 8800 GTX graphic card. 4 computers drive the beamer sets and 1 computer is a server. They are connected within a gigabit LAN. The server also manages a 5.1 audio system to bring spatial sound in the environment and handles the input devices.
- Open source software is used to develop applications (now VRJuggler, openscenegraph and VTK)



Projects

1. **VR Middleware in Java.** Our institution wants to concentrate on development and deployment of open source solutions for the interactive virtual environments. There is a variety of choices of additional development toolkits supporting portability between different operating systems or visualization environments. Our students are educated in Java but the most visualization open source projects are in C++. We want to embrace Java and Java 3D as programming environment. A framework in Java 3D can be developed to make applications in the Virtual Reality Cave. We want to build a VR software development environment in Java that provides a platform for virtual reality application development.
2. **Coupling Unity.** In the minor [Game Design & Technology](http://unity3d.com/unity/) we use the tool Unity <http://unity3d.com/unity/>. Unity doesn't support real-time 3D VR systems such as Cave environments. In this project Unity has to be made suitable to make VR-applications in the VRCave.
3. **Methodology for VR applications.** The development of a VR application can become a very complex process and for that reason it should be carried out by experts and technicians with the knowledge and experience required. However, there is a growing interest in tools that allow non-experts to either develop or participate in the development of these applications. Information and MediaDesign students of FHICT develop interactive 3D worlds for the VRCave. They use visual tools that make their work much easier. In addition, design and development of VR/VE applications is not a one-man task, but a complex multistage process with many participants. Design methodologies should provide a sequential

process to guide designers and facilitate communication among the members of the project team and users, and this is a characteristic that should be kept through every stage of the design process. In this project we want develop a methodology for the development of virtual reality applications.

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