VRLAB – TU Delft

The **iVR library,** developed at the VRLAB TU Delft, provides an easily prototyping environment for interactive virtual reality applications. It is cross-platform, supporting a number of existing VR systems, like projection Virtual Walls, Virtual Workbenches, desktop VR systems. **VRX toolkit**, the VR data explorer, provides a set of tools for VR exploration and visualization of data. It is a VR extension above the widely known VTK visualization toolkit. The current core and most extensions of the ivrlibrary are implemented in C/C++ under Linux. **Python wrapping** for both the iVR library and the VRX toolkit enables a rapid development of VR visualization applications.

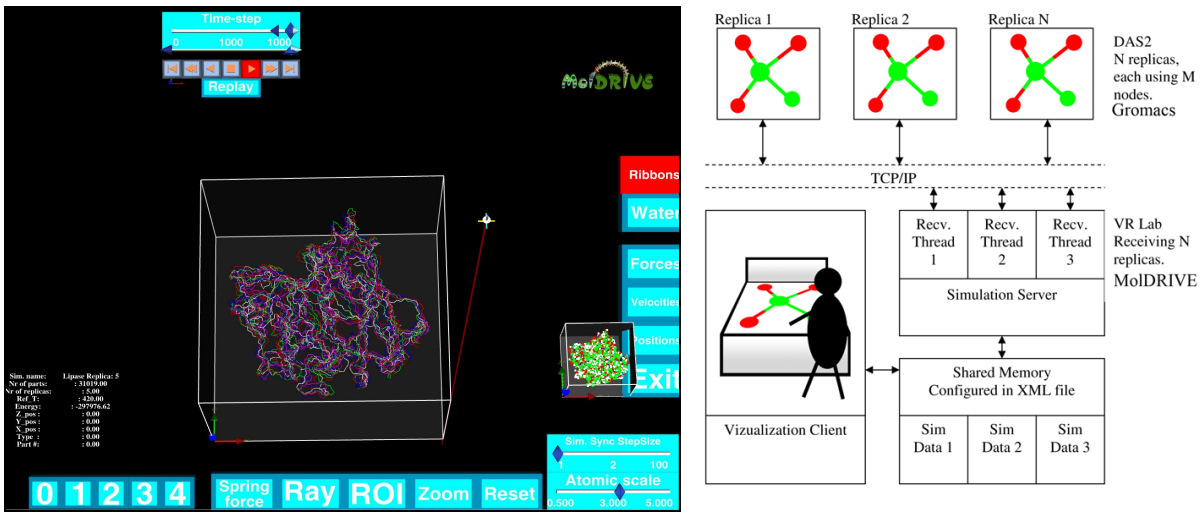
iVR library provides an abstraction on top of the following existing packages:

- OpenGL, a low-level graphics API
- OpenGL Performer, a scene-graph library for creation of interactive graphics applications
- VTK, visualisation toolkit for the creation of a data visualisation/processing pipeline.

Among the core functionality of iVR library belongs:

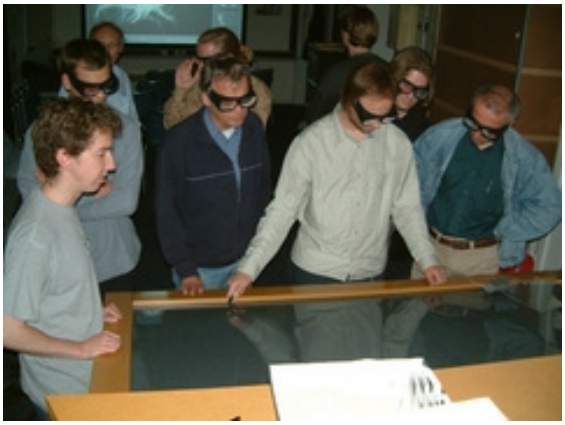
- Tracking and 3D interaction devices support, ready-to-use coupling with tracking devices (via VRPN)
- View setup, head-tracked & correct perspective view
- 3D interaction, a interaction mechanism to interact with virtual objects
- Windows and 3D widgets, hybrid 3D interfaces
- Desktop emulation and VR simulator option for VR session playback

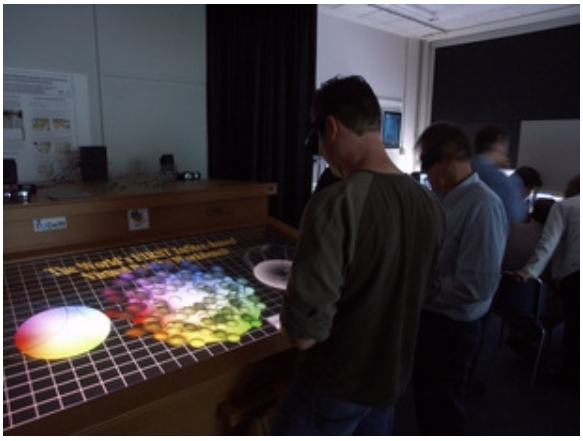
We have studied using the GRID / DAS2 for **interactive molecular dynamics simulations** (protein and enzyme studies) connected to the VR lab visualization machines, where the interactive visualization and simulation steering took place.



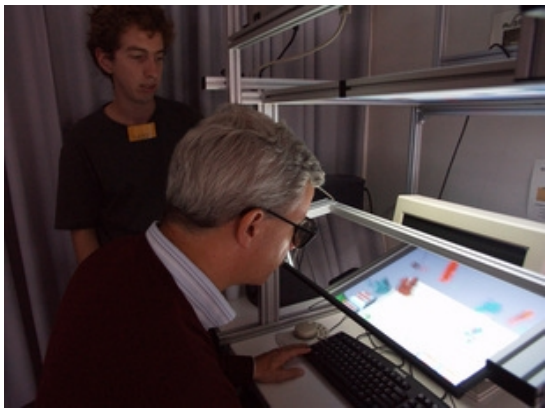
VR Lab TU Delft: Replica exchange molecular dynamics (REMD) simulation on the GRID/DAS2; visualization and interaction on the VR system

The VR Lab at TU Delft has been made available for external research partners on a cooperative basis with our group. A pilot research project in 2005/2006 has demonstrated that interactive use of grid and virtual reality can provide a beneficial environment for a group of scientific applications.





VR Lab TU Delft: Virtual Workbench



VR Lab TU Delft: (Low-cost) Desktop VR system

VR Lab TU Delft: Virtual Power Wall