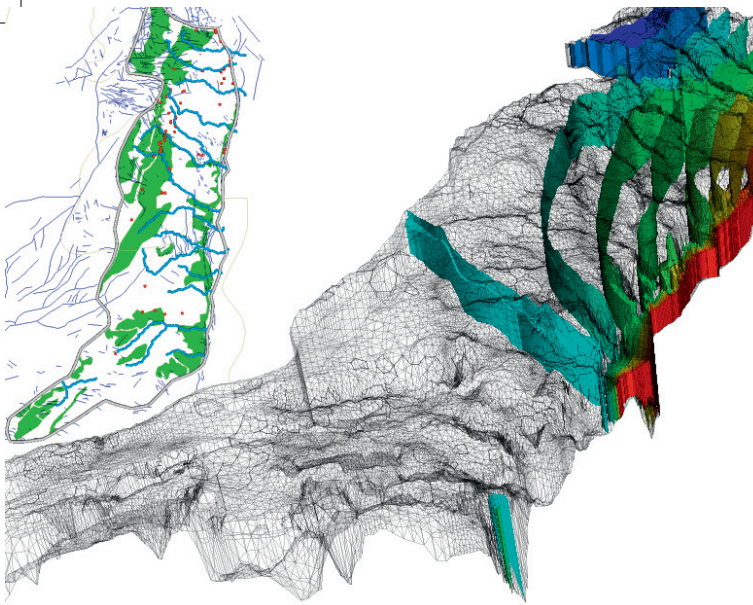




OpenGeoSys Project

Process Simulation

OpenGeoSys (OGS) is a scientific open-source initiative for the numerical simulation of thermo-hydro-mechanical-chemical processes. The basic concept is to provide a flexible numerical framework for solving multi-field problems in porous and fractured media for applications in hydrology, geoscience and energy.

Data Exploration

The OGS Data Explorer is a framework for integration and visualisation of heterogeneous data sets in a user-controlled 3D space. It supports the concurrent display of geoscientific input data, structural models and numerical simulation results. Apart from the construction of models for the OGS simulation software, it is also an easy-to-use means for the generation of data sets to be presented in the UFZ Visualisation Centre.

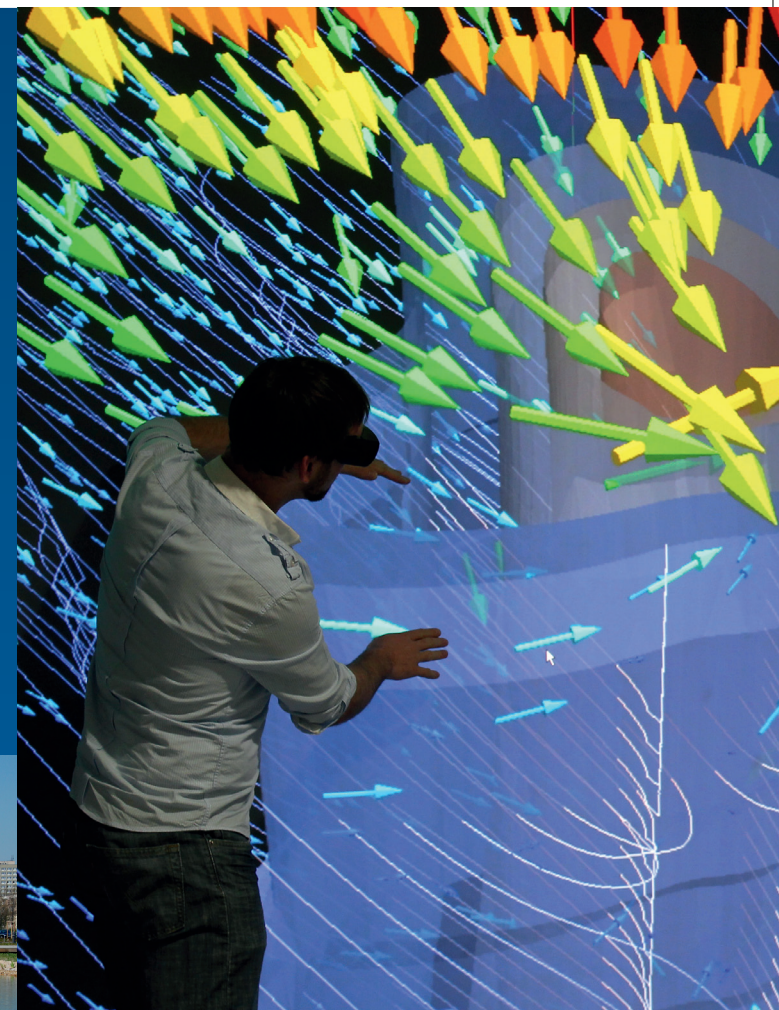
www.opengeosys.net

Directions



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TESSIN VISLab

Visualisation of Terrestrial Environments

 **HELMHOLTZ**
 CENTRE FOR
 ENVIRONMENTAL
 RESEARCH – UFZ



Hydrology & Climate

Today, environmental research often involves computational modelling of complex, interrelated systems of which we have only a rudimentary understanding. 3D visualisation in hydrology and climate research enables a better insight, interpretation and analysis of heterogeneous data from different sources at multiple spatial and temporal scales in a geographic context.

Scientific Visualisation

The UFZ provides the opportunity for interdisciplinary research between scientists from all over the world. An important aspect for a better understanding and a successful collaboration is a meaningful visualisation of complex datasets and phenomena. This is a basis for productive discussions and the development of new approaches for solving a given problem. It is also an important means to present research results to stakeholders or to the public. Adequate visualisation techniques such as the integration of heterogeneous data or the animation of iterative processes are essential for understanding natural phenomena and making important decisions. Typical presentations include – but are not limited to – the visualisation of complex hydrological or geological processes, simulations of climate change scenarios or developments in biodiversity as well as socio-economic problems.

Landscape & Biodiversity

Many human actions have an obvious impact on the landscapes surrounding us. Virtual reality (VR) is an appropriate tool for the assessment and the communication of those anticipated land use changes, e.g. to decision makers and to the public. Applications include the use of VR methods for wind park planning and for studying the effects of ecosystem functions in forests.

Visualization Center

The TESSIN VISLab uses a back projection-based stereoscopic visualisation environment with a 6x3 metre large main screen and corresponding projections on the floor and two side wings. The resolution of approximately 6400 x 1800 pixels is achieved by a system of 13 projectors. An optical tracking system compensates for the movement of an observer and a pointer device allows for interaction with the virtual environment. The VISLab can also be employed for enhanced multimedia presentations such as simultaneous display of images, videos and documents.

Geotechnics & Energy

Geoscientific studies are associated with the analysis of complex subsurface structures to be comprised of different geological elements. In addition, coupled thermal, hydraulic, mechanical and chemical processes under extreme environmental conditions have to be considered. 3D visualisation significantly fosters the clearness of structural models and computational results.

