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RESEARCH AND DEVELOPMENT

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Virtual Reality for Oil and Gas Industry

by Bernd Fröhlich and Martin Göbel

An International consortium has been established to demonstrate the impact of Virtual Reality in the Oil and Gas industry. This effort involves the development of prototype Virtual Reality applications specific to Oil and Gas activities.

The Virtual Reality applications will enable consortia members in Oil and Gas industry to evaluate how working in Virtual Environments can most effectively be used in Oil and Gas industry. Consortia members are Arco, Amoco, BHP, EXXON, Landmark, Mobil, Saga, Schlumberger, Shell, Smedvig, and Statoil. These members represent both Oil and Gas companies and the software developers of Oil and Gas applications.

The consortium has selected the Virtual Environment Technology Lab of the University of Houston as the American research and development partner and GMD as the European Research and Development partner. Silicon Graphics is supporting this consortium. Both research partners have many years of experience operating projection based virtual environments such as the CAVE (CAVE Automatic Virtual Environment), a four side room size rear projection system and Responsive Workbenches table type rear projection systems using high end SGI Onyx2s.

GMD and the University of Houston will develop the demonstrator for visualization, sonification and interactive exploration within Virtual Environments. As a proof of concept the demonstrator will cover aspects like device independence, intuitive interaction with geoscience data, telecommunication, distributed and collaborative visualization as well as cross technology applications.

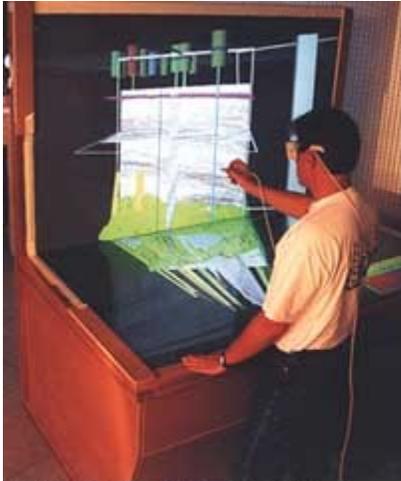
Goals

The overall goals of the demonstrator development are to apply and evaluate Virtual Environment technology for Reservoir discovery, characterization and management to enable multi-disciplinary collaboration, to generate synoptic views of data from multiple sources, and to support well planning by multi disciplinary teams.

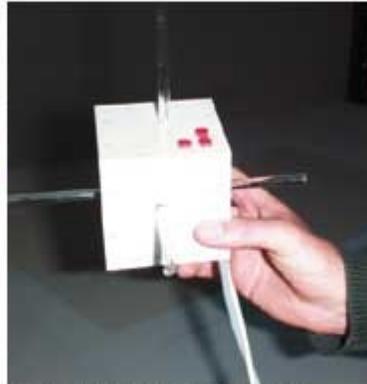
Status and Future Work at GMD

A first demonstrator is available since late 1998. Important features of our system are the visualization of multiple data types, support for well planning, combined visualization and sonification of well log data, and multi-resolution techniques. For navigation and interaction with

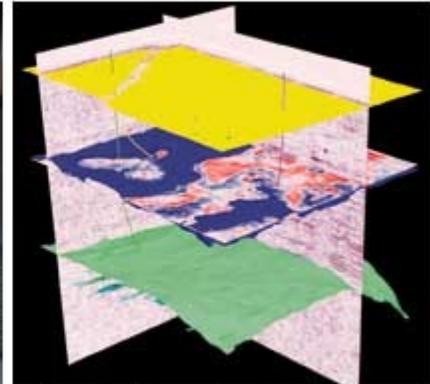
the system we engineered a new input device tailored to geo scientific data. This new device allows users to focus on their exploration task rather than on operating the computer.



GeoScience data on the 2-sided Responsive Workbench



The CUBE: A new input device for GeoScience applications.



Visualization of seismic data and horizons.

The highest priorities for the next two years are support for remote collaboration, exploration of other navigation tools and integration of SGI's Volumizer volume rendering a Application Program Interface. In particular, we are going to extend our current demonstrator to run under our distributed Avocado Virtual Reality system and we will support video conferencing capabilities within the distributed Virtual Environment application. Additionally we are looking into the integration of a large SensAble PHANToM force-feedback device to facilitate more intuitive interaction.

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