World Leading Virtual Reality and Visualization Centre Brings Data to Life

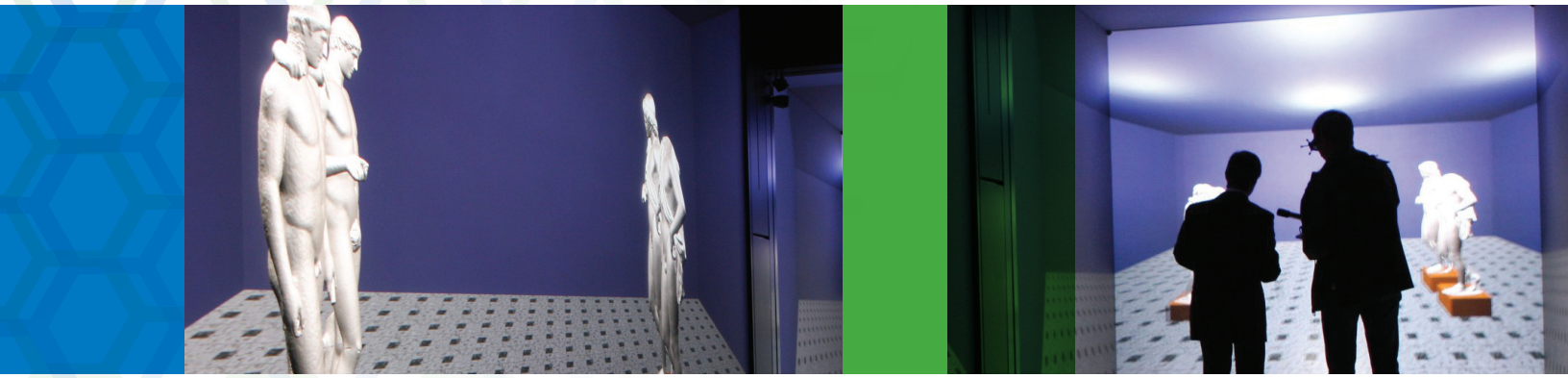
Capability and flexibility of SGI technology enables new insight and greater understanding of complex subject matter

Key Facts

Organization:
Leibniz Supercomputing Centre (LRZ)

Location:
Germany

Application:
Education & Scientific Research



Business Overview

The Leibniz Supercomputing Centre (Leibniz-Rechen-zentrum, LRZ), established in 1962, provides a range of sophisticated computing services to the academic and scientific community in Munich, Germany.

LRZ utilises the concept of "distributed, cooperative data processing" for the IT Services it provides. At its heart is a powerful communications infrastructure that connects decentralized systems and provides access to global networks. LRZ delivers general IT services to 100,000+ university customers in Munich and the Bavarian Academy of Sciences and Humanities (BAdW). It provides a powerful infrastructure (Munich Scientific Network) and competence centre for data communications networks; data archive and backup and a technical and scientific high performance Supercomputing Center (No.2 in Europe) available to all German universities and also to international clients.

Issues & Challenges

Virtual Reality (VR) and Visualization are closely aligned with VR describing the technology and visualization covering a range of applications that can use it. LRZ has been active in this field for over 10 years and demand has grown considerably from a mix of user groups and institutes working across a variety of fields and purposes. In all cases the desire from users has been to gain greater insight and understanding of their subjects. Ironically, the ever increasing data outputs were not actually helping – quite simply, they couldn't 'see' what the data was showing them.

LRZ took a strategic decision to increase its service capability by building a world class Centre for Virtual Reality and Visualization (V2C) in Munich. The specification was developed from research with existing users and with other Departments/ organisations that LRZ felt had not yet realised the value this technology could bring to their work.

The challenge was to build a centre that had the flexibility to deliver high performance on multiple operating systems and to accommodate the numerous and wide variety of specialist software applications different users utilise in their work.

SGI Solution

The SGI solution was a mix of technology and technical expertise. The processed data is transferred to the SGI high performance computing systems which turn it into visuals the user can see, literally 'walk around' and experience. SGI's technology has immense flexibility in that it runs both Windows and Linux operating systems with the same guaranteed high performance. In addition, SGI's Professional Services teams ensured that all the numerous and different applications – over thirty software packages - utilised by LRZ clients were fully configured and integrated into the system.

The V2C hosts a large scale, high resolution powerwall installation, as well as a 5-sided projection installation, both equipped with optical tracking. The powerwall can be used as a simple presentation medium and the 5 display panels can easily cover the field of view of the user and immerse them in the environment.

- SGI Altix UV10
- SGI Altix XE500, 12 nodes
- SGI Professional Services

Results & Benefits

SGI has enabled LRZ to implement its vision of being one of the largest and leading-edge Virtual Reality and Visualization centres in the world. The V2C is able to meet all the demands of its clients and whereas many centres only focus on the visualization of simulation results, the LRZ supports users of classical virtual application environments as well. Life sciences is a good example of the latter, with users from arts and humanities for perhaps the first time thinking in terms of how visualization can assist them in teaching and researching their subjects.

Since its first introduction, as part of LRZ's 50th anniversary celebrations in 2012, the LRZ has received very positive feedback – in many cases, clients did not realise the extent of the capability now available. The impact is considerable and the V2C is providing a new dimension to their work and enabling new insights and understanding.

For example, instead of seeing the tomb of Karaburun, Turkey on a flat screen, an archaeologist can now walk into it, thereby gaining a greater sense of what it was like when first built, approximately BC 475.

Quite literally, the data has come alive and the experience increases the users in-depth understanding of their subject, be it art, archaeology, industrial design, logistics, geo-engineering, zoology and, most recently, bio-informatics.

The LRZ and SGI partnership

SGI technology enables LRZ to support a very wide range of software applications and allows numerous academic and scientific functions to make full use of the V2C capabilities to meet a range of objectives.

The V2C is a major step forward in the services LRZ can deliver. Previously, it offered just VR technology which tries to immerse the user by providing highly interactive, real-time, stereoscopic images based on the users' viewpoint. In contrast, visualization technologies process simulation data, measured data or abstract data in order to make important information contained in the data more easily visible to the human eye using a high colour contrast range with high resolution to emphasise details.

The V2C hosts a large scale, high resolution powerwall installation, as well as a 5-sided projection installation, both equipped with optical tracking. The installations are set up in a room 12x12x11m with a raised floor at 5.2m. The lower part of the V2C contains the computing equipment, electricity and cooling infrastructure with the upper area used by visitors and users.

The powerwall is observed from a cinema-like area of 21 seats at 3 elevation levels and can be used as a simple presentation medium with its additional tracking capabilities enabling interactive visualizations. The 5 display panels can easily cover the users' field of view and immerse them in the projected images – the user feels completely immersed in the visualized environment

LRZ provides user support if additional expertise is required to help improve the visualization techniques, navigation and interaction with scenes the data has brought to life. In addition, the installations communicate directly with the supercomputer SuperMUC and with other systems worldwide, thereby facilitating the sharing of experiences and results.

"SGI technology has enabled us to bring the processed data to life and deliver a world-class V2C service to a wide range of clients in Germany and around the world."

Dr. techn. Christoph Anthes

SGI technology

SGI UV

SGI UV is the ideal platform to accelerate the pace of innovation in all areas of decision support, genomics and bioscience, chemistry and materials, physics, integrative systems science, national security, product design, and other data-intensive fields.

- World's Largest In-Memory System for Data-Intensive Problems
- Focus on Solving Your Problems, Not IT Problems
- No Limit Computing, Built on Industry Standards

SGI Professional Services.

SGI Professional Services consultants combine technology and innovation to produce advanced solutions to complex technical computing problems.

- Talent averaging 20+ years of experience
- Broad industry & technical computing know how
- Long-term commitment & quality focus
- A unified, trusted source of HPC expertise

About SGI

SGI, the trusted leader in technical computing, is focused on helping customers solve their most demanding business and technology challenges

Global Sales and Support: sgi.com/global