University of Tübingen

Wilhelm Schickard
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University of Tübingen
Graphical-Interactive Systems (WSI/GRIS)
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Core Competence

Photorealistic Rendering, Global Illumination, Real-time Rendering, Image Based Rendering, Parallel Rendering, 3D-Vision, Surface-Reconstruction, Segmentation, Scientific Visualisation, Volume Rendering, Virtual Medicine, Geometry Compression, Multi-Resolution Modeling, Occlusion Culling, Collision Detection, Cloth Simulation, Soft-Tissue Simulation, Graphics Hardware, Virtual Reality, Virtual and Augmented Environments, Multimedia-System for Graphics Education

Head of the Institute
Wolfgang Straßer

Staff

1 Professor: Wolfgang Straßer
8 Senior researcher: Dirk Bartz, Olaf Etzmuss, Stefan Gumhold, Günter Knittel, Ingmar Peter, Andreas Schilling, Stanislav Stoev, Markus Wacker
16 Research assistants: Rachida Amjoun, Peter Biber, Alexander Ehlert, Stefan Guthe, Frank Hanisch, Michael Hauth, Johannes Hirche, Urs Kanus, Michael Keckeisen, Stefan Kimmerle, Johannes Mezger, Angel del Rio, Zein Salah, Dirk Staneker, Michael Wand, Gregor Wetekam
1 Technician: Helga Mayer
2 Secretaries: Adelheit Ebert, Ursula Hieke

History

The chair for Computer Graphics at the University of Tuebingen (WSI/GRIS) has been founded in 1986 by Prof. Strasser. Since then about 30 PhDs have completed their work, six of them have become professors afterwards. Highlights of graphics research at WSI/GRIS have been in the areas of antialiasing, high performance graphics hardware architectures, anisotropic texture filtering (footprint-assembly), volume rendering systems, both software and hardware, textile modeling and simulation, multiresolution modeling and rendering, mesh compression, and multimedia systems for graphics in education. In 1986 Prof. Strasser started the successful series of SIGGRAPH/Eurographics Graphics Hardware Workshops. Prof. Strasser is a fellow of the Eurographics Association.

Rooms and Locations

The institute occupies some 600 square meters and is located in the third floor of one of the computer science department buildings. This includes a seminar room, three computer graphic labs and special lab for virtual reality research.

Financing

GRIS has 5 permanent research positions paid by the government, in other words 75 % of the research staff is supported by grants from government and industry.

Current Structure and Important Partners

GRIS has a very flexible structure and adapts

permanently to the needs of the research projects.

Current Research

The major avenues of current research activities at GRIS can be grouped into the areas Rendering, Virtual Environments, Modeling, Simulation, Scientific Visualization and Graphics Hardware. The rendering projects aim at real time adaptive rendering of huge scenes. The developed methods include polygonal based, point based and image based approaches as well as acceleration techniques including occlusion culling and hierarchical sampling. Within our virtual reality lab we develop application specific virtual environments for the interaction with cultural heritage, the simulation of virtual surgery and custom tailored cloth design. Our modeling approaches are targeted for storage space efficient representations of surfaces and volumes with hierarchical access. Scientific Visualization is another important direction of our research. We develop new visualization techniques adapted to the needs of collaborating physicists such as direct rendering of scattered data, photon traces and real-time volume rendering with high quality attributes from a compressed representation. In the simulation domain we aim at bringing cloth simulation into the consumer market by providing tools for virtual try on via a web interface based on a real 3D scan of the body of the consumer. Together with physicians we develop a realistic real-time system for soft tissue simulations in order to facilitate virtual surgery. Last but not least we design and realize special purpose volume rendering hardware based on off-the-shelf components resulting in higher frame rates and a variety of new features not available on standard graphics accelerators.

Important Recent Project Participations

- "Davis", "VIZARD II", "UltraVis", "TFB 20" of Sfb382, +DFG-funded projects, www.uni-tuebingen.de/uni/opx/index.html
- "MoViTex", DFG-funded project, www.gris.uni-tuebingen.de/projects/physsim/index.html
- "OpenSG", BMBF-funded project
- "Prometheus", BMBF-funded project
- "VIVENDI", DFG-funded project
- "Kelvin", HP-funded project, www.gris.uni-tuebingen.de/kelvin/
- "Virtual Try-On", BMBF-funded project, www.virtualtryon.de/
- "OMI-View" funded by EC
- "InReal" part of V3D2, DFG-funded project
- "DynCT" funded by EC

Important Recent Industrial Partners

ATI, AT&T, CAPTEC, DaimlerChrysler, Dt. Telekom AG, egisys, HP Labs, IBM, Lucent Technologies, MERL, nVIDIA, Philips, Pytha, RIDI, S3, Siemens, Thomson, Volkswagen
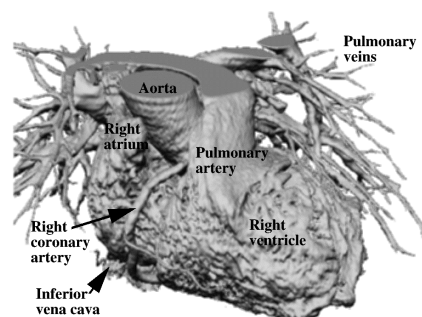
Future of the Lab

GRIS will continue the current research activities and strengthen in addition the research in Man-Machine-Interfaces.