Czech Technical University in Prague

Computer Graphics Group
Czech Technical University in Prague
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Core Competence

Spatial Data Structures, Global Illumination, Real-time Rendering, Visibility Algorithms, Scientific Visualisation, Information Visualisation, Virtual Reality, Multi-user Distributed Virtual Reality, CAD systems, User Interfaces.

Head of the Group
Jiri Zara

History

Computer Graphics activities started at CTU in Prague at the end of sixties. They mainly concerned implementation of graphical systems of various kinds. Computer graphics group was the organizer of the first computer graphics conference in Czechoslovakia in 1974. The research has been accompanied later on by starting computer graphics education in relatively large scale in the mid of eighties. In the same time first international contacts with computer graphics groups abroad have been established. The international coperation has been intensified from the beginning of nineties what resulted in participation and organization of various computer graphics events like Eurographics workshops etc.

Staff

4 Associate professors: Bohuslav Hudec, Ivan Jelinek, Pavel Slavik, Jiri Zara

2 Assistant professors: Roman Berka, Jaroslav Sloup
2 Research assistants: Jiri Bittner, Vladimir Stepan
1 Technician: Martin Brachtl
16 PhD students

Rooms and Locations

The CGG group is an integral part of the Department of Computer Science & Engineering. Within the Department, the group occupies 4 office rooms, two laboratories (Computer Graphics lab, Multimedia lab) and one computer classroom.

Financing

As a part of the Czech Technical University, CGG group is principally financed by the Czech Ministry of Education. Further, but minor resources include funds by Czech Grant Agency (GACR), Grant agency of Ministry of Education, Grant Agency of Czech Technical University in Prague, and EU projects.

Current Structure and Important Partners

The CGG is one of eight research groups of the Dept. of Comp. Sci. & Eng. The research areas are naturally arranged by the scientific interest of professors - Ivan Jelinek (CAD), Pavel Slavik (Visualisation, User Interface, Mobile Computing), and Jiri Zara (Virtual Reality, Rendering). A successful cooperation based on EU projects has been established with another research group at Czech Technical University - the Center for Machine Perception headed by prof. Vaclav Hlavac. Intensive contacts are held with all CG groups in the Czech Republic, Slovakia, Germany, and Austria.

Current Research

Current research is concentrated on visualization, virtual reality and user interface topics. Applications of virtual reality are of two kinds: creation of models of historical parts of Prague, and multi-user communication in VR environment. Several applications ranging from virtual reality training system for yacht captains up to virtual cultural centre have been designed and implemented. Visualization activities are concentrated on medical visualization, information visualization and visualization of technological processes. There have been several applications developed used both in industry and in educational process at university. Increasing importance have gained activities in the field of user interfaces. They are mostly of two kinds: interfaces for users with special needs and interfaces for specific applications like mobile computing (especially the problems of visualization in mobile computing environment are of increasing importance). The above mentioned research is application oriented. Besides this research also theoretical research has been conducted. The stress has been put on development of new rendering methods in complex environments. A new direction in this field are methods based on rendering optimization related to human perception properties. Concurrently new and efficient methods for fast rendering are investigated, especially for ray-casting and visibility preprocessing.

Important Recent Project Participations

- "VIRTUOS", Virtual Reality and Multimedia for SMEs, 1998 - 2000, Program COPERNICUS a "INCO-COPERNICUS" (EU 4th Framework Programme)
- "ENORASI", Virtual Environment for the training of Visually Impaired, 2001, EU 5th Framework Programme

- "SNIMS", Support Network for Interactive Multi-Me15
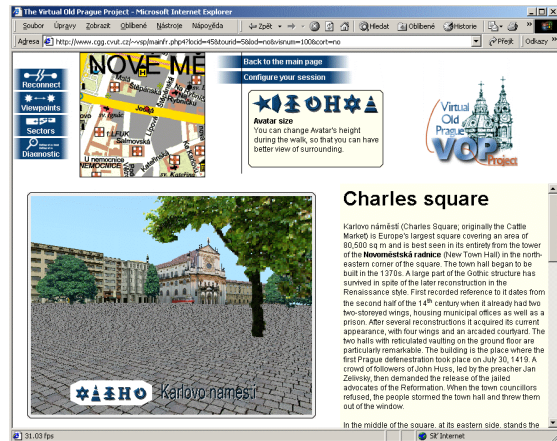
Important Recent Industrial Partners

Partners from the Czech Republic: ZPA, CKD Praha, Steel Works Frydek Mistek, Purkyne Military Medical Academy, Hospital Homolka in Prague, CEZ, Czech Gas Enterprise, Eveco Praha, Sazka, CIANT Prague.
Partners from abroad:
SIEMENS Germany, ANTEK Italy.

Future of the Lab

CGG will continue in prospective coooperations with current partners. The scope of cooperation is determined by the number of running projects (or projects in negotiation). Another aspect are the research topics of PhD students who are members of CGG. The most promising topics are: virtual reality, visualization, user interfaces, mobile computing, and multimedia. There are also links to other topics under investigation in other research groups at CTU like computer vision, telematics, digital archiving etc. The group is intensively searching for project partners in above named areas (especially for partners in the framework of EU projects). A special importance is paid to computer graphics education (development of new courses and application of new methods in computer graphics teaching).