DFKI German Research Centre for AI

Institute for Intelligent Visualisation and Simulation Systems (IVS)
DFKI German Research Centre for AI
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Core Competence

Human Modelling, Medical Computer Science, Scientific Visualisation, (Mobile) Information Visualisation, Virtual Reality, Augmented Reality, Artificial Intelligence

Head of the Institute
Hans Hagen

History

DFKI is an internationally recognized centre of excellence in Artificial Intelligence research. DFKI was established in 1988 and is one of the largest non-profit contract research institutes in the field of innovative software technology based on Artificial Intelligence methods. Since 1999 IVS is part of the DFKI. Right from the start, IVS took an important role in national and European research projects like the BMBF-Project "Virtual Reality Visualisation System (VRV)" or the EU-Project "AIT-VePOP" in close Cooperation with several European partners.

Staff

1 Professor: Hans Hagen
10 Researchers: Jan-Thies Bähr, Henning Barthel, Martin Hering-Bertram, Peter Dannenmann, Achim Ebert, Ingo Ginkel, Ralf Klein, Rolf Hendrik van Lengen, Gerd Reis, Maja Ruby, Dr. Dirk Zeckzer
1 Software-engineer: Heike Schmelcher
15 Research assistants

Rooms and Locations

IVS occupies 12 rooms in the DFKI building 57 in Kaiserslautern. In addition, office rooms of our industrial project partners and also several rooms of the informatics department building of the University Kaiserslautern are used.

Financing

The staff and most special equipment are financed by projects founded by the Federal Ministry of Education and Research (BMBF), the European Community, the foundation Rheinland-Pfalz for innovation as well as industrial partners.

Current Structure and Important Partners

DFKI conducts research in Intelligent Interfaces, Information Management, and Intelligent Cooperation Systems. The IVS is one of 5 research departments of the DFKI and is organized in three work areas: Human Factors, Medical Computer Science and Visualization Techniques. IVS cooperates closely with the study group Computer graphics and Geometric modelling of the University of Kaiserslautern as well as with numerous international partners (e.g. tecmath, ProCAEss, BMW, Univeristy of California, Mississippi State University etc.)

Current Research

The Intelligent Visualisation and Simulation Systems (IVS) department within DFKI focuses on solutions to man-machine communication and human related information exchange problems. IVS's goal is to develop intelligent methods

and tools for visualisation and simulation of complex, abstract, and heterogeneous data. To this purpose it has built up profound knowledge in scientific and information visualisation techniques. The projects listed below can at best considered a respresentative sample of our current research: "CONTACT"- The objective of this research is to develop a working platform for future autonomous characters, where users could define high level goals, and virtual characters would determine appropriate actions based on specific domain knowledge and AI techniques. "VES" - The objective of the "Virtual Echocardiography Project" is the research and development of innovative techniques and solutions for the achievement of a virtual examination environment for educational purpose in echocardiography. "DIET" - The project will involve the theoretical study, implementation and validation of a novel information management framework which will use ecosystem metaphors to turn the global information infrastructure into an open, adaptive, scalable and stable environment for service provision. Initially this will involve the design of an overall framework in which infohabitants - entities which can process information - can interact and coexist in societies set in an information environment. The framework will permit a focus on emergent properties, flexible interactions, daptation and self-organisation. "Virtual Try-On" deals with the effective coverage of the business segment tailor-made suit under the boundary condition of affordability for the average consumer. IVS's task is the development of an interactive individual clothing catalog, particularly consisting of the development of a new intelligent 3D morphing technique which has essential features concerning cloth morphing as its major field of application. "VRV" - The goal of VRV is the conception and development of a modern, object-oriented visualization system based on scientific visualization, multimedia and VR techniques. The development is made in compliance with certain criteria like modularity, platform independence, interactive behavior and automatic adjustment to computer performance.

Important Recent Industrial Partners

Aerospatiale Matra CCR, DaimlerChrysler Aerospace Airbus GmbH, Flowmaster International Ltd., Conservatoire National des Arts et Métiers, Astrium GmbH Space Infrastructure, Westpfalz-Klinikum GmbH, tecmath AG, ProCAEss GmbH, BMW

Important Recent Project Participations

- "AIT-Vepop", EU-IST project ait-vepop.oulu.fi
- "CONTACT", BMBF project, www.dfki.unikl.de/IVS/IVSEnglisch/Projects/contact.html
- "DIET", EU-IST project, www.dfki.de/diet
- "VES", BMBF project, pc-200.dfki.uni-kl.de:8080/VES/public/index.html
- "VirtualTry-On", BMBF project, www.virtualtryon.de
- "VRV", BMBF project
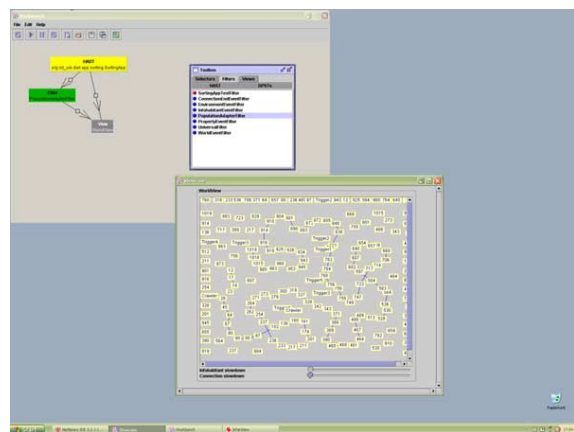
Future of the Lab

Scientific Visualization is currently a very active and vital area of research, teaching and development. The success of Scientific Visualization is mainly due to the soundness of the basic premise behind it, that is, the basic idea of using computer generated pictures to gain information and understanding from data(geometry) and relationships(topology). This is an extremely intuitive and very important concept which is having a profound and wide spread impact on the methodology of science and engineering. Scientific Visualization is a new approach in the area of simulation. It allows researchers to observe the results of simulations using complex graphical representations. Since vision dominates our sensory input, strong efforts are necessary to bring the power of mathematical abstraction and modelling to our eyes through the mediation of computer graphics. This interplay between various application areas and their specific problem solving visualization techniques is one of the most important future research topics.