FRANCE Rennes

IRISA-SIAMES

SIAMES Research Project
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Core Competence

Virtual Reality, Animation, Simulation, Autonomous Characters, Virtual Humans, Scenario Authoring, Photorealistic Rendering, Global Illumination, Virtual and Augmented Environments.

Head of the Project
Bruno Arnaldi

History

Computer Graphics activities started in the middle of 80's initiated by Gerard Hegron. From these a research project has been defined in 1989.
About 40 PhD's have completed their work since then. The first Virtual Reality Center in the academic field in France has been set up in our lab in 1999. In 2000 we were the initiator of the Perf-RV Research Program, funded by the french Ministery of Research including more than twenty academic and industrial partners in the field of virtual reality (www.perfrv.org).

Financing

As one of the twenty research projects of IRISA (partnership between INRIA, the CNRS, the University of Rennes 1 and INSA Rennes), the basic staff, the rooms and other infrastructure are financed in different ways by the french government. Most research engineers and part of the PhD students, as well as part of special equipments are paid from

projects funded by the EU, french national research programs or private companies.

Rooms and Locations

The research Project occupies one floor and half of one of the five buildings of IRISA. This includes one special lab for virtual reality research.

Staff

3 Professors: Bruno Arnaldi, Kadi Bouatouch, Yves Bekkers
1 Assistant professor: Thierry Duval
2 Research scientists: Stephane Donikian, Georges Dumont
1 Research engineer: Alain Chauffaut
1 Post-Doc: David Margery
9 PhD students: Nicolas Courty, Chadi El Zammar, Fabrice Lamarche, Caroline Larboulette, Jean-Eudes Marvie, Stephane Menardais, Tanguy Meyer, Nicolas Molet, Romain Thomas
12 Engineers: Guillermo Andrade, Guillaume Bataille, Gerald Choqueux, Frantz Degrigny, Frederic Devillers, Olivier Filangi, Claudie Fourn, Thierry Jouin, Christian Letenier, Mickael Rouille, Armel Cretual, Mathilde Vandenberghe
1 Secretary: Evelyne Livache

Current Structure and Important Partners

The SIAMES Research Project is organized in three complementary work areas, one for rendering, photogrammetry and real-time navigation in very large 3D

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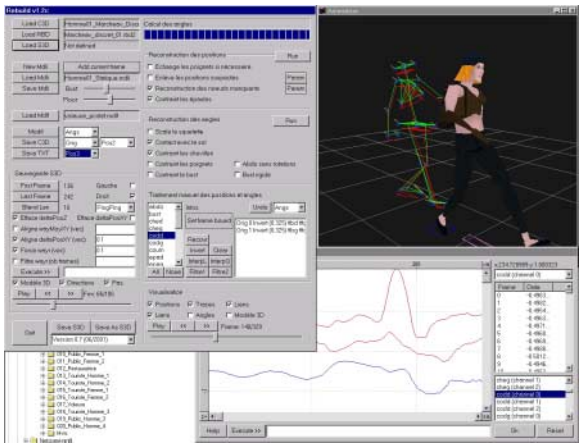
environments (Kadi Bouatouch), the second one in dynamics and virtual reality (Bruno Arnaldi) and the third one in behavioural animation, informed environments and scenario authoring (Stephane Donikian). Among others, they cooperate closely with LIMSI in Paris, LABRI in Bordeaux, INRIA Rocquencourt and the University of Iowa.

Current Research

One of the research activities concerns behavioural simulation of virtual humans evolving in complex and structured environments such as virtual cities. We are studying different aspects of an autonomous entity: geometry, dynamics, motion control, behaviour, artificial vision, scenario control. As a common modular programming and executing environment, we have developed a General Animation and Simulation Platform which is now available under an Open Source License (see http://www.openmask.org/). We have started to integrate all aspects of virtual humans by developping dedicated tools based on the research results in each of those fields. We are currently working on motion control and blending, behaviour coordination and planning, communication between agents, navigation of virtual humans including the management of cognitive maps, interactive drama and large scale inhabited environments. Another activity is concerned with global illumination, rendering and computer vision. Global illumination is studied for many years in our group. In particular, large environments are the main concern. Indeed, global illumination algorithms have been devised for simulating lighting in huge environments. These algorithms make use of new techniques for scene partitioning, visibility calculation, task ordering and parallelism. Special effects like glossy reflection has also been tackled. Another research activity is walkthrough in large environments through internet. To this end, a software framework has been developed. This framework relies on a client-server approach and makes use of different techniques such as: anticipation, scene partitioning, progressive textures, progressive meshes, impostures, etc. Computer vision has also been addressed. A modeler has been developed for reconstructing geometry and textures and recovering light sources. from one or more photographs. Our research activities in virtual reality concern three main topics: a VR software environment based on OpenMask, a general software architecture for force feedback treatment in cooperation with major french companies and a VR collaborative work using high speed network.

Important Recent Project Participations

- "DIATS, EU DGVII" - Road funded project
- "OpenISE", EU-IST Project
- "Perf-RV", French Ministery of Research funded project, www.perfrv.org
- "DraMachina", French Ministery of Industry funded project
- "DynamiCity", French Ministery of Industry funded project



Important Recent Industrial Partners

France Telecom R&D, GIAT Industry, IWI, Dramaera, Cryo, Infogrames, CEA, Renault, CSTB.

The Future of the Lab

The team will continue close cooperation with its current academic and industrial partners. We will continue to explore jointly virtual reality and virtual environments which means how to interact with such environments and who interact with. Interactive drama is one of the most complete environment to test and validate most of research activities done in the team, as it is combining interaction, contents and narration. The use of virtual reality for education and training purpose is also actively studied.