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 Ministry 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
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
developing 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 Ministry of Research funded
  project, www.perfrv.org
- “DraMachina”, French Ministry of Industry
  funded project
- “DynamiCity”, French Ministry 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.