University of Geneva

MIRAlab
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Core Competence

Virtual Reality, Virtual and Augmented inhabited Environments, Virtual Heritage, Human body modelling, Hair simulation, Virtual clothing, Direct communication between real and virtual humans, Speech, emotions and facial expressions, Physics-based deformable models, Biomechanical models, Medical informatics, Web 3D

Head of the Institute
Nadia Magnenat-Thalmann

History

The MIRALab research group is part of the Computer Science Centre at the University of Geneva. It was founded in 1989 by Nadia Magnenat-Thalmann. Professor Nadia Magnenat Thalmann has pioneered research into virtual humans over the last 20 years, participating in and demonstrating some of the most spectacular state-of- the-art developments in the field, and is responsible for the rigorous and intensive academic research programs that made them possible. A key objective of the lab is to assemble researchers from several disciplines (computer science and electrical engineering, physics and mathematics, networking and multimedia, architecture and design, psychology, videoart, etc.) and to forge links between them in a broad effort to understand human functionality and to simulate it in a realistic way.

Staff

1 Professor: Nadia Magnenat-Thalmann
6 Senior research assistants and PostDocs: Neeharika Adabala, Guangzheng Fei, Laurent Moccozet, Tom Molet, Pascal Volino, Mohamad Mohamadi-Rad (MD)
25 Research assistants and PhD students: Marlene Arevalo-Poizat, Anna Barseghian, Nedjma Cadi-Yazli, Frederic Cordier, Prithweesh De, Arjan Egges, Nicholas Erdos, Alessandro Foni, Stephane Garchery, Ignasi Giro, Rajeev Gupta, Sunil Hadap, Chris Joslin, MyungJin Kang, Sumedha Kshirsagar, Grégoire L'Hoste, Christiane Luible, Georgios Papagiannakis, Dimitrios Protopsaltou, HyeWon Seo, Yi Wu, Lydia Yahia Cherif, Xuan Zhang
1 Administrative assistant: Lucia Monnin

Rooms and Locations

The laboratory is located in the building UNI-DUFOUR. It occupies around 15 offices for the staff, 1 laboratory for students and 2 special rooms, for motion capture and for virtual reality.

Financing

MIRALab is funded largely through its intensive participation in several European projects as well as its collaborations with the private sector. Much of the fundamental research is supported as part of the Swiss National Research Projects. The basic infrastructure as well as the teaching staff is funded by the University of Geneva.

MIRALab
Where research means creativity

Current Structure and Important Partners

The MIRALab research group is made up of approximately 30 researchers, 6 senior researchers and some 22 MSc students in the field of virtual humans and virtual worlds. MIRAlab is involved in many national and international projects and collaborates with most of the key research and industrial partners in Europe and in the world.

Current Research

The general research areas at MIRALab include the design of networked virtual worlds, real-time recognition of emotions and interactive reactions of virtual humans through emotional models, rapid photograph-based cloning techniques which allow simulation of facial expressions, and direct communication between real and virtual humans using speech, emotions and facial expressions. The group also specializes in the simulation of physics-based deformable models such as clothing and hair, with applications to dressing virtual models and to fashion shows. Other work focuses on biomechanical models in the simulation of wrinkles and the aging process. MIRALab is also actively involved in the definition of standards such as MPEG-4 and has provided the key test software for the MPEG-4 SNHC sub-committee. Approximately one fourth of our research is dedicated to medical informatics, including topological models for the reconstruction of muscles, bones and skin, as well as simulation processes.
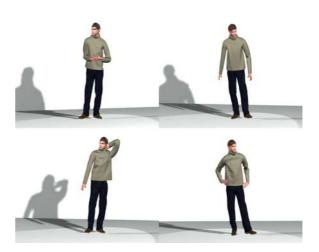

Important Recent Project Participations

- E-TAILOR: Integration of 3D Body Measurement, Advanced CAD and E-Commerce Technologies in The European Fashion Industry / IST-1999-10549
- STAR: Services and Training Through Augmented Reality / IST-2000-28764
- CO-ME:The Computer Aided and Image Guided Medical Interventions /Swiss National Center of Competence in Research

- INTERFACE: Multimodal Analysis/Synthesis System for Human Interaction to Virtual and Augmented Environnments / IST-1999-10036
- VIRTUAL: Virtual reality systems for perceived ergonomic quality testing of driving task and design / G2RD-1999-11030

Important Recent Industrial Partners

L'OREAL (UK), UNILEVER (UK), SIEMENS (Germany), France Telecom (France), Investronica (Spain), Elan Informatique (France), Duran Dubois (France), Matra Nortel Communication (France), FIAT CRF (Italy)

Future of the Lab

MIRALab is continuously investing efforts in exploring novel ideas and axis of research with respect to its general focus in Virtual Humans and Virtual Worlds. It is actively strengthening its current national and international research collaborations and developing new ones. MIRALab is particularly interested in further stimulating the development of the interdisciplinary research and open new avenues of applications for Virtual Worlds.