

# Virtual Humans For Rehabilitation

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## Description:

This workshop will explain the latest techniques to model and animate individualized virtual humans for Virtual Rehabilitation applications. The workshop will emphasize both types of rehabilitation: physical and mental. For physical rehabilitation, we will focus on creating multi-modal responsive and expressive interactive behavior for a virtual coach to assist the patients during a physical rehabilitation process. The virtual coach will adapt its behavior according to its internal state, the subject activities (e.g., gestures tracking, subject preferences, sensors measurements) and the environment. In the case of mental rehabilitation, we will focus on social phobia, where the patient is immersed with a group of Virtual Humans. In both cases, the interaction will be in terms of speech, facial expressions and gestures realized on a full body virtual human.

## Objectives:

1. To demonstrate and apply the latest techniques in virtual human creation for physical and mental rehabilitation
2. To distinguish between avatars and autonomous agents
3. To describe behavioral animation and interaction with virtual humans
4. To script a scenario with a virtual human

**Intended audience:** Clinical and technical specialists in rehabilitation



**Daniel Thalmann** is Professor and Director of The Virtual Reality Lab (VRlab) at EPFL, Switzerland. He is a pioneer in research on Virtual Humans. His current research interests include Real-time Virtual Humans in Virtual Reality, Networked Virtual Environments, Artificial Life, and Multimedia. Daniel Thalmann has been Professor at The University of Montreal. He is coeditor-in-chief of the Journal of Visualization and Computer Animation, and member of the editorial board of the Visual Computer and 3 other journals. Daniel Thalmann was Program Chair of several conferences including IEEE VR 2000. He has also organized 4 courses at SIGGRAPH on human animation. Daniel Thalmann was the initiator of the Eurographics working group on Animation and Simulation which he cochaired during more than 10 years. Daniel Thalmann has published more than 350 papers in Graphics, Animation, and Virtual Reality. He is coeditor of 30 books, and coauthor of several books including the recent books on "Crowd Simulation" and "Stepping into Virtual Reality", published by Springer. He received his PhD in Computer Science in 1977 from the University of Geneva and an Honorary Doctorate (Honoris Causa) from University Paul-Sabatier in Toulouse, France, in 2003.

**Nadia Magnenat-Thalmann** has pioneered research into Virtual Humans over the last 25 years. She obtained several Bachelor's and Master's degrees in various disciplines (Psychology, Biology and Chemistry) and a PhD in Quantum Physics from the University of Geneva. From 1977 to 1989, she was a Professor at the University of Montreal where she founded the research lab MIRALab. She moved to the University of Geneva in 1989, where she recreated the Swiss MIRALab, an internationally interdisciplinary lab composed of about 25 researchers. She is presently taking part in more than a dozen of European and National Swiss research projects. She has a long experience on simulating humans as she has worked on the early EU project Humanoid in 1993. Currently, she is working in the EU



project Leapfrog where everyone can be modelled and animated using a set of individual dimensions. She is the coordinator of the European Research training network Marie Curie "3D ANATOMICAL HUMANS" which goal is to provide anatomy-specific bodies. With her students, she has published more than 400 papers mostly on virtual humans (body, hair, clothes and on VR and AR as recreating life in Pompeii or touching textile for the project Haptex. She is editor-in-chief of the Visual Computer Journal published by Springer Verlag and co-editor-in-chief of the journal Computer Animation and Virtual Worlds published by Wiley. More can be seen at [www.miralab.unige.ch](http://www.miralab.unige.ch)