Interview with Professor Nadia Magnenat-Thalmann
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Q. You pioneered the modeling of realistic virtual humans, particularly by producing the first 3D simulation of Marilyn Monroe in the film Rear Window in Montreal (1987). What was your vision for Artificial Intelligence 30 years ago?

A. In the eighties, I was fascinated with creating a realistic “persona,” right down to its behaviour. At that time, Marilyn Monroe was very popular, so I chose to model her on that. The main difficulty at that time was to replicate her facial expressions and movements and to give the illusion that it was her. But it was only in the nineties that Artificial Intelligence (AI) was introduced to 3D characters. Before that, to test AI programs, we typed questions to get pre-defined, so-called “intelligent” answers from a screen.

Q. How can AI revolutionize the future? Do robots have social value?

A. There is a distinction between AI and Emotional Intelligence (EI).

AI is the logic process used to solve problems and sort out information to help us in our daily tasks.

For example, we can use it in our navigation systems that help us go where we need to go. The fact that I can talk to a phone or computer and receive useful answers is already a real progress. A very good application to have is to ask a virtual human, robot, computer screen or phone a question with specific criteria without sending keywords or opening a website as we do now with Google. Thanks to AI, we can now benefit from an interactive system that will answer most of our questions intelligently.

However, EI takes into consideration many other aspects than logic, and is used to interact naturally with humans by recognising and modelling various emotions, attitudes, motivations, etc. These processes are far more complex than AI.

Q. The most recent success in your Virtual Humans research is the social autonomous robot Nadine. What was the idea born and what was its purpose?

A. My dream has always been to have a virtual human companion or personal assistant to help me in any situation. That became possible in 2008 when I bought the social robot EVA in MIRLab in Switzerland. This robot had a very realistic head, but only a head. We have developed early research at MIRLab using this social robot that led to quite original publications.

Over the last two years, full humanoid robots appeared in Japan. They were guided by a human, but if we applied our experience and knowledge of virtual human technology, we thought we could make them autonomous, independent of humans, and socially skilled.

Three years ago, I bought such a robot from Japan and modelled it on myself.

Q. The robot is able to speak, remember actions, recognise people and gestures, and express mood and emotions. What other capabilities does it have?

A. She is also able to gauge as people and follow them when they move. She also looks very pleasant.

Q. Who are the specialists in your team? How would you describe the role of the Institute for Media Innovation at Nanyang Technological University (NTU) in Singapore, and that of the MIRLab Research Laboratory at the University of Geneva in the development of Nadine?

A. Nadine was entirely conceptualised and developed in NTU as the Institute for Media Innovation (IMI). Even though I had 30 years of knowledge in research on Virtual Humans, Nadine was more complex as she had a full body with arms and I wanted her to be able to express independent and natural emotions, not behave with pre-defined sentences or attitudes. Therefore, we did new research for recognising faces and gestures, and it led to the Virtual Human software being developed at NTU’s Institute of Media Innovation.

The specialists in my team are researchers from various fields. They include vision, 3D animation, computer graphics, robot hardware, 3D fabrication, AI emotion and social modelling.

Q. The social autonomous robot has almost your name and is very much an avatar of yourself. How much of Nadine’s personality will we find in Nadine, and why did you choose your alter ego? Is it linked with the preservation of your values eternally?

A. Since I started researching on Virtual Humans (VH), I was only interested in modelling realistic VHs. That also applied to robots. I asked myself how should I model a first-of-its-kind realistic robot? For a change, I chose a female robot. These social robots are intelligent professional companions that help us through dialogue and emotional interaction to handle different situations. Then I thought ‘why not model the social robot like me?’ At least, it allows me to compare her gestures and behaviour with mine. I see as the ground truth for Nadine, otherwise, with whom could I compare her specific behaviour and attitude?

Q. Which improvements do you expect from Nadine and when is the deadline? What is her lifespan?

A. Nadine is learning how to recognise objects and grasp them in a human way, and to understand what is the meaning of each object. We are working on understanding the real user’s hand gestures and Nadine’s hand grasping. We hope to achieve this as soon as possible.

Nadine has a lifespan of at least another three years. We are also improving the links between her memory and decisions. As of now, she repeats what she knows or has heard without filters.

Q. What are the weaknesses and limits of the robot?

A. For now, Nadine can only sit. We envisage her being able to stand. This means motors and actuators will have to be built into her legs so that, for example, she can stand next to someone and shake hands.

We also need to improve Nadine’s awareness. She can handle one person at a time, but in real life, we have multiple interactions. Like us, she should recognize the group and analyze group situations and behaviour.

She also needs to understand who is talking, what the person is saying, and when it is her turn to speak. This is a long-term research topic that researchers from various disciplines are investigating.

Q. Are you training Nadine to become a social care assistant. What actions will she be able to do, and will she compete with specialized social workers? Have you analysed the possibility of a technical backlash at a critical moment that could potentially put the people she is caring for in danger?