New avatars capable of laughing

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Today's computer-based avatars lack one of our most deeply rooted human characteristics: laughter. Computer scientists have now teamed up with psychologists to give avatars the ability to laugh.

Laughter research is no laughing matter at the Numediart Institute of the University of Mons, in Belgium. Members of this research institute are involved in an EU-funded project, called ILHAIRE, due to be completed in 2014. It aims at gaining a better understanding of laughter features in order to incorporate them in interactive systems. Stéphane Dupont, senior researcher at the circuit theory and signal processing laboratory of the Mons Polytechnic Faculty, who is also project coordinator, tells youris.com about how laughter makes virtual characters more realistic and changes how we interact with them.

Why should laughter be incorporated in virtual systems?

Laughter is very important in human interactions. It may occur up to three times per minute! In a conversation, laughter regulates the flow, brings some nuances, betrays a lack of confidence, or reveals feelings such as joy, amusement and irony. However, current voice-based interactive systems, such as those you may use to book a plane ticket, or avatars in serious games [games for learning purposes], for example, do not incorporate laughter. They are efficient in recognising neutral speech or providing realistic vocals synthesis. But they are not expressive. Incorporating laughter into these systems might lead to applications such as making the perception of a message more positive or managing the

frustration of users confronted to a problem during a reservation process.

How do scientists go about studying laughter?

They are many approaches. For example, we want to make a machine able to recognise human laughter and its characteristics. Future applications could feature a virtual companion, either on a screen or as a robot, who would help exploit the fact that laughter is contagious. They would thus be susceptible to enhance the enjoyment of a person watching a funny movie.

We have been working with a team of psychologists from the personality psychology and assessment section at the University of Zurich, in Switzerland, to assess the positive effects of these virtual agents on a person's mood. We also aim at synthesising laughter using algorithms in a very controlled way and to incorporate these algorithms in human-computer interaction systems. Among other topics, we have studied are so-called gelotophobia—the fear of being laughed at—and the positive effects of laughter to relieve chronic pains.

What does your experiments consist of?

For example, we fit our candidates with microphones, movement sensors and 3D cameras, and we show them a funny movie. We collect the data from which we build models mimicking physical effects of laughter. We incorporate these models into avatar programmes. Our avatars are then able to laugh while displaying realistic facial motion and gesture typical of real laughter.

What are your achievements to date?

We have built ten databases and related models corresponding to

different situations of laughter: watching a movie with a virtual companion, engaging in a three-person discussion, playing different games. These databases are freely accessible to the science community. Our laughter synthesis tools have found an application in virtual characters designed by Cantoche, a company based in France and the US, to meet the needs of companies in the fields of e-learning or customer assistance. Finally, we will pursue our collaboration with the Zurich team in order to learn more about the positive effects of laughter.

More information: www.ilhaire.eu/

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