Virtual Reality for Virtual Eternity

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Imagine having a discussion with Isaac Newton or Albert Einstein on the nature of the universe, where their 3-D, life-sized representations looked you in the eye, examined your body language, considered voice nuances and phraseology of your questions, then answered you in a way that is so real you would swear the images were alive.

This was an opening scene from an episode of the TV show "Star Trek" almost a decade and a half ago. A new research project between the University of Illinois at Chicago and the University of Central Florida in Orlando may soon make such imaginary conversations a reality.

Technology from computer games, animation and artificial intelligence provide the elements to make this happen. The National Science Foundation has awarded a half-million dollar, three-year grant to UIC and UCF researchers to bring those elements together and create the methodology for making such virtual figures commonplace.

UIC will focus on the computer graphics and interaction while UCF will concentrate on artificial intelligence and natural language processing software.

"The goal is to combine artificial intelligence with the latest advanced graphics and video game-type technology to enable us to create historical archives of people beyond what can be achieved using traditional technologies such as text, audio and video footage," said Jason Leigh, associate professor of computer science and director of UIC's Electronic Visualization Laboratory. Leigh is UIC's lead principal investigator.

EVL will build a state-of-the-art motion-capture studio to digitalize the image and movement of real people who will go on to live a virtual eternity in virtual reality. Knowledge will be archived into databases. Voices will be analyzed to create synthesized but natural-sounding "virtual" voices. Mannerisms will be studied and used in creating the 3-D virtual forms, known technically as avatars.

Leigh said his team hopes to create virtual people who respond with a high degree of recognition to different voices and the various ways questions are phrased.

"Imagine a computer smart enough to have the avatar respond 'Do you understand what I'm saying?' in the natural way humans communicate with each other," said Leigh. "We're trying to tip towards being as naturalistic as possible."

The project's test subject will be a senior NSF program manager known for his wealth of institutional knowledge. A UIC graduate student will shadow this official for several months making video and voice recordings. His presence will be digitally reconstructed and interviews used to glean his institutional insights will be stored in the information database. It will allow NSF personnel to consult his virtual counterpart whenever they want to tap his institutional wisdom.

Leigh sees a commercial market for preserving virtual people whose critical or unique knowledge is vital to operations of corporations and other institutions.

Faster, more powerful computers in the future will likely enhance the realism of these interactive avatars. How they will be used is limited only by one's imagination.

"What's interesting to us is how this works in cycles," said Leigh.

"Advanced graphics/simulation research resulted in today's gaming technology. A lot of the virtual reality techniques we now take for granted in game systems like Nintendo Wii or immersive environments like Second Life came out of labs like EVL. Now next generation gaming technology is stimulating new applications for advanced graphics/simulation research that can benefit gaming as well as other fields."

Source: University of Illinois at Chicago