

# Take a tour of the virtual future at Stanford

*Stanford's newly renovated Virtual Human Interaction Lab is now open for public tours.*

BY STEVE FYFFE

If you want to see what your living room is likely to look like four years from now, come and take a tour of Stanford's new Virtual Human Interaction Lab, says Jeremy Bailenson, an associate professor of communication and co-author of the book *Infinite Reality*.

"It's a high-tech vision of the future," Bailenson said.

"We're using this cutting-edge lab to try to think ahead by a few years to predict what household technology is going to be like and how that's going to affect people."

The lab reopened six months ago after a major renovation and is now offering tours to the general public most Fridays at 4 p.m.

The tours are popular, so you need to sign up early, warns Bailenson. If you miss out, you'll be put on a waiting list and notified when space is available.

"We spent a lot of time conceptualizing the experience," Bailenson said. "It's still called the Virtual Human Interaction Lab, but I guess you'd call us 2.0."

## Virtual reality 2.0

Even the waiting room has an eye toward the future, with a high-end lenticular 3-D TV set mounted on the wall, which allows visitors to see 3-D images without having to wear special glasses or helmets.

From the control room, Bailenson and his students monitor experimental participants and run the 25 computers that generate the virtual worlds they use to study how people behave in cyberspace.

"I'm primarily a social scientist, and what makes this space special is that it's specifically designed for psychological experimentation in virtual worlds," he said.

"We integrate three virtual senses in a way that's very psychologically persuasive – sight, sound and touch."

In the multisensory room, experimental subjects wear a head-mounted display with small screens placed close to each eye to mimic stereoscopic vision and create the illusion of virtual space. Each screen has a resolution of 1,280 by 1,024 pixels, and an overall field of view of almost 120 degrees.

The room also features a state-of-the-art ambisonic sound system, comprising 22 speakers, hidden behind panels in the wall.

"You can actually get sensitive movements of sound as it travels across the room. It greatly

Experimental participants see the virtual world through a head-mounted display, which uses high-resolution screens close to the eyes to mimic stereoscopic vision.

L.A. Cicero

adds to the experience of presence to have the sounds come from the visual location of virtual objects," he said.

Speakers mounted beneath the floor, made of special-order aeronautical grade steel, generate vibrations that shake the ground underfoot.

The CAVE room (Cave Automatic Virtual Environment) uses two commercial 65-inch 3-D TVs mounted in a corner to create the illusion of walking through space. Experimental participants wear 3-D glasses, with infrared lights attached to the rims. Cameras high on the walls monitor the position of the lights and constantly update the virtual scene based on their position.

## Groundbreaking research

Bailenson and his researchers have been on the cutting edge of virtual reality research since he founded the lab at Stanford in 2003 with one PhD student and an undergraduate programmer. Now the lab hosts 10 graduate students, more than 20 undergrads and a full-time lab manager.

"We're trying to really leverage the resources of the lab to do good for society," Bailenson said. "A lot of our studies now are geared toward putting people, everyday citizens, in situations that they wouldn't be in otherwise."

In one experiment, participants were asked to cut down a virtual tree with a device that vibrated in their hands to mimic a chainsaw. The researcher, doctoral student Grace Ahn, found that people were more likely to recycle paper – and save trees – after they cut down the virtual tree.

"We're embracing virtual reality as a way of letting people understand their impact on the environment with the goal of them actually changing that behavior," Bailenson said.

In other experiments, Bailenson and his team found that people are more likely to save for retirement if they are shown photos of themselves that have been altered to reflect how they might look in old age. And people are more likely to go to the gym and exercise if they're shown a 3-D avatar, or virtual representation of themselves, gaining weight.

Bailenson said that research in the new lab will focus on education, to encourage energy reduction and pro-environmental behavior, and to understand the implications of time spent online.

## Coming soon to a living room near you

His lab offers a glimpse of the future of household entertainment.

"Only in the last few years have we really been able to see the technology that we have in this science lab start to port to the living room," he said. "I truly believe that the amazing psychological experience of being transported to a virtual space that we do here at Stanford is going to be in most people's homes in the coming years."

And, he said, the study of virtual reality is more important than ever, especially with the rise in the popularity and sophistication of computer games.

"Children today are spending twice as much of their time playing video games as they are spending time reading print," he said.

"Understanding what an avatar is, representations of people, and the consequences of spending time in avatars – 15 years ago that was not an important question for the common person; today it actually is."

*To sign up for a public tour of the Virtual Human Interaction Lab, send an email request to [vhil-stanford@lists.stanford.edu](mailto:vhil-stanford@lists.stanford.edu).*



Sophomore Tina Roh experiences the virtual world that she helps to create as one of the lab programmers.