

Stanford's virtual reality experiments transport knowledge to new vistas

By Bruce Newman

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Even as it gained acceptance on college campuses during the 1990s, "virtual reality" could never quite escape having just a whiff of junk science. The graphics created for early virtual worlds were so clunky and slow they conjured up bad LSD trips. Giant helmets immersed subjects in fantastical environments far more virtual than real. It was like conducting a seance in a hat.

"Until five or six years ago," says Jeremy Bailenson, director of the Virtual Human Interaction Lab at Stanford, "when I told people what I did for a living, they laughed."

They're not laughing anymore. Stanford's small, but cutting-edge virtual reality lab is studying ways a digital world intersects with the real one in places as familiar to almost everyone as Facebook and Nintendo's Wii.

"Back in the early '90s, everyone thought that we would be sitting around in these crazy helmets, hooked up to all this stuff and never leaving our houses," says Jesse Fox, a doctoral candidate who manages the lab. "Like any fad, people thought the future was right around the corner, and then it

didn't happen. It was like walking around in Pong."

Even now, virtual reality sounds so '90s. "The joke among VR people," says Bailenson, "is that next year VR is going to be huge."

But the future finally is now. "Kids spend more time on Facebook than they do talking to physical people," adds Bailenson, who began studying virtual reality 14 years ago, before he got his doctorate in cognitive psychology from Northwestern. "The idea of interacting with a digital other, especially among the young, has become pervasive."

Whose face is that?

That's why the Stanford lab's facial-tracking research is being sponsored by the Japanese auto industry, and Bailenson now serves as a consultant to seven different branches of the United States government, including the military. Using computer-generated avatars to conduct "body swapping" experiments, Stanford's reality shape-shifters are studying whether they can make you lose weight, save for retirement, or, more insidiously, vote for a political candidate you didn't even know you supported.

In a study conducted one week before the 2004 presidential election, researchers presented prospective voters with pictures of George Bush and John Kerry. The photos had been subtly altered so that one candidate's picture always contained a morphed image of the voters themselves. Strong partisans weren't swayed by the doctored pictures, but those on the fence demonstrated a strong preference for the candidate who looked vaguely like them.

Bailenson acknowledges that virtual reality could become "the creepiest, most Orwellian thing" if it were used to subvert an election. "In this age where

everything we do is sensed by technology," he says, "there are great things you can do with it, and there are really scary things. It's just like uranium."

As computer graphics improved and the software became more powerful, complex algorithms permitted the lab to track a subject's facial movements and build models that predict his or her behavior. "If you move your face in certain directions, it's going to predict your performance, or the kind of person you are, or whether you're going to buy a certain product," says Maria Jabon, the lab's lead engineer.

'Big brotherly'

It's likely that corporations will try to take advantage of the Stanford lab's technological breakthroughs, says Sun Joo Ahn, a doctoral candidate in philosophy who is using virtual reality to study empathy. "You could go to a job interview, and the interviewer takes a look at your face, records it for a few minutes, then knows whether you're going to be a good or bad performer," she says. "It's very Big Brotherly."

Ahn's specialty is projecting people into virtual out-of-body experiences to see how it affects them as consumers. The Stanford lab has done numerous experiments proving that people who can watch their virtual selves gain weight as they eat chocolates — the thighs thicken and the belly bulges — are likelier to exercise or diet.

"In the past you had to use your



This series of images represent how a subtle change in the appearance of a candidate could influence the way a person chooses to vote, particularly if elements of the voter's own face were to appear in the image. Such research is among the many experiments being conducted in the realm of virtual reality at the Virtual Human Interaction Laboratory at Stanford University. Courtesy Virtual Human Interaction

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imagination to put yourself in somebody else's shoes," Ahn says. "Using the VR equipment, you can actually become that person and view the world through his eyes."

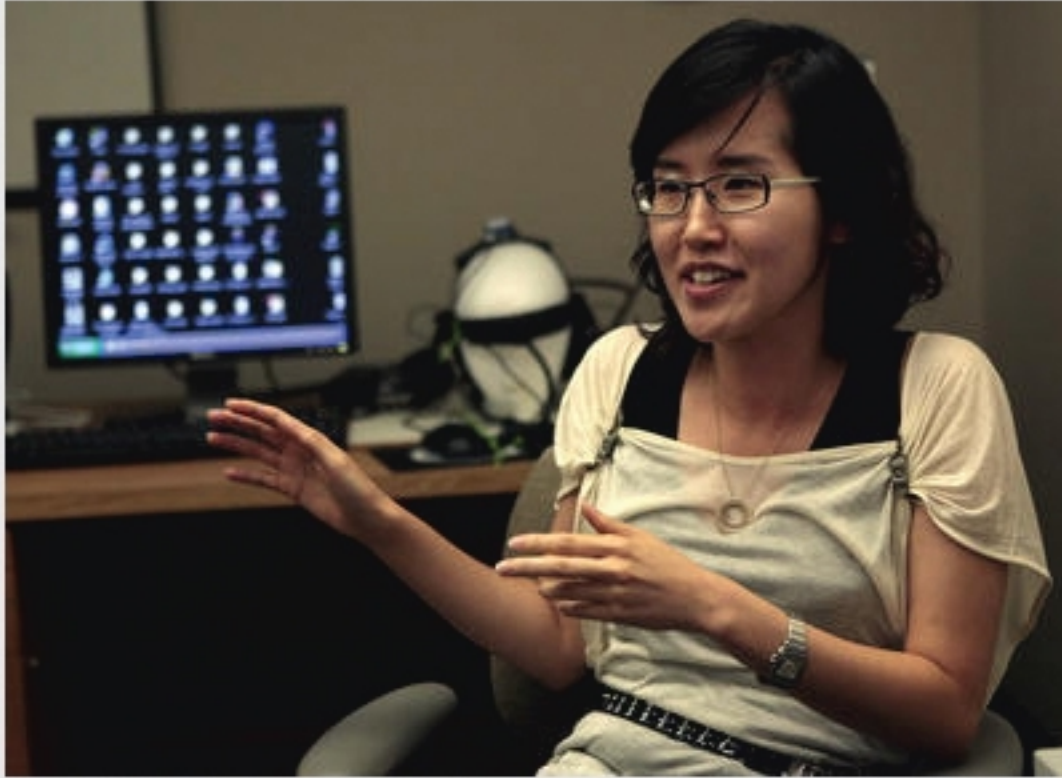
You can't actually become another person, of course, and one of the likely pitfalls of a virtual world is that its powerful imagery could blur the line between a manufactured reality and the real thing. Graduate student Kathryn Segovia conducted an experiment with 5- to 7-year-olds in which she showed the children images of their faces on virtual bodies, swimming with a pair of fish. Even though this had never happened, after watching their avatars on the lab's \$25,000 head-mounted display, many of the kids told Segovia that it had.

Segovia is studying legal psychology, and believes that image-rich media such as virtual reality lineups and virtual re-creations of crime scenes will one day be admissible in court. But she also worries that the technology could be used to create false memories in suggestible minds. "If this type of equipment were at your disposal, that's something that could definitely happen," she says.

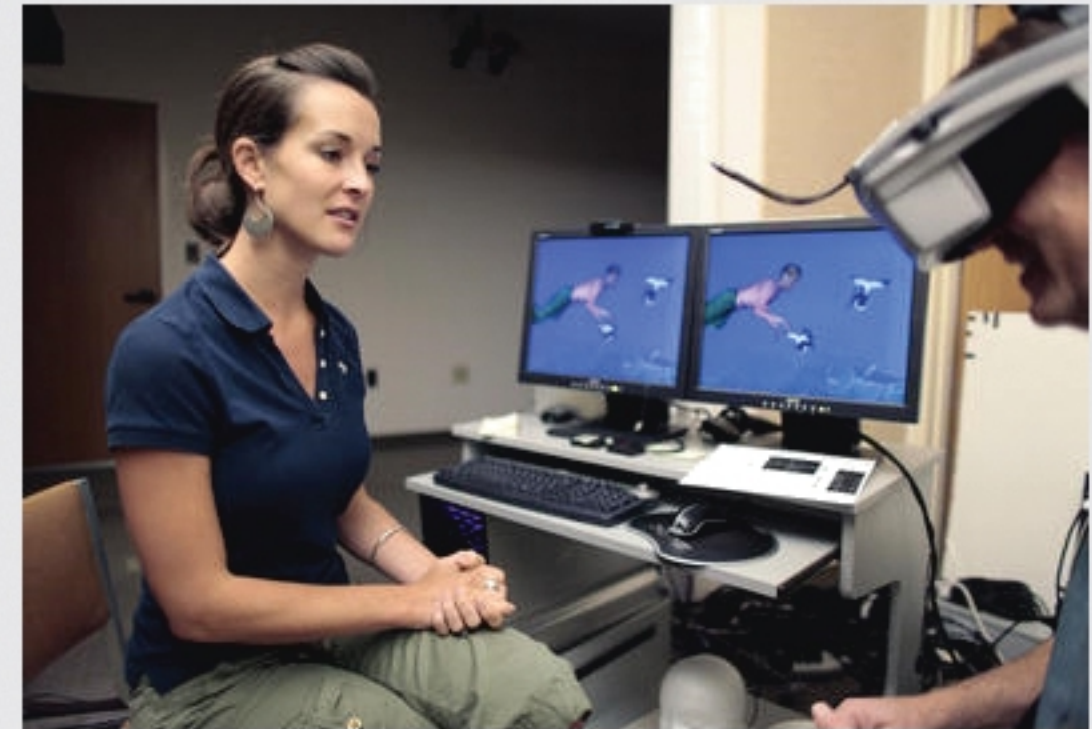
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About the lab

For more information about the Stanford Virtual Human Interaction Lab, go to <http://vhil.stanford.edu>.



July 23, 2009. Sun Joo Ahn , Communication Ph.D. 4th Year, studying consumer behavior/psychology and empathy/Perspective-taking at Stanford University in Palo Alto. Stanford's virtual reality lab is studying ways that the virtual world affects the real one. (LiPo Ching/Mercury News) (LiPo Ching)



July 23, 2009. Kathryn Segovia, Communication Ph.D. 2nd Year, studying legal psychology, and children and false memories at Stanford University in Palo Alto, demonstrates a VR program that simulates a child swimming. Stanford's virtual reality lab is studying ways that the virtual world affects the real one. (LiPo Ching/Mercury News) (LiPo Ching)



July 23, 2009. Jesse Fox, Lab Manager, Communication Ph.D. 4th Year, studying Health communication (using VR to change health behaviors) and sexualization/effects of representations of women, hold sa VR headpiece used in the studies at Stanford University in Palo Alto. Stanford's virtual reality lab is studying ways that the virtual world affects the real one. (LiPo Ching/Mercury News) (LiPo Ching)



July 23, 2009. Doctoral students, Sun Joo Ahn (sitting), Kathryn Segovia, (standing at left) and Jesse Fox (standing at right) demonstrate a Virtual Realty program that simulates walking a plank across a deep pit at Stanford University in Palo Alto. Stanford's virtual reality lab is studying ways that the virtual world affects the real one. (LiPo Ching/Mercury News) (LiPo Ching)