

Berkeleyan



The Reception, a bi-located dance, is featured in the first half of the Berkeley Dance Project 2007's program. (Adam Tow photo)

What does it mean to be present?

A cross-disciplinary performance uses dance and technology to explore this provocative question

By Wendy Edelstein, Public Affairs | 18 April 2007

While most researchers commit their ideas to the page, Lisa Wymore expresses hers on the stage. *The Reception* - a work in the Berkeley Dance Project 2007, an annual showcase, running April 20-29 - is an example of "art functioning as a form of research," says Wymore, an assistant professor in the Department of Theater, Dance, and Performance Studies.

For audiences, Wymore's choreography will look a little different from most modern dance. Dancers on the Zellerbach Playhouse stage will interact with two others whose images will be projected onto a large screen. The on-screen dancers are not only off-stage - they're not even in the building.

Wymore, director of *The Reception*, says she uses the project "to explore physical presence in relationship to virtual or cyber presence." Central to Wymore's investigation is her collaboration with Ruzena Bajcsy - professor of electrical engineering and computer sciences and director emeritus of CITRIS (Center for Information Technology Research in the Interest of Society) - who develops "tele-immersion" systems that create three-dimensional physical representations of people in remote locations that are distinct from animated renditions, such as those used in computer games. Bajcsy's journey to realizing that dream has been incremental, as computing power has lagged behind her vision of real-time tele-immersion.

Bajcsy's work creating cyber-environments goes back to 2000, when at the General Robotics and Active Sensory Perception (GRASP) Laboratory at the University of Pennsylvania her video cameras showed seated participants from the front, and only from the waist up. "Basically, a 180-degree view," she explains.

"Berkeley Dance Project 2007" runs Friday and Saturday, April 20, 21 (Cal Day), 27, and 28, at 8 p.m., and on Sunday, April 22 and 29, at 2 p.m. in Zellerbach Playhouse. Tickets, priced at \$14 general and \$10 for Berkeley faculty and staff, are available through the Zellerbach Playhouse box office (not to be confused with the Zellerbach Hall box office) on Fridays from 1 to 4 p.m., at (866) 468-3399 via Ticketweb, at www.ticketweb.com (<http://www.ticketweb.com>), and at the door one hour prior to showtime.

The April 22 performance will be followed by a discussion, "Being

When Bajcsy came to Berkeley in 2001, she decided she wanted to construct a lab in which the entire body could be seen from all sides. Then, in 2004, she met Wymore. "We clicked," she says simply. "Collaboration really takes a very personal connection, and I just lucked out."

Bajcsy knew dance would lend itself well to the next stage in her tele-immersion work. Wymore, too, saw great potential in the collaboration: "In most virtual worlds - say I'm playing a game of Sims - I can fashion a player that shares some of my physical attributes, but it's not me." By showing the entire body, the tele-immersion lab reveals "how I move, my [physical] language, my gestures and movement patterns." If a friend is walking some distance down the street, "you would recognize her by the way she walks . the way she uses her body," explains Wymore. Those "idiosyncratic, kinesthetic patterns" are a "unique stamp of how we move in the world combined with how we look and talk," she adds.

Step into my lab

Bajcsy constructed her 18X30-foot lab in the Hearst Memorial Mining Building so that she could show the full range of physical movement and gestures - not just a "talking head" seated behind a table. She equipped the lab with 48 video cameras that capture movements from almost every angle, then transmit the information to 14 computers that synthesize the video data, and stream the information via the Internet to other locations such as the stage of the Zellerbach Playhouse theater. The resulting projected images "re-form the body and look as though they're real," says Wymore.

For 15 minutes before *The Reception* begins and then 10 minutes into the performance, two dancers within the tele-immersion lab will be streamed to the stage onto a large projection screen. The dancers in the lab will be able to observe their colleagues via a webcam mounted in the theater.

The "virtual" dancers' images and movements are transmitted in "semi-real time," says Wymore, who emphasizes that what the audience will see is "very different from motion-capture - which is a form of animation." The system being employed in *The Reception* uses image-based rendering, a process that is not quite seamless. If dancers move in slightly slow motion - "like the time signature similar to that found in Tai Chi," says Wymore - the rendering will stay sharp. The video data is dense and complex, and quicker movements may break up and appear pixilated, due to the rendering time necessary to process the incoming information.

Although only the first third of *The Reception* will feature bi-located dance, tele-immersion technology influenced the choreography of the entire piece as well as the theoretical and philosophical questions brought up in the performance, says Wymore: "How do we project emotions onto 2D representations? How have we gotten used to seeing bodies on screen? How can the virtual body be more real and resonant in our lives? How can the notion of distance be diminished through tele-immersion?"

Wymore acknowledges that what audiences at *The Reception* will see is 2D rather than 3D images. "Working with this lab requires a specific kind of projector and screen right now," she explains. But "this is a long-term relationship," and as images "get streamed faster and become more precise, they will become more integral to the performance."

Tele-immersion "attempts to reconstruct you - not as an avatar but as a recognizable individual within one's own body," says Wymore. *The Reception* serves as Wymore and Bajcsy's reply to the criticism that technology makes people "more alienated, insular, and cold."

Tele-immersion has interesting social potential, says Wymore. "In time, if I was to stream to you in a meeting as an extension of teleconferencing, I would appear more present to you if I was three-dimensional and if the sound of my voice was coming from a location near my mouth. My presence would become more real, because there are these cognitive triggers tied into our psychology of how we sense presence."

The day will come when the technology catches up with Bajcsy and Wymore's ideas of its potential. Until then, they liken its hiccups to an earlier technology that came on the scene in the 1880s. "The noise and pixilation are very much like the flickering of images found in early film," says Wymore,

Here: Presence/Remote Presence Within Live and Media-Based Performance," by N. Katherine Hayles, author of *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (University of Chicago Press, 1999). The talk will feature a demonstration of a live bi-located dance utilizing the tele-immersion labs at Berkeley and the University of Illinois, Urbana-Champaign.

noting that dance played a role in that medium's early days. "In its imperfections the technology becomes very beautiful."