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MODERNIZING MEDITATION: RESEARCHERS CREATE VIRTUAL ENVIRONMENT TO TEACH AND ENHANCE MEDITATION

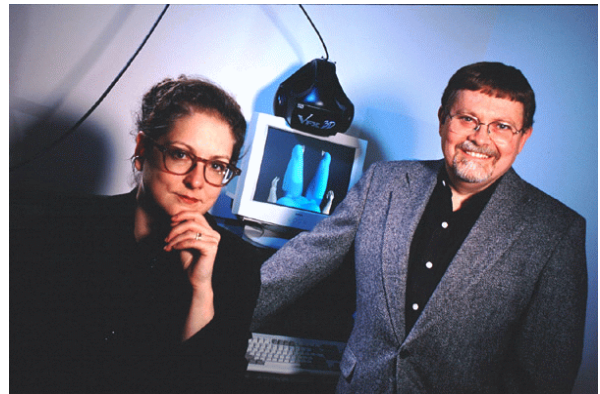
A virtual reality-based program aimed at making meditation more appealing and easier to learn is under development at the Georgia Institute of Technology.

Researchers have created a "meditation chamber," which they have field-tested and are now refining for potential commercialization by a faculty start-up company.

In its current form, the program is a 15-minute virtual experience in relaxation techniques and meditation. Users wear a head-mounted display with audio and video that guides them through a series of sunset and moonrise scenes and muscle relaxation exercises. The system also monitors the users' respiration, pulse rate and sweat gland activity (a measure of calmness) to provide real-time biofeedback regarding the effectiveness of the virtual experience.

"This project started as a support system for doing meditation," explained Larry Hodges, a professor in the College of Computing and virtual reality expert. "... Some people find it very easy to see in their head whatever is the image they want to visualize. But some people have a very difficult time with this, so having visual images to look at and the audio helps a lot."

Also, the added benefit of biofeedback allows the program to modify the user's



With colleague Chris Shaw, Larry Hodges and Diane Gromala have created a virtual reality program to help make meditation more appealing.

experience based on what their body is doing.

"When the sun is going down and the moon is going up, the actual timing of that depends on how your body is relaxing," added Hodges, a veteran meditator. "If you're having a hard time, the program gives you a chance to start over. It actually says, 'Let's try again.'"

The meditation chamber is a collaboration between Hodges, Diane Gromala, an associate professor in the Georgia Tech School of Literature, Communication and Culture, and Chris Shaw, a senior research scientist in the College of Computing. The faculty members also involved their students in the project.

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Researchers demonstrated the meditation chamber for almost 500 attendees at SIGGRAPH, the pre-eminent graphics conference held in Los Angeles in August 2001.

With four booths, the researchers were booked for a week doing 20-minute individual demonstrations for people in the arts, animation and academics. Researchers are now analyzing biofeedback data from those demos and are also reviewing questionnaires completed by participants.

"From the anecdotal evidence people offered at SIGGRAPH, we found that people new to meditation thought it was great," Gromala said. "Even the computer scientists who were really cynical about it actually saw the benefits of the meditation chamber and thought it worked. They were really enthusiastic about it."

Researchers believe the meditation chamber's greatest value will be as a training tool and for delivering feedback to meditators of any experience level. They are now gathering information from clinical psychologists around the country who are offering the meditation chamber experience to their patients.

The psychologists are customers of Hodges' Atlanta-based company, Virtually Better, which has an exclusive license to produce several virtual-reality-based therapeutic technologies developed at Georgia Tech by Hodges and his colleague Barbara Rothbaum, a professor of psychiatry at Emory University in Atlanta.

Hodges believes patients who might not otherwise try meditation will embrace the virtual environment to learn and practice it. "If you read the medical literature, you see that the positive effects of regular meditation are undisputable," he said. "The problem is that people don't do it because it requires discipline. You have to make the time in your life to do these things.

"This is where the virtual environment comes in. It gives the structure to lead you through meditation, not only the audio cues, but also the visualizations," Hodges added.

From a research standpoint, Shaw said: "The meditation chamber may be useful in situations where you want a standard exposure to a relaxation therapy that is timed relatively precisely. It may form a basis for comparative studies of relaxation."

Researchers hope to complete a second-generation version of the meditation chamber this summer based on feedback from the SIGGRAPH demos and psychologists' trials. It may expand to a 20- to 30-minute, more detailed and effective meditation

experience.

"We'd like to refine it so your biofeedback is more obvious and continuous," Gromala explained. "The tough problem in a multimedia realm with multiple inputs is which one you pay attention to. It's difficult in meditation because you want to block out any input. So to continually have graphs and charts being output is not a wise idea. So we're looking at when and how to give people feedback in real time. Maybe it will be a haptic device that you squeeze when you want the feedback."

Also, to give the program wider appeal, researchers plan to make the second version as neutral as possible in terms of audiovisual inferences to various meditation traditions. And they plan to give it a more inviting name, such as "the relaxation environment."

When the meditation chamber is ready for consumer use, Virtually Better will pursue three markets. One is its current target customer -- clinical psychologists already using virtual environments and/or biofeedback for treatment. Another market is health spas, corporate wellness centers or even airport-based booths. The third, and perhaps largest, market is the home- and/or office-based consumer, who would run a shorter, PC-based version of the program that might include simple biofeedback.

Hodges estimates that the software might cost around \$5,000 if sold to smaller markets, such as therapists. But a PC-based version for a large market would be much less expensive. If Virtually Better pursues this market, it would sublicense the technology to a distributor, Hodges added.

Gromala believes the desktop version of the meditation chamber would even appeal to veteran meditators like her. "It would give me a sense of ambient time and cues," she explained. "When you meditate, even if you're experienced, it's still easy to be distracted. The meditation chamber will keep you focused."

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