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LambdaVision helps scientists get big picture

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Picture a wall of big-screen digital TV sets that create one giant image, nearly as picture-perfect as real life.

Researchers at the University of Illinois at Chicago have developed such a 100-million-pixel display screen, measuring 17 feet wide and 8 feet tall, to help scientists work together more effectively to solve problems.

The setup, called LambdaVision, uses software that graduate students created, and it enables scientists to transfer their research from their supercomputers and laptops onto the big screen.

"We believe that in the future, high-resolution screens will be so cheap, we'll be able to wallpaper our meeting rooms with them," said Jason Leigh, one of three directors at the university's Electronic Visualization Laboratory at the West Side campus.

"In the past, such displays have been mainly used to show one big picture," said Luc Renambot, chief designer of the system's software and an assistant professor in the lab.

The LambdaVision setup enables scientists to show graphics from their PCs, laptops, high-definition video and other sources onto different sections of the big wall. It generates the resolution scientists need to study things like models of the Earth's layers.

Leigh said studies have shown that people working together in such situations, with information displayed visually, can achieve tremendous improvements in performance.

"The display helps put your mental model in view, and makes it immediately accessible," he said.

The system is designed to be running constantly, so applications can update the content and alert people to important new data.

Scientists at the U.S. Geological Survey intend to use LambdaVision to view aerial photos of 133 U.S. cities that could require an evacuation of Katrina-sized proportions. The photos provide three times the resolution of a Google mapping system.

Another group that would benefit from LambdaVision is the National Center for Microscopy and Imaging Research, based at the University of California at San Diego. The center builds ultra-high-resolution microscopes so scientists can examine cells in fine detail. The researchers collaborate with their Japanese peers who operate the highest-resolution electron microscope in the world.

The researchers have built a smaller version of the Lambda- Vision wall so they no longer have to sit at their computers to pan and zoom in and out, to see bits and pieces of the images their microscopes have recorded. With the high-resolution video wall, they can see an entire image in extremely high resolution.

The University of Illinois researchers built the video wall by stitching together 55 21-inch LCD panels, and installing the special software for the video images.

The setup eliminates the need for projectors, which require frequent light-bulb changes and have problems with detailed color alignment.

The university obtained a $300,000 grant for the LCD screens and other hardware, and a $13.5 million grant shared with UC-San Diego to develop the software. The National Science Foundation awarded the grants.