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The Irvine Swim League is over and several champions are crowned.

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Columnist Peggy Goetz shares another tale from Africa.

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Did you know that cricket is being played in the city? Find out more about the sport.

# Search-and-rescue goes high-tech

Driven by 9/11, researchers at UC Irvine are developing technology to aid first responders to an emergency.

BY YOLANDA SANCHEZ  
IRVINE WORLD NEWS

It looks like something out of a sci-fi action movie complete with a gas detection device and goggle-mounted computer monitor. But this is no ghost buster or alien battlefield, it's the offices at California Institute for Telecommunications and Information Technology (Calit2) at UC Irvine.

The device is the Evac-Pack, a wearable, wireless, multimodal communications system allowing first responders in emergency evacuations to maintain two-way communication with an operations center. It was developed by Calit2 researchers as part of a five-year National Science Foundation-funded research project called Rescue (Responding to Crises and Unexpected Events). The project, which will begin its fourth year on Oct. 1, is aimed at improving resources to first responders in emergencies.

Sept. 11, 2001, was the impetus of the Rescue project. The first responders at the World Trade Center had to go room to room to search for people, which is not very efficient, said Christopher Davidson, the project's technology manager. "We got together and said 'there is something we can do.'"

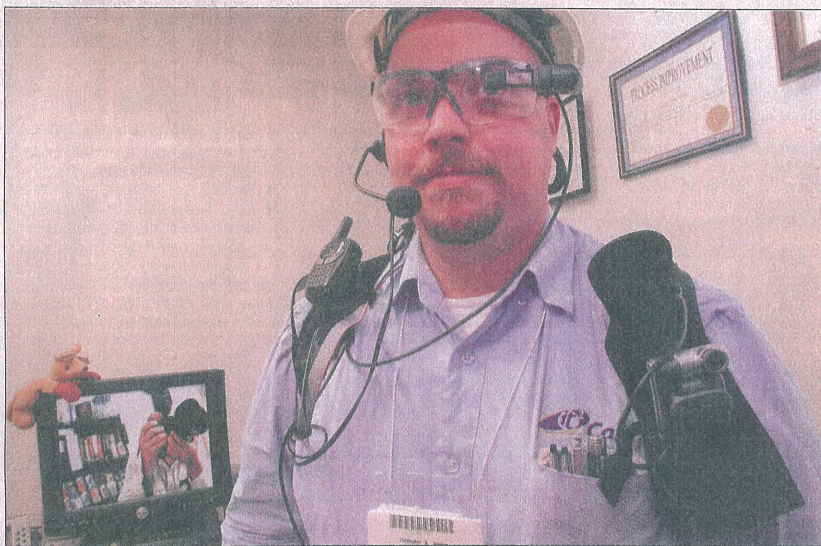
In "smart" buildings that collect information using communication networks, such as 802.11 wireless local area network, a map of each floor can be uploaded into the Evac-Pack wearer's eyepiece. Blue dots on the map indicate occupied rooms, saving rescue time by eliminating room-to-room searches.

The alignment of research for search and rescue is imperative for California, which experiences earthquakes, said project director Sharad Mehrotra.

One of the other operations the project team is working on is a real-time alert system for natural disasters, specifically earthquakes.

The idea behind the system is to connect a monitoring device to seismic sensors at fault lines. The device would then connect to a system in a building, such as a school, that would sound an alarm seconds before an earthquake giving occupants just enough time to duck and cover, Davidson said.

"The reality is that there can be a warning. The goal is to see what we can do to help people take self-pro-



MIGUEL VASCONCELLOS / IRVINE WORLD NEWS

**CHRISTOPHER B. DAVIDSON**, the technology Manager for ResponSphere at the California Institute for Telecommunications and Information Technology, demonstrates the Evac-Pack, a backpack that allows for real-time situational awareness in emergencies. The photographer is seen on a computer monitor taking photos live through a wireless webcam.

tection action," Mehrotra said.

While an earthquake alarm might still be a ways off, the futuristic-looking Evac-Pack is being tested in emergency simulations and adapted based on results.

It was during a drill last year that first responders suggested that the gas detections system, which is part of the Evac-Pack, be added.

The Evac-Pack includes a multi-gas sensor that can measure, in parts per million, the levels of oxygen, carbon monoxide and hydrogen sulfide in a room.

An avionics-designed helmet measures the tilt and pitch of the wearer's head and includes a compass to detect exactly where an individual is located.

Visual display goggles with a tiny computer monitor mounted to one eye allow the wearer to receive messages and images sent from the control center.

An indestructible keyboard mounts to the wearer's arm so he can send text messages, and a wireless mouse allows the wearer to flip through information sent on the display screen.

A first responder can go in, see the damage and verbalize it. The GPS can show where the damage is and send the information back to the first responder in real time, Mehrotra said.

"We usually do a lot of research and don't get to see how it can make a difference in society. We are trying to connect the application with businesses and society," Mehrotra said.



PHOTO COURTESY OF CALIT2

**THE EVAC-PACK** includes a backpack that holds a lightweight computer. Visual display goggles with a tiny computer monitor mounted to one eye allow the wearer to receive messages and images sent from the control center. A video camera mounted to the backpack at chest level allows for video feeds to be transmitted in real-time. A keyboard mounts to the wearer's arm so he can send text messages, and a wireless mouse allows the wearer to flip through information on the display screen. Other features include a multi-gas sensor, an avionics-designed helmet to measure the pitch and tilt of the wearer's head, GPS and blue-tooth.