

## Lab Watch

by Robert Buderl

# Machines meet man halfway

Imagine James Bond driving up a lonely road to a mysterious hilltop research complex. He receives a security badge and is escorted through a steel door to where a brainy scientist awaits.

"Good morning, Mr. Bond," the scientist says.

"What have you got today, Q?" Bond inquires.

It isn't hard to imagine Ted Selker as a corporate 'Q,' 007's eccentric gadget man. Selker heads User Systems Ergonomics Research (USER) at IBM Corp.'s Almaden Research Center in San Jose. Like Q, he dreams up ingenious devices—only instead of instruments of destruction, Selker and his colleagues are devising ways to allow people to interact more intuitively with machines.

Although labs worldwide are hot on the trail of such technology, the crew at USER may be on to something special. "The culture here is 'Prototype now, ask questions later,'" explains Selker, an IBM Fellow and co-inventor of TrackPoint, the red cursor-control button now in about 4 million laptops. Selker has been gadgeteering since he was a boy, when kinfolk habitually brought him TVs to fix at their Thanksgiving gatherings. At USER, Selker is surrounded by about 25 scientists who are adept at everything from programming to psychology.

As in Q's lab, contraptions abound. Computers turn on as users sit down. A weight machine recognizes who slides onto its benches, conceives a personalized workout and bellows, "You can do it!" There are computers you can wear and laptop lids that transform into slide projectors—even machines that recognize

facial expressions. The three main focal areas of investigation are physical, graphical and cognitive interfaces. Some project highlights:

- **Physical.** Take IBM researcher Thomas G. Zimmerman's Personal Area Network (PAN). The basic idea: The body's fluidity allows it to serve as a wet wire and convey electrical signals. In theory this enables anyone toting a specialized transmitter to emit a digital aura that extends a meter or so around the person's body and conveys driver's license, credit lines, access codes and so

forth—without swiping cards through "readers." PAN can automatically log people onto computers and personalize workouts, but a more likely scenario involves travel. Zimmerman, who co-invented the DataGlove—the instrumented glove that enables wearers to move their hands in the virtual world much as they do in real life—envisions PAN carriers entering a hotel lobby, touching a kiosk and learning their room numbers from the screen. Doorknobs will be pre-programmed to grant guests access during their stay.

- **Graphical.** Let's face it: The 20-something-year-old Xerox PARC-Macintosh graphical interface is b-o-r-i-n-g. USER's "ecological" alternatives more realistically simulate an actual work environment, down to desk, bookshelves and wall hangings. Studies indicate that such arrangements—especially in 3D rather than standard 2D—

dramatically improve people's ability to find computer files.

- **Cognitive.** Psychologists say humans share six "universal" facial expressions: anger, disgust, sadness, fear, surprise and joy. The goal of Project Blue Eyes—an image-recognition experiment conceived jointly by USER and Almaden's Visual Media Management arm—is to get computers

to recognize such emotions and adapt behaviors to human moods. For example, the computer might detect pique when a phone call interrupts



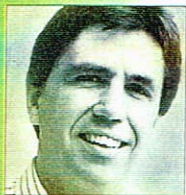
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your work and decide to route calls directly to voice mail as long as that application is open. It also features Query by Image Content, for perusing graphical databases based on image characteristics rather than ambiguous text descriptions. Philatelists, say, could scan a database of U.S. stamps to find those that feature flowers.

Context-sensitive sensors involving speech and facial expressions aren't likely to blossom anytime soon. More immediately, PAN-like creations could handle such mundane tasks as hotel registration, allowing humanoids more quality interactions.

"I see a future where we're going to spend more of our time interacting with the personality of the person we're doing business with than taking Visa cards and things like that," Selker predicts.

Then the Q's of the world might also find more time to make gadgets. ■



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