

New Bluetooth system orients blind and sighted pedestrians

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(PhysOrg.com) -- A new Bluetooth system designed primarily for blind people places a layer of information technology over the real world to tell pedestrians about points of interest along their path as they pass them.

The Talking Points urban orientation system was developed at the University of Michigan. Researchers will present their work at two conferences on Sept. 24.

"Blind people can get from point A to point B. They learn to count steps if they have to, but they miss the journey because they don't always know what they're passing. The idea behind Talking Points is to enhance the journey," said James Knox, adaptive technology coordinator for the University's Information Technology Central Services and one of the system's developers.

"Talking Points can be viewed as a first step in the direction of an audio virtual reality designed for people with blindness and very useful to the sighted community as well," Knox said.

For the sighted community, the system could give passersby a peek at the specials or sales inside a business. It could offer on-the-go access to customer reviews. For blind pedestrians, it could do the same, but it would also fill those gaps in knowledge. Talking Points could help visually-impaired people find public restrooms, police stations, public transportation and restaurants with Braille menus, for example.

"If it caught on, this would be an effective way to tag the whole world," said Jason Stewart, a master's student in the School of Information who is involved in the project. "Anyone with a reader could use it to find out more information about where they are."

Similar systems exist, but Talking Points is the first known to use Bluetooth, cater to both the sighted

and the visually-impaired, allow people to operate it entirely with voice commands, and incorporate community-generated content through a website.

Knox and collaborators in the School of Information and the Department of Electrical Engineering and Computer Science created an early version of Talking Points years ago.

A group of master's students and undergraduates has given the project new energy. They shrunk the receiver and switched the transmitting technology from RFID to the more popular Bluetooth. They are also exploring other technologies such as GPS.

Stewart and fellow School of Information master's students Jakob Hilden and Michelle Escobar will present papers about Talking Points on Sept. 24. Stewart and Hilden will present at the Ubicomp 2008 conference in South Korea. Escobar will present at the Accessible Design in the Digital World conference in the United Kingdom.

The Talking Points system includes several components:

A mobile device picks up the Bluetooth signals and speaks or displays information to the user. In the future, a cell phone could be the receiver, but this prototype isn't a phone. It is slightly larger, about the size of a paperback book. If a user wants more information about a beacon, she can tell the device by voice or touch.

Bluetooth beacons, or tags, would be located at points of interest where owners wish to give information to Talking Points users. Businesses could purchase these beacons, which cost less than \$20. Cities could tag information centers, parks or other buildings, for example.

A website would allow Talking Points beacon owners to program their tags. They could update their messages regularly. Once a beacon is added,

other community members could add their comments about the point of interest. Pedestrians using the system could then choose to get those comments.

"This project enables a type of augmented reality," said Hilden, one of the students who will present the research at Ubicomp. "It shows how we can take user-generated information from the Internet and lay it over reality to help people make sense of where they are in their environment and what the possibilities are around them."

In addition to developing a prototype receiver, the students tested their system in field simulations with visually-impaired and sighted people and conducted focus groups.

"Location-based guide systems of one kind or another have been built and re-built by academic researchers for over a decade now, but this is the first project that has really focused on the needs of the visually impaired and gone out to make sure the system is being developed to meet those needs," said Mark Newman, an assistant professor in the School of Information and the Department of Electrical Engineering and Computer Science. Newman is a co-author of the papers that will be presented.

Source: University of Michigan

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