Smart watch system could help busy, forgetful people keep track of necessities

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Reminding About Tagged Objects Using Passive RFIDs

In the not-so-distant future, **your wristwatch could stop you** if you try to run out the door without the necessities you need for the day, like your keys, wallet or cell phone.
At work, it could prompt you for important items needed for a meeting or a business lunch. In an academic setting, it could remind students which books to take as they hurry out the door for class.
Think of it as a technological string around the finger -- one that's smart enough to take the initiative to save you from the inconvenience and embarrassment of forgotten essentials.

Such integrated, responsive systems are the next logical step in computing, according to Gaetano Borriello, a University of Washington computer scientist who has developed a working prototype of the idea. Borriello is also an expert in the field of ubiquitous, or invisible,

computing, which seeks to seamlessly mesh technology into our lives in ways that are useful and natural.

"This project demonstrates one of the promises of ubiquitous computing, which is that our information systems will be proactive," Borriello explained. "That means that information will be made available as we need it, as opposed to our having to request it."

Borriello presented the research recently at the Sixth International Conference on Ubiquitous Computing in Nottingham, England. Collaborators include UW students Waylon Brunette, Matthew Hall, Carl Hartung and Cameron Tangney. The project was done in collaboration with Intel Corp.

The basis of the system is small electronic labels called radio frequency identification, or RFID, tags, originally developed to automate the task of tracking commercial goods.

"At the heart of this is the idea that tagging objects is a good thing to do, that some useful consumer applications could come out of it," Borriello said. "It doesn't have to be just for supply-chain issues."

The tags consist of an electronic circuit, antenna and memory chip. When pinged by a radio signal, they answer with an ID code identifying the tagged object. The tags currently cost about 50 cents each, and that price is expected to drop dramatically with increased demand as such corporate giants as Walmart implement RFID systems to manage their inventory.

The UW smart watch system equips users with a wristwatch that acts as an interface, driven by a small personal server that the wearer can easily carry in a pocket but which will eventually be part of the wristwatch itself. Important items are labeled with RFID tags and RFID readers are

installed at various locations -- home, car and work, for instance -- to read the tags.

When the person passes a reader, the reader pings the tags and the ID information is broadcast locally to the user's personal server, which processes it and checks to see that all critical items are present. The server also takes into account the last known location of items, the user's calendar and where the user may be going. If the server finds that an item is missing and will be needed, it signals the watch to prompt the wearer.

Even though the reader occasionally missed some of the tagged items when they were carried in out-of-the-way locations, the reasoning process of the server seemed to compensate and allow the system to work well, Borriello said.

The next steps include integrating a wireless location system into the server so it can determine where users are at any given time and whether they are arriving or leaving, and factor that into decision-making. In addition, the group is pursuing funding to turn the UW's Paul G. Allen Center for Computer Science & Engineering into a test building for the system.

"This is really part of a larger effort to create an RFID-enabled building, a sort of microcosm of what society would be like if these things take off," Borriello said, adding that the hope is to have a building-wide system up and running within a year. "We would have about 1,000 people using it and get a better understanding of what the future will bring while we still have a chance to do something about it. We want to explore not only how these systems would work, but also social issues like privacy implications."

Source: University of Washington