


Notes from the Community

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New Kinds of Gadgets, Interactions, and Ubicomp Visions

Jason Hong and Mary Baker

For this installment of Notes from the Community, we start by reviewing several fun gadgets and interaction techniques submitted by readers to the pervasive computing forum (see the sidebar for more information).

One reader shared a link to Koubachi (www.koubachi.com), a Wi-Fi plant sensor that, according to the website, "determines the vitality of your plant and sends you a notification with precise care advice at the right time." Koubachi contains a water sensor, temperature sensor, and light sensor, and it can send notifications to your smartphone (see Figure 1). Or, if you want a less technical approach, do what one of your friendly editors does—just stick to bamboo plants!

Another reader shared a link to a four-minute video showing the Cerebral Hut, an art installation by Turkish architect Guvenc Ozel (http://gizmodo.com/hacked-brainwave-headset-lets-you-control-architecture-508883130). The hut has several panels that can expand and contract, based on input from commercial brainwave readers. By thinking, blinking, and maybe even winking in certain ways, a person can control the size and motion of the panels.

Member syymza shared some research from the University of Washington that looks at detecting changes in Wi-Fi signals to detect human gestures.[1] The system, called WiSee, listens to wireless signals from devices in a home and looks for Doppler shifts that signal a person is moving (see Figure 2).

Readers also shared a *New York Times* article about how young children with chronic health issues are using telepresence robots to attend school, with some children personalizing them by dressing up the robots.[2] About 40 VGo robots (www.vgocom.com) have been sold to schools and are in use.

Readers were also directed to WorldKit, a research project at Carnegie Mellon University aimed at turning one's entire physical environment into a touchable user interface.[3] Combining a projector and a Microsoft Kinect, WorldKit lets developers turn arbitrary surfaces into buttons, radial dials, sliders, and more. See www.chrisharrison.net/index.php/Research/WorldKit for more details.

TRANSPORTATION SOLUTIONS

Transportation solutions also received a lot of attention, including an article about using water curtains to control traffic.[4] In Sydney, Australia, city officials were having problems with large trucks driving into highway underpasses and getting stuck. What they needed was a reliable stop sign that drivers couldn't miss. The solution is simple and ingenious: stream a curtain of water in front of the underpass and project the stop sign on the water! The article has a nice animated GIF that succinctly communicates the idea.

One reader shared an article about electronic license plates, which use electronic paper technologies to display potentially useful information.[5] Examples might include highlighting words over the license, such as "suspended license," "uninsured," or even "stolen." These electronic license plates are currently in the early stage of discussion in South Carolina, although there are many cost, privacy, and utility issues to resolve.

Reader the0therbk directed people toward a *Mashable* article about LiveMap, a crowdfunded, augmented motorcycle helmet that's currently being designed and built.[6] The helmet features voice commands and a

JOIN OUR SUBREDDIT

This column offers a summary of interesting news and research in pervasive and mobile computing, with content drawn from submissions from a shared community on the social news site Reddit, at www.reddit.com/r/pervasivecomputing. We encourage you to join our subreddit and spread the news of this site to others, so that together we can build a sustainable online community for all aspects of pervasive and ubiquitous computing. — *Jason Hong and Mary Baker*

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projected display on the helmet to help with navigation. The target is to ship the helmet in August 2014 for about US$2,000.

The0therbk also pointed readers to an article from *The Verge* about Garmin's new portable heads up display (HUD) for cars.[7] The HUD can use Bluetooth to connect to Garmin's StreetPilot or Navigon smartphone app. Using this data, the HUD can then display directions, traffic delays, speed limits, and more.

SMART CITIES

Cities and citizen-directed data combine in a 2010 *Wired* article entitled, "What a Hundred Million Calls to 311 Reveal about New York."[8] The article looks at big data approaches to analyze problems that citizens are facing. Examples include looking for clusters of complaints, both temporal and geographic. These include multiple complaints about noise in a geographic area, a set of public drinking complaints in a specific neighborhood, or even calls about food-borne illnesses from the same restaurant.

Perhaps even more interesting is the annual NYC BigApps competition, where participants can submit Web or smartphone apps that draw on the city's numerous databases. This kind of competition and open data seems to be part of a growing trend, where national, state, and city governments are making data publicly and openly available for app developers to innovate (see, for example, www.data.gov, which "increases the ability of the public to easily find, download, and use datasets that are generated and held by the [US] Federal Government").

On a lighter note, readers also pointed to an article on The Atlantic Cities website about how quadrocopter drones are being used to deliver sushi.[9] Fear not, brave reader, these aren't autonomous drones delivering sushi to hapless bystanders; rather, an employee of the Japanese fast-food chain Yo! Sushi controls the drones. Although most initial pilot tests in London fared well, due to either lower battery power or high winds, one unlucky customer apparently had his food sprayed all over the place after the drone tilted and the food fell into the rotor blades. Given

Figure 1. The Koubachi sensor lets you remotely monitor the water, temperature, and light data for your plants. (Source: Koubachi (www.koubachi.com); used with permission.)

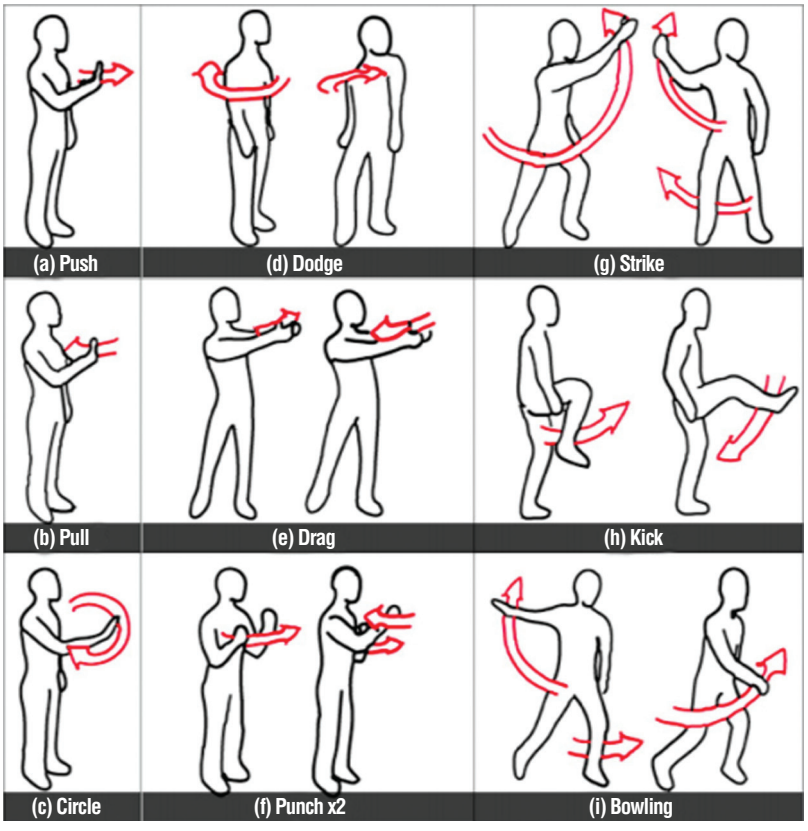

Figure 2. WiSee can detect and classify these nine gestures in line-of-sight, nonline-of-sight, and through-the-wall scenarios with an average accuracy of 94 percent. (Source: Shyamnath Gollakota; used with permission.)

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Figure 3. WorldKit combines a projector with a Microsoft Kinect to let developers put touchable user interfaces on any surface. (Source: Chris Harrison and Robert Xiao; used with permission.)

that this is all in the name of progress, this customer's sacrifice won't be forgotten!

SMARTPHONES

Reader jlinphd shared an *Ars Technica* article entitled, "The PC Inside Your Phone: A Guide to the System-on-a-Chip."[10] The article discusses the differences between the various systems on a chip manufactured by Apple, Qualcomm, Samsung, Nvidia, Texas Instruments, Intel, and AMD. The article offers a nice nutshell summary of how different manufacturers combine CPU, GPU, RAM, and buses in several different ways to tweak performance and energy.

Reader jlinphd also shared a link to a *Wall Street Journal* article discussing why philanderers in Japan still use one particular Fujitsu DoCoMo phone, primarily because of its privacy features.[11] This phone has a special privacy mode that can hide missed calls, emails, and text messages from contacts that the owner labels as private. It also can show these missed communications using subtle cues, such as in the battery icon or the signal strength icon. The article has a short video summarizing the features.

Reader shenhongzhou shared a video featuring the Nokia GEM, a concept phone where the entire body of the phone is a screen (http://v.youku.com/v_show/id_XMzIxNDQ5MTE2.html). The concept video shows a lot of interaction techniques familiar to the CHI community, including bumping, physics-based interactions with icons, back-of-screen interactions to manipulate items on the front, and more.

Reader m_alzantot points us toward an *MIT Tech Review* article about using smartphones to crowdsource indoor floorplans.[12] Making maps of indoor locations is usually done manually, which is a slow and tedious process. As an alternative, Moustafa Alzantot and Moustafa Youssef at Alexandria University developed an app called CrowdInside to crowdsource sensor data and build up these maps. The app uses a combination of known points (such as entrances, escalators, and elevators) that sensor data can pinpoint reliably in conjunction with dead reckoning.

UBICOMP AND ART

Several submissions combined ubiquitous computing with art. Reader the0therbk shared a 1997 video by IBM showcasing wearable computers (http://vimeo.com/20398025). The short video shows the aesthetic potential of wearable computers, with a heads up display that strikingly resembles Google Glass.

Reader syymza shared a piece on how artists Shin Seung Back and Kim Yong Hun applied basic face recognition algorithms to pictures of clouds, to find cloud patterns that happen to look like faces.[13] Their gallery can be viewed at http://ssbkyh.com/works/cloud_face.

Readers were directed to a neat concept design that combines the familiar Rubik's Cube with an mp3 player.[14] To start playing a song, unsolve the puzzle. To stop playing, solve the puzzle.

VISIONS OF UBICOMP

A shared *Gizmodo* article poses an important question for all of us working in pervasive computing: Will the Internet of Things make our lives any easier?[15] The article observes that in the mid-1970s, sociologist Joann Vanek argued that the rise of electric appliances, such as dishwashers and vacuum cleaners, made housework more efficient, which changed our standards for household and personal cleanliness. We have already seen how always-on connectivity has blended work and home. The article pushes the question to its logical conclusion, which is will the Internet of Things lead to more leisure time, or will it just change our standards and expectations?

Readers also shared a link to The Institute for the Future's annual Technology Horizons conference, the theme this year being The Age of Networked Matter. The IFTF commissioned several short stories from well-known sci-fi authors, including Cory Doctorow, Warren Ellis, Rudy Rucker, Bruce Sterling, Ramez Naam, and Madeline Ashby. At the conference, various futuristic topics were discussed, including brain-to-brain interfaces, smart cities, Maker culture,

and more (see www.iftf.org/future-now/article-detail/keep-the-future-weird-the-age-of-networked-matter).

Finally, readers were directed to an article on *The Verge*, looking at the connection between science fiction and user interface design.[16] Nathan Shedroff and Christopher Noessel, two well-known interaction designers, recently published a book entitled *Make It So: Interface Design Lessons From Sci-Fi* (Rosenfeld Media, 2012). They take a look at futuristic user interfaces in movies such as *Iron Man*, *Avatar*, *Forbidden Planet*, and *Barbarella*. Rather than critiquing the user interface designs, the two authors probe how characters in the movies use the systems. See more of their critiques of sci-fi user interfaces at http://scifiinterfaces.wordpress.com.

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