

Lancaster U. Tests Futuristic Mobile Applications in the Real World



The Mobile Radicals' experimental "augmented reality" application overlays the view through a camera phone's lens with imaginary 3D images, based on the device's GPS position and orientation.

A camera phone that can overlay imaginary 3D dragons or spaceships over a view of your office or house. Mobile blogs for schoolchildren. A skin galvanometer that charts your stress levels as you move about your town or city. Science fiction? No, just a few of the futuristic mobile applications being created and tested by a group of young researchers at the U.K.'s Lancaster University, a member of Forum Nokia PRO, Nokia's premier program for mobile developers. These researchers—doctoral and master's candidates at the university's InfoLab21 research center—are led by Paul Coulton, a senior lecturer in the department of communications systems, co manager of the Forum Nokia Innovation Hub in the U.K., and a Forum Nokia Champion. Coulton's dozen or so graduate students collectively call themselves the Mobile Radicals.

"When technology like GPS and accelerometers become standard features in more phones, it's going to appeal to the masses." — Paul Coulton, head of Mobile Radicals, Lancaster University

Although many university and industry researchers are developing and testing mobile applications, what distinguishes the Mobile Radicals is their use of real-world test subjects. Coulton often begins a research project by simply announcing it on his Forum Nokia blog. "I like to test things 'in the wild' rather than in the enclosed world of a normal research lab," Coulton says. "So I invite the community to try things for themselves"

Futuristic applications

One hot area of research for the Mobile Radicals is location-based services (LBS). One LBS application created by the group is called GeoBlog, which involves giving a group of some 30 local schoolchildren a camera phone and global positioning system (GPS) unit. The children used the mobile devices to create messages and photos, and the Mobile Radicals team incorporated maps with the children's content. "We essentially captured a GPS trail of their journeys," Coulton says. A related service, LocoBlog, consists of a Java™ Platform, Micro Edition (Java™ ME) client application that first links the phone via Bluetooth to a GPS unit, and then lets the user create blogs of text and pictures that are tagged with positional data. The blog is then sent via general packet radio service (GPRS) to the LocoBlog site, where it can be viewed on Google Maps.

LocoMash, another mobile application created and tested by Coulton and company, is described as a mobile mass-observation system. It lets groups of individuals equipped with mobile camera phones and GPS create real-time spatial and temporal photographic mashups around a particular event or place, such as the 2007 Roskilde Festival in Denmark. "People like maps as a way of visualizing information and actually seeing how



InfoLab21
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<http://www.infolab21.lancs.ac.uk/>



Mobile Radicals
<http://www.mobileradicals.com/>



"We're looking at other ways of using existing and emerging mobile technology in a more sociable way, to bring people together with their immediate environment and the people around them," says Paul Coulton, a senior lecturer in the Department of Communications Systems at Lancaster University's InfoLab21 research center, head of the Mobile Radicals research team, co-manager of the Forum Nokia Innovation Hub in the U.K., and a Forum Nokia Champion.

Read Paul's blog at:
<http://blogs.forum.nokia.com/blog/paul-coultons-forum-nokia-blog>

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you've taken pictures on a journey," Coulton says. "Rather than just a set of linear images, which is what you often get, here you get an impression of how far people have traveled and what the environment is really like. With the map, you get a more interesting view of the journey."

Forum Nokia support

Nearly all of the Mobile Radicals' mobile applications are designed to run on Nokia S60 devices, in part, Coulton says, because Nokia has been a loyal and reliable provider of devices. "Nokia has been very supportive of our work, supplying us with toys!" he quips, adding, "Nokia is much quicker to bring new technologies into the phones than some of the other manufacturers."

That's important, because many of the Mobile Radicals' applications take advantage of cutting-edge technology, such as the Nokia N95 multimedia computer's built-in assisted global positioning system (A-GPS) chip and the Nokia 6210 Navigator's built-in compass, which measures changes in direction and orientation. "When technology like GPS, accelerometers and compasses become standard features in more phones, it's going to appeal to the masses," Coulton says. "For example, there's been huge excitement about the accelerometer games, and for the future, there's a lot of potential there." Coulton's involvement with Nokia extends to his co-chairmanship of the Forum Nokia Innovation Network in the U.K., a dedicated cluster of selected Forum Nokia PRO university members. The network focuses on applied research, proof-of-concept development, real-world testing, rapid prototyping, and mobile systems and applications training and education. "It's a way of building a bigger community, really," Coulton says.

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Distribution and community-building

Coulton and his colleagues are active posters to a number of online communities. For one, Coulton writes a blog on the Forum Nokia site. His recent postings have included such topics as heart-controlled mobile interaction, WidSets, and Near Field Communication (NFC) games. The researchers have also published numerous papers. The Mobile Radicals publication page currently lists more than 120 articles, covering such topics as "3-D Space-Time Visualization of Player Behavior in Pervasive Location-Based Games" and "Providing Location-Based Information/Advertising for Existing Mobile Phone Users." They are also frequent speakers at industry conferences, and frequent winners of industry awards.

Looking ahead

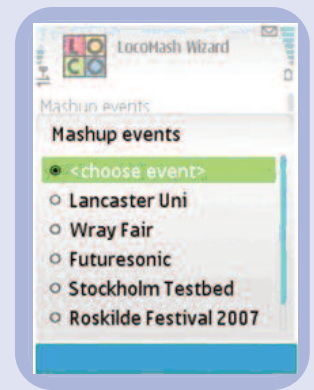
Coulton and colleagues are currently looking into three areas for future development and research. One involves using heart-rate monitors and other biological sensors to capture physiological feedback from users, then linking that data with GPS information, to understand various health issues. A related project will use a skin galvanometer, which measures or detects a small electrical current, as people move through a city. "We hope to see whatever it is they find stressful, or how their perception changes through a physical reaction," Coulton explains.

A second area will combine context-awareness with all forms of messaging. For example, not only could consumers use their mobile device to check their list of contacts, they could also spot the location of their friends, what they're doing, even what kind of mood they're in. "You would see a little avatar for each person on your contact list, a picture with little icons around them," Coulton explains.

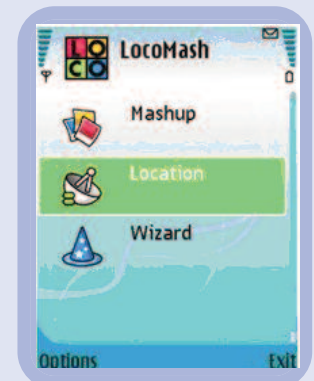
Third on the future list is what Coulton and his colleagues call "mobile augmented reality." Here, a 3D image is superimposed in the lens of a camera phone, and GPS and compass data is used to determine which images should be shown when. "You look through the camera's lens and, based on the GPS position and orientation of the camera, the application overlays 3D images into the real world," Coulton says. "So I could put dragons over buildings. Or show you what people looked like 100 years ago." Possible applications include tour guides, a program that locates WLAN hot spots, visualizes pollution levels in your vicinity. "It's an interesting way of seeing the world," Coulton adds, "because you can carry it around in your pocket."

For more information, go to:

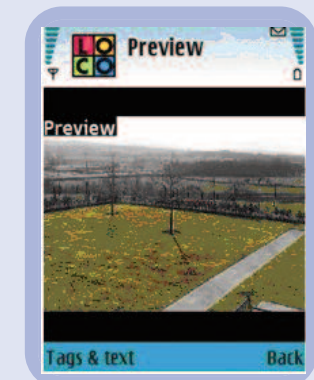
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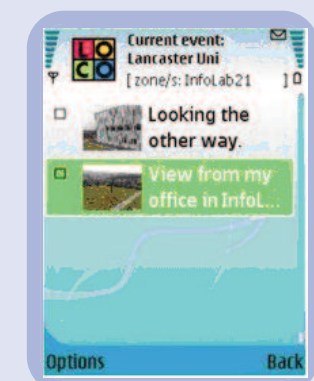
LocoMash is a mobile device-based mass-observation system.



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