



New Products

Editors: Maria R. Ebling ■ IBM T.J. Watson Research Center ■ ebling@us.ibm.com
Ramón Cáceres ■ AT&T Labs ■ ramon@research.att.com

Gaming and Augmented Reality Come to Location-Based Services

EDITORS' INTRO

For the next two issues, Ramón Cáceres joins Maria Ebling as coeditor of the New Products column. We start by presenting two mobile phone services that combine gaming, location, and social components. We then describe three local-search applications that recently added augmented-reality features. Please continue to send pointers to upcoming products with exciting possibilities, your feedback on existing products, and your personal experiences with them (your name will be included with your review). Email us at pvcproducts@computer.org.

—Ramón Cáceres and Maria Ebling

LIFE AS A GAME

Foursquare (www.foursquare.com) adds gaming aspects to location-based social networking applications for mobile phones. The more familiar features let users check in to the service with a status message and a location, such as a restaurant or a bar, and establish friend relationships to view each other's updates (see Figure 1a). The service's possible uses include finding out when friends are nearby and deciding where to go on a night out.

Other services such as Brightkite and Loopt offer similar functionality, but Foursquare's novel gaming element lets users compete

for standing in the service by earning points, mayorships, and badges. Users obtain points when they check in on weeknights or weekends. The user who checks in to an establishment the most becomes that establishment's mayor—but only until someone else ousts him or her by topping the record. Users collect badges when they achieve milestones such as checking in to 25 unique venues or checking in after 3 a.m. on a weeknight (see Figure 1b). To encourage competition, the

service maintains a leaderboard that ranks users by the number of points they obtained in the current week (see Figure 1c).

Gowalla (www.gowalla.com) is similar to Foursquare—users check in at locations and compete for standing—but it has several notable differences. For instance, instead of points and badges, users obtain a passport stamp for each spot they visit (see Figure 2). Gowalla also has aspects of a scavenger hunt, wherein users collect virtual objects left in the places they visit. Finally, whereas Foursquare lets users manually specify a check-in location, Gowalla restricts check-ins to named spots determined by the mobile device's automatic-localization functions, such as GPS. Gowalla is thus less prone to users lying about their locations to gain an advantage, but it depends more on the automatic-localization function's availability and accuracy. We're

Figure 1. Foursquare.

(a) The check-in list includes friends' names and locations and a status message. (b) Users earn badges when they achieve milestones such as checking in at 25 unique venues. (c) A leaderboard fuels competition.



NEW PRODUCTS



Figure 2. Gowalla users collect (a) stamps for their (b) passports when they visit predefined locations.

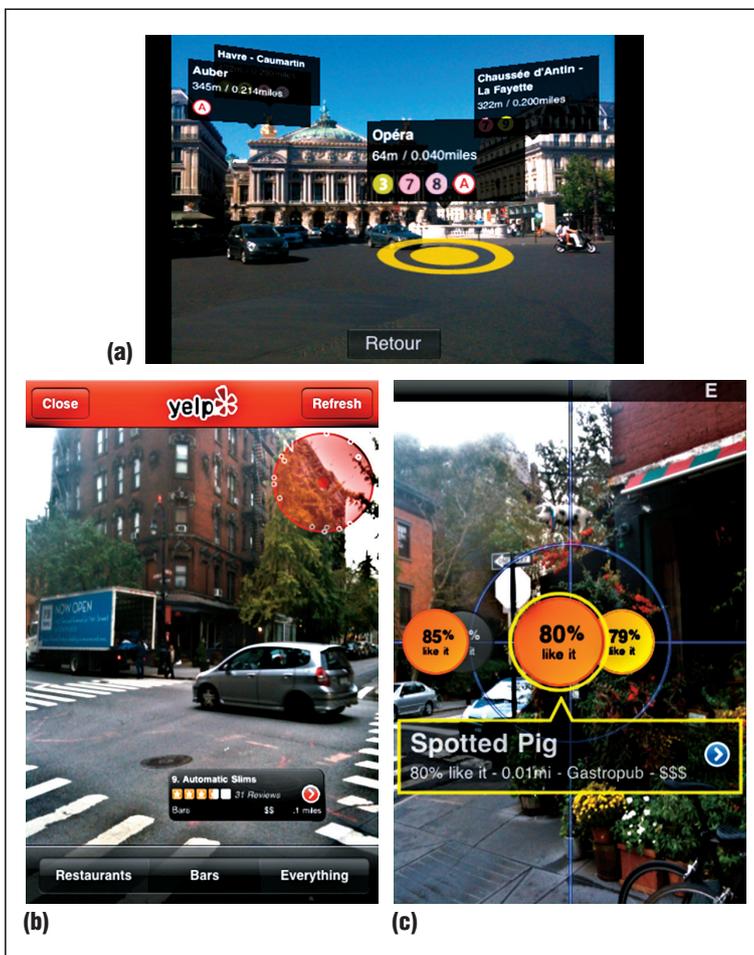


Figure 3. Using a GPS receiver and a compass, (a) Metro Paris Subway, (b) Yelp, and (c) Urbanspoon services superimpose point-of-interest data on a live camera view.

interested in seeing how the trade-offs between automatic and manual localization play out in these and other location-based services.

Through their gaming components, Foursquare and Gowalla aim to not only increase use of their services but also encourage people to explore the cities they live in. In addition, both services let users publish their gaming achievements on other social services such as Facebook and Twitter.

AUGMENTED REALITY IS HERE

Advances in mobile hardware are quickly enabling commercial mobile application functionality that was, until recently, available only in research prototypes. For instance, mobile applications with augmented-reality functionality can superimpose computer-generated imagery on a live view of the physical world. These applications work with mobile devices that include a GPS receiver, a compass, and a camera, such as the HTC Android G1 and the Apple iPhone 3GS. The applications use the GPS receiver and compass to determine the phone's position and orientation. Using this information, they query a geographic database for relevant results, then superimpose a visualization of these results on a live camera feed.

Three local-search applications with augmented-reality features are Metro Paris Subway (www.metroparisiphone.com/index_en.html), Yelp (www.yelp.com), and Urbanspoon (www.urbanspoon.com). Metro Paris Subway provides information about public transportation options and points of interest. Yelp and Urbanspoon allow browsing and searching for information about restaurants and similar businesses, including maps, directions, and reviews. Their augmented-reality features overlay information on a live camera view about points of interest lying in the direction the camera is pointing. Figure 3 shows examples of these overlays.

All three applications both exploit and depend on mobile phones' automatic-localization functions and, similar to Foursquare and Gowalla, exhibit trade-offs relative to manual localization. Urbanspoon makes explicit allowances for automatic-localization inaccuracies, letting users manually correct location errors by using the phone's touchscreen to move a location pointer on a map. Augmented-reality features still need work to function seamlessly on mobile devices, but they already show the exciting promise of things to come. **■**