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Indoor Location-Based Social Networking

Location-based social networking (LBS) uses the GPS on a smartphone or tablet to find a person's current location. You and friends can share your locations with each other, then use the information to meet up, play high-tech games of hide and seek, or find a place to hangout that is relatively close to each person's current location.

WiFiSLAM

Photo 1—If shared, each person's location will appear as a separate name-tagged pinpoint on the map. You can use your phone's zoom feature to see distant friends.

I have the Google app Latitude running on my smartphone. I can share my location with my friends and they can share their locations with me. If shared, each person's location will appear as a separate name-tagged pinpoint on the map. (See Photo 1.) GPS technology has its limits, though, so when you enter a building the structure most likely will block your phone from receiving a GPS signal and your current location can't be shown. A new GPS/Wi-Fi enabled system has recently been announced, and when it goes online it will allow location-based social networking systems to track enabled phones and tablets indoors.

The technology was developed by a group of students at Stanford University. WiFiSLAM can find your indoor location by fusing information from a number of sources. The starting point, of course, would be your last GPS location. When your GPS signal is lost, your phone will start to rely on the signals it receives from in-range Wi-Fi networks. Your phone will use these Wi-Fi networks' identification signals to determine its relative distance from each one by their changing signal strength as you walk. You don't need password access to the Wi-Fi networks for the system to acquire the information it needs to fingerprint your location. The system will also refine data by adding in your changing direction and speed of motion, which are gathered by your phone's internal compass and accelerometer. When all is said and done, the processor on your phone or tablet will be able to place you within just a few steps of your actual location. (See Photo 2.)

To get the system operational, the company first needs people, running a special app on their Smartphone or tablet computer, to walk around buildings and malls to map the structures' Wi-Fi signatures. These walkers will perform the same map-building information gathering that Google and other companies do when they use mapping trucks to geo-tag streets, highways, homes, buildings, and places of interest. The walkers will help develop indoor maps that will eventually be used by a WiFiSLAM phone or tablet application to find your indoor location. This very young company hopes that walkers will eventually map every hospital, building, mall, and large store to create an online database that your phone will be able to use, with your permission, to access your location wherever you go.

In the same way that the developers of GPS never envisioned that their creation would provide you with turn-by-turn driving instructions, we can't tell how WiFiSLAM will be used in the future. The obvious uses are personal indoor navigation to your friends, an office within a building, a specific store location in a mall, or even to a specific item in a store. Your favorite store will want to use your phone's app to catch your attention and let you know that an item you want is now in stock or they have a special sale price just for you. Phone apps like GeoQpons will want to enhance WiFiSLAM to provide you with special deals for every store you pass to entice you to go in and purchase something.

Photo 2—WiFiSLAM's future app running inside a mall

Recalling the Facts

1. How will the WiFiSLAM application find your indoor location?
2. What do you think are the positive and/or negative ways in which this system might be used in the future?

Alan Pierce, Ed.D., CSIT, is a technology education consultant. Visit www.technologytoday.us for past columns and teacher resources.

