Overview

Today, people are more and more relying on localization services like mobile map applications and embedded global positioning system (GPS) devices to find their destinations and position themselves. However, GPS is not accurate for indoor localization since the signal is blocked by walls of buildings.

Nowadays, Wi-Fi has become more common in offices, homes and even public areas. Wi-Fi is a better choice to replace GPS as an indicator because it is more accurate than GPS as GPS can only check for 2 dimensional coordinates while Wi-Fi can check 3 dimensional coordinates. That means the system is able to locate which floor the receiver is. It is a very useful technology because it can be used for many different purposes. For example, we can search for a book in library, locate people or suggest a path for people to get to their destination.

Aims and Objectives

- Collection Wi-Fi signal strength data and build an offline database
- Build an Android platform mobile application for indoor localization
- No connection between Wi-Fi access points and mobile device

Methodology

Figure 1 shows the basic working principle of the application. The Android device process the Wi-Fi signal strength and convert the coordinates to display the location on map.

Figure 2 shows the software implementation of the system. Whereami, calls out the function ContinuousLocalization and WiFiScanReceiver to control the wireless network receiver of the mobile device to measure the Wi-Fi signal strength. LocUs controls the whole application activities and call RealMapTileViewActivity and RangeView to display the processed results on virtual map.

Results

The application was built and the interface is shown on the above figures (Figure 3 and 4). The application provides an indoor localization services in HKUST academic building for users like visitors, students and staff.