Indoor localization based on Wi-Fi RSS (Received Signal Strength) has received a lot of attention in recent years, and many implementations have been attempted. A major obstacle for the systems is the offline surveying process creating for a radio map may or may not be readily available.

Further, Wi-Fi deployment may change over time, making the radio map invalid over time. To address these problems, the Adaptive Wi-Fi Positioning System (AWPS), an unsupervised Simultaneous Localization and Mapping (SLAM) system for automatic floor map and radio map construction using crowd-sourced data, has been proposed. The target deployment area of AWPS is a campus indoor environment such as the one at HKUST. This system can be bootstrapped by a simple survey process which is a random walk-through of the coverage area.

Afterwards, RSS measurements from a large number of users, the crowd, will be used to complete and update the floor map and the radio map. The objective of this project is to develop an app to be used by the crowd, which are assumed to be students at HKUST. The apps should be useful so that students will be encouraged to turn on the apps, allowing AWPS to collect crowd-sourced RSS data.

Objective

Our main purpose of this project is to develop the apps client for the crowd and to develop the server for collecting data from the crowd, in support of AWPS which promises to provide an effective positioning solution using Wi-Fi-based indoor positioning. AWPS avoids the lengthy and tedious surveying process for setting up and updating the radio map for a Wi-Fi RSS-based indoor localization system. In this project, an app in android platform will be implemented to collect crowd-sourced RSS data of students with useful location information associated to support AWPS generate an indoor positioning system. To collect the crowd sourced WiFi RSS trace for the application in AWPS from the mobile gadgets implicitly, our goal of the project is to create an app with multiple functions to motivate students to download and use it. The functions includes the class schedule reminder, online shop platform, the client density indicator of the canteens and the RSS trace extraction function which is embedded in the apps.

Methodology

1. The WiFi RSS data collector system will have client side and server side. The client side can be installed into android phone and run the app to start data collecting. The server side will be a broadcast domain that can be accessed by any phone to automatically upload the wifi RSS data to the server.
2. The proposed Login and Register system and timetable extraction apply multiple protocols to construct the entire system. The SQLite protocol is used to create a database server with a local IP address to store the users’ data. The PHP protocol is applied to construct the client API for interacting with the database server and retrieving the target information in XML format. Furthermore, the server needs to be hosted in a broadcast domain that can be accessible from anywhere inside domain. The Login and Register system is constructed and the user can connect the server by the JAVA protocol.

Result

Data Collection:

Database:

Function: