Acknowledgement

**Abstract**

The objective of this research project is to provide an easy and affordable way to design and implement an indoor navigation system using Wi-Fi technology. Furthermore, this research tries to find the feasibility of locating mobile devices for indoor environment by building a prototype for Zurn’s building third floor. Fingerprinting method is used for estimating the current location. This method uses the recorded Wi-Fi fingerprints for each location, which was collected in offline mode, to match each received AP signal. In this method, the Euclidian distance algorithm is used to find the nearest location that match the current received Wi-Fi fingerprint. The results shows that fingerprinting method is more accurate at identifying long distance locations compared with different parts of a room.

# Introduction:

Outdoor positioning system has been available for a very long time. It is called Global Positioning System which stands for GPS. It uses the signal that are sent from multiple GPS satellites to determine the current position. However, GPS cannot be used for indoor environments, because the GPS signal is blocked by building walls.

In In recent years, many indoor positioning systems have adopted Wi-Fi technology for position detection due to its low cost and flexibility. Wi-Fi technology is now used almost everywhere to provide access to the local network or the World Wide Web. Complex building such as malls, schools and universities are some the places that can have a high benefit from providing indoor map and navigation. There are many uses to indoor map positioning such as locating current position and getting direction to another location.

# Objective:

The objective of this research project is to create a generic prototype of an indoor positioning system. This indoor positioning system has two parts. The first part is to create an android application for recording Wi-Fi fingerprints. This application will be used for creating Wi-Fi fingerprint for different localities. The second part is to design and implement an android application for positioning using one of the Wi-Fi positioning methods. This application will show the current identified position based on the current captured Wi-Fi signal. This research project has been done as a case study on Zurn’s building third floor.

# Requirements:

* 1. WiFi Fingerprints Recoring:

An application for recording WiFi fingerpring is needed. It should scan for all received AP signals and record it in a database. This requirement is critical, because buil

* 1. Detecting Current Location Using Wi-Fi:
  2. Indoor Map has at Least Three different Localities:
  3. Position Detection Takes Less than 1 second:

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