MODELLING DATABASE FOR INDOOR NAVIGATION SYSTEM

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With the name of ALLAH Most Gracious Most Merciful

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ABSTRACT

This thesis present the Modelling Database for Indoor Navigation System. The problem for indoor navigation system is the insufficient signal to locating the user by using outdoor locating technologies. The system only rely on the use of identification of nearby Wi-Fi access point. In order to create database for indoor navigation system, two technique were applied for this project and the best technique was chosen for further operation which are localization and navigation in order to create the indoor navigation system. The first technique is Inertia Measurement Units technique (IMU). The system consist of portable unit and fixed unit. Portable unit attached to the user and fixed unit used to monitor the movement of user. The system is equipped with three-dimensional axis by the used of gyroscope, accelerometer and magnetometer to determine the user's movement and sent the data to fixed unit through nearby access point. For fingerprint technique, Wi-Fi access point (AP) is required to create the reference point (RP) using fingerprint technique by collecting the RSSI value for each access point (AP). The method used is gather the data using Wi-Fi fingerprint Apps on smartphone. 22 reference point is created to cover the public corridor at B5-A13 Faculty of Chemical Engineering. The data collected four time in order to get the mean value of signal strength. The signal strength recorded by using Microsoft Excel so the data can be import and process in the MATLAB for localization and navigation purpose. This paper discuss application of fingerprint and IMU technique, and how it can be applied into the system as a database.

Keyword - Wi-Fi, Received Signal Strength Indicators (RSSI), Access Points (AP), Reference Point (RP), Inertia Measurement Unit (IMU)

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

The navigation technologies has improved rapidly in this world nowadays. Most of the locating and navigation technology is being done outdoor. The GPS receiver can only operate outdoor when most of the application use in automobiles. From here, it has discover the new problem where there are demand of this kind of technology that can work in the building. The system only rely on the use of identification of nearby Wi-Fi access point or cellular communication signals did not provide the location of individual user precisely and unable to differentiate between individual room in a building.

The GPS system become unreliable indoors due to the signal interferences that may cause by the wall that separate each room in the building. Based on this limitation, the navigation inside a building can still be done by study the maps posted in the building. A system that is capable of locating user and directing them to the desired destination can be developed.

The environment of city with the building surrounding people is the important factor indoor navigation should be apply since most of people spend their time indoors such as office, classes and shopping mall in their daily life. It is very important for people to know their location and destination when they are in the middle of big building. Indoor navigation system is a device that using an indoor network to locate and navigate the user inside a building to the specific location that user desired.