

Indoor Localization for Mobile Devices Using Bluetooth Low Energy Beacons and Wi-Fi Access Points

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Abstract—Due to the weaknesses of GPS signals indoors, a successful method of indoor navigation is an important research topic. An indoor navigation application running on a mobile device has numerous uses. The application could help new students locate their classes or professors and it would especially benefit disabled students by directing the student in the right direction while taking the shortest route. This project presents a prototype of an indoor navigation system using Bluetooth Low Energy beacon devices and mobile phones. Bluetooth Low Energy (BLE) beacons provide a way of locating a mobile device within doors. The mobile device has the capability to receive Bluetooth signals sent out by the beacons. A mathematical model is then used to approximate the distance between the mobile device and the beacon by using the transmitted power level and received signal strength of the Bluetooth signal. A grid can then be used to model a floor of a building with a beacon in each quadrant. Methods of increasing the accuracy of the application include using a density algorithm on a sample of received signals and also a probabilistic algorithm that implements a variation of Bayes theorem.

I. INTRODUCTION

II. RELATED WORK

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REFERENCES

- [1] H. Kopka and P. W. Daly, *A Guide to L^AT_EX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.