

MASTER'S THESIS

A WLAN location estimation system using center of gravity as an algorithm selector

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A WLAN Location Estimation System using Center of Gravity
as an Algorithm Selector

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Abstract

With the prevalence of mobile Wi-Fi devices and infrastructures, there are growing interests in mobile surveillance and device tracking for providing better location-aware services in metropolitan areas. With a good location estimation integrated into a wireless infrastructure, system administrators can closely monitor the behaviors of mobile users as well as provide context-aware services.

The Received Signal Strength(RSS), an easily available information from the IEEE 802.11 family Access Points(APs), has become the most popular research approach for location estimation of a mobile user. But in reality, received signal strength is affected by many factors other than internode distances, such as occlusion, signal deflections and reflections, and the body effect. There had been proposed estimation systems that use the Fingerprinting approach to provide good and accurate location estimation, but such systems have draw-backs from their time-intensive training and retraining process.

The aim of this research, therefore, is to devise a system that minimizes the training and readaptation process while attaining a relatively high accuracy in location estimation.

This thesis proposes a location estimation scheme whose estimation method is based on the Center of Gravity(CG) method. This method also serves as an algorithm selector such that the system can switch to another estimation algorithm if need be. The aim of this system is to reduce the high cost of training and re-calibration but attain an accuracy comparable to the *Fingerprinting* approach.

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