

## MASTER'S THESIS

### Detecting, locating, and tracking mobile user within a wireless local area network

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# **Detecting, Locating, and Tracking Mobile User within a Wireless Local Area Network**

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A thesis submitted in partial fulfillment of the requirements for the degree  
of  
Master of Philosophy

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## **Abstract**

When it comes to positioning technology, people usually think about the Global Positioning System (GPS). However, GPS, although mature enough to be used for navigation and tracking of goods, it is not effective in indoor environment. On the other hand, with the advance in WLAN technology and the popular adoption of wireless equipments and in particular, the IEEE 802.11 family, almost everyone in the community has a Wi-Fi enabled device integrated into their everyday life.

With the prevalence of Wi-Fi activity within a wireless network, there are growing interests in mobile surveillance and device tracking for better network services. With a good location estimation algorithm integrated into a wireless network, system administrators can closely monitor the network traffic as well as the behavior of the mobile users. By modifying the embedded software in off-the-shelf WLAN Access Points (APs), our system can sniff out data packets transmitted by WLAN devices without the need to install client programs on mobile user devices.

Based upon our research result, better design and implementation to our Wireless Location Estimation become our challenging objective. A well designed system will minimize the traffic within the network, as well as the chance of being overload by the estimation system. Since more than a hundred packets are transferred in the air within a second, the huge amount of packet details such as MAC address of the mobile station and the corresponding RSSI find it difficult to be transferred to the data server all at once. The problem is amplified when more than one WLAN APs want to transmit all the packet information to the data server at the same time. Hence, a more technically advance software design in off-the-shelf WLAN APs is needed.

Thus, the design and implementation of an intelligence wireless data summarization, data storage middle-ware machine, optimized data server and location estimation server, are our major concern in terms of stability, flexibility and performance of our location estimation system.

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