

## MASTER'S THESIS

### Wireless LAN positioning in indoor environment

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*Date of Award:*  
2008

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# Wireless LAN Positioning in Indoor Environment

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

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Hong Kong Baptist University

August 2008

# Abstract

The communication technology has explosively grown in last decade, and the rise of the Internet changed the life style of all people on this planet. Nowadays, wireless communication is essential to our daily life. People can retrieve information from the Internet through a mobile device, and we are stepping to the age of ubiquitous computing. In order to provide proper information to users according to their location, we need a positioning system which can estimate the location of a user. Although Global Positioning System (GPS) can provide the location of a user with good precision, it doesn't work when the user stays in an indoor environment. However, the IEEE 802.11 wireless network has become popular in past few years, and most of the urban areas are covered by wireless LAN (WLAN) now, especially the indoor environment, such as commercial buildings and shopping mall. Therefore, a WLAN positioning system can be a solution to provide location based services in the indoor environment.

In this research, we propose a new positioning algorithm which can have higher accuracy in challenging environment, such as library, which has crowded metal bookshelves.

While most of the existing WLAN positioning systems obtain Received Signal Strength (RSS) information at either the access points or at the mobile device, in this research, we propose a new WLAN positioning approach by making use of the RSS collected at both the access points and mobile device and hence, achieving better precision. Moreover, the proposing positioning model is algorithm independent, which means that it can be applied with any RSS-based positioning algorithm. Based on the proposing approach, we developed a WLAN positioning system, which provide two different techniques, Composed Distance and Probability, to utilize the RSS data to enhance the positioning performance.

# Table of Contents

<b>Declaration</b>	<b>i</b>
<b>Abstract</b>	<b>ii</b>
<b>Acknowledgements</b>	<b>iii</b>
<b>Table of Contents</b>	<b>v</b>
<b>List of Tables</b>	<b>viii</b>
<b>List of Figures</b>	<b>ix</b>
<b>List of Symbols</b>	<b>xi</b>
<b>List of Abbreviations</b>	<b>xiii</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Background of Wireless LAN . . . . .	2
1.1.1 Wireless LAN 802.11 a . . . . .	2
1.1.2 Wireless LAN 802.11 b/g . . . . .	2
1.2 Positioning Technology . . . . .	3
1.2.1 Global Positioning System . . . . .	3
1.2.2 Mobile Location Estimation System . . . . .	4
1.2.3 Radio Frequency Positioning System . . . . .	4
1.2.4 Wireless LAN Positioning System . . . . .	5
1.3 Contribution of the Thesis . . . . .	5

1.4	Outline of the Thesis . . . . .	6
<b>2</b>	<b>Multiple Location Fingerprints Algorithm</b>	<b>7</b>
2.1	Related Works . . . . .	8
2.2	Multiple Location Fingerprint Algorithms - The Basic Approach . . . . .	9
2.3	Performance Evaluation of the Basic Approach . . . . .	11
2.3.1	Experiment Setup . . . . .	11
2.3.2	Performance Metrics . . . . .	12
2.3.3	Results and Discussion . . . . .	13
2.4	Multiple Location Fingerprints Algorithm - The Advanced Approach . . . . .	17
2.4.1	Kd-Tree . . . . .	17
2.4.2	New Method To Generate Location Fingerprints . . . . .	18
2.4.3	Estimation Method . . . . .	20
2.4.4	Performance . . . . .	22
<b>3</b>	<b>Wireless LAN Positioning based on Asymmetrical Signal</b>	<b>26</b>
3.1	Related Work . . . . .	27
3.2	Proposed Approach . . . . .	28
3.2.1	Asymmetrical Signal Strength . . . . .	28
3.2.2	Positioning Model . . . . .	29
3.3	Experiment Setup . . . . .	31
3.4	Results and Discussion . . . . .	33
<b>4</b>	<b>Further Investigation on Wireless Positioning System based on Asymmetrical Signal</b>	<b>41</b>
4.1	Related Work . . . . .	41
4.2	Proposed System . . . . .	43
4.2.1	Asymmetrical Signal Strength . . . . .	43
4.2.2	Methodology . . . . .	44
4.3	Performance . . . . .	47
4.3.1	Experiment Setup . . . . .	47

4.3.2	Experimental Results and Analysis . . . . .	50
<b>5</b>	<b>Further Enhancement on Location Estimation</b>	<b>54</b>
5.1	Filling the Missing Values . . . . .	54
5.2	Data Acquisition Method and System . . . . .	58
5.2.1	Passive System . . . . .	59
5.2.2	Active System . . . . .	60
5.2.3	Integrated System . . . . .	60
<b>6</b>	<b>Conclusion and Future works</b>	<b>62</b>
	<b>Curriculum Vitae</b>	<b>70</b>