

MASTER'S THESIS

A dual channel location estimation system for mobile computing

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A Dual Channel Location Estimation System for Mobile
Computing

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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
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Abstract

A dual channel system, which is based on the GPS and the GSM Network, is being investigated to compensate the problem of the lost of GPS signals in providing location services to the mobile users in urban areas. In this design, GSM positioning algorithms will be used as an alternative method to provide location estimations, when GPS signal is lost in blind spot areas. Although GSM positioning algorithms based on signal attenuation may not be the most promising approach for providing location estimation, signal strength however is the only common attribute available among various kind of mobile network. Together with the fact that tall buildings are populated in metropolitan areas like Hong Kong, the cell layout in these areas is different from other cities. This research is an investigation and a revisit in search of a set of location estimation algorithms based on signal attenuation to work with GPS, so as to develop a dual channel positioning system. With the technical support from a local mobile phone operator, we have constructed and conducted several real world experiments for our investigation. The results are promising.

Table of Contents

Declaration	i
Abstract	ii
Acknowledgement	iii
Contents	iv
List of Figures	v
List of Tables	vi
1 Introduction	1
1.1 Background	1
1.2 Motivation	2
1.3 Contributions of the Thesis	3
1.3.1 Dual Channel System Design	3
1.3.2 Algorithms development based solely on the GSM network	4
1.3.3 Algorithm development based on calibration	4
1.4 Outline of the Thesis	4
2 Related Works	5
2.1 Overview of GPS	5
2.2 Overview of GSM	7
2.3 Related Works for GSM Positioning	9
2.3.1 FCC Rules	9
2.3.2 Network-based Technologies	10

2.3.3	Terminal-based Technologies	16
2.4	Circular Trilateration	17
3	The Design of a Dual Channel Positioning System	21
3.1	Overall System Architecture	21
3.1.1	Acquisition of GPS Signal	21
3.1.2	Lost of GPS Signal	22
3.1.3	Network Information from the GSM Network	22
3.2	Problem Identification	25
3.3	Positioning Algorithms based on Center of Gravity (CG)	26
3.3.1	Fine-tunings	27
3.4	Positioning Algorithm from Maximum Likelihood	29
3.4.1	Calibration for each Base Station	30
3.4.2	Calculation of Maximum Probability by Maximum Likelihood	34
3.4.3	Location Estimation System for the Dual Channel System	35
4	Implementation	38
4.1	Technologies behind the implemenation of the Dual Channel System	38
4.1.1	Programming Environment	38
4.1.2	Protocols and Controls	39
4.1.3	Digital Map	41
4.1.4	Standard of GPRMC	45
4.2	Algorithm Development Platform	47
4.3	Application Development Platform	49
5	Experiments	53
5.1	Algorithms Comparison	53
5.1.1	Field Test I	53
5.1.2	Field Test II	73
5.2	Dual Channel System Drive Test	77
6	Conclusion and Future Works	84
A	Detailed Information and Results from Field Test I	86

B Detailed Information and Results from Field Test II	92
C Format of protocol in Nokia 61xx	95
Bibliography	97
Curriculum Vitae	101