

## TABLE OF CONTENTS

STATEMENT .....	iii
ACKNOWLEDGEMENT .....	iv
ABSTRACT .....	vi
TABLE OF CONTENTS.....	viii
LIST OF FIGURES .....	xi
LIST OF TABLES .....	xiv
LIST OF ABBREVIATIONS .....	xv
CHAPTER I INTRODUCTION .....	1
1.1.    Background .....	1
1.2.    Problem Statement .....	5
1.3.    Originality of Research .....	5
1.4.    Research Objectives .....	13
1.5.    Contribution of this Research.....	14
CHAPTER II LITERATURE REVIEW AND THEORETICAL BACKGROUND .....	16
2.1    Literature Review .....	17
2.1.1    Location modeling and representation .....	17
2.1.2    Location context modeling approaches.....	20
2.1.3    Ontology hierarchical location-based service .....	21
2.1.4    Wireless-based Positioning System .....	23
2.1.5    Location determination and taxonomy of positioning .....	23
2.2    Theoretical Background .....	24
2.2.1    Location based service in ubiquitous computing (UbiComp).....	25
2.2.2    Integration of Location Awareness System .....	26

2.2.3	Location Estimation Methods .....	32
2.2.4	Received Signal Strength Indicator (RSSI) positioning fundamental .....	35
2.2.5	Context Awareness Computing .....	37
2.2.6	Fuzzy Logic Adaptive Localization .....	38
2.2.7	Probabilistic Fuzzy Set for Positioning Estimation [92].....	42
	CHAPTER III METHODOLOGY .....	45
3.1	Research methodology .....	45
3.1.1	Review and Literature Study.....	46
3.1.2	Data Collection and Sample Analysis.....	46
3.1.3	Modeling and Conceptual Framework.....	49
3.1.4	Requirement Specification or Behavioural Requirement .....	50
3.2	System Design and Implementation.....	52
	CHAPTER IV DEVELOPING LOCATION MODELS BASED ON ONTOLOGY AND THE PROBABILISTIC RULE.....	58
4.1	Introduction .....	58
4.2	Ontology modeling-based location context .....	59
4.2.1	Implementation of ontology models .....	59
4.2.2	Ontology Model for Locations.....	62
4.3	Probability and Fuzzy Logic Model.....	72
4.4	Application of the ontology model and signal strength model to the proposed system .....	88
4.5	Translation the models into seamless mobility application .....	91
4.6	Summary .....	93
	CHAPTER V INDOOR POSITIONING SYSTEM DEVELOPMENT .....	94
5.1	Introduction .....	94