

Contents

Chapter 1 Introduction

1.1.1 Problem definition.....	01
-------------------------------	----

Chapter 2 Background

2.1 Wireless network sensor.....	03
2.1.1 Sensor & its components.....	03
2.1.2 Sensor Networks.....	04
2.2 Coverage Issue.....	05
2.3 Coverage Holes.....	06
2.4 Sensor Coverage Topology.....	06
2.4.1 Static Network.....	06
2.4.1.1 Single coverage.....	07
2.4.1.2 Multiple coverage.....	07
2.4.2 Mobile Network.....	07
2.4.3 Hybrid Network.....	08

Chapter 3 Coverage Problem

3.1 Coverage hole problem.....	09
3.1.1. Mobile Sensor Networks.....	09
3.1.2. Hybrid Sensor Networks.....	11
3.1.3 Static Sensor Networks.....	12

Chapter 4 Voronoi Diagram

4.1 Introduction to Voronoi Diagram	13
4.2 Technical preliminary on Voronoi Diagram.....	13
4.3 Algorithm Of Voronoi Program.....	15
4.4 Structure of voronoi program.....	16

Chapter 5 Results

5.1 Screen design and functionalities 18

Chapter 6 Protocol for reducing coverage hole area

6.1 Bidding protocol Overview..... 23

6.2 General Idea of the Bidding Protocol..... 23

6.3 Bid Estimation..... 26

6.4 Optimize the greedy heuristic..... 27

6.5 Duplicate Healing Detection..... 28

Chapter 7 Conclusion and Future Work..... 30

References 31

Figures & Tables

Figure1. (1.i): Coverage Hole and (1.ii): No Coverage Hole	01
Figure 2.The components of a typical wireless sensor node.....	04
Figure 3.Architecture of sensor network communication.....	05
Figure 4.(1.i):Coverage Hole and (1.ii): No Coverage Hole	06
Figure 5.Voronoi diagram polygon for node x.....	09
Figure 6.Voronoi diagram.....	14
Figure 7. Addition of a new generator.....	16
Figure 8. The main program screenshot	
Figure 8.1 Fixed Nodes Deployment.....	18
Figure 8.2 Random Nodes deployment.....	19
Figure 8.3 User input deployment in more color mode.....	19
Figure 8.4 Hybrid deployment nodes.....	20
Figure 9. Bar A Histogram presenting percentage of coverage area under coverage by sensor nodes for fixed and random deployment of nodes	21
Figure 10. Reducing to the set-covering problem.....	24
Figure 11.Snapshot of the execution of the bidding protocol.....	25
Figure 12.Bid estimation.....	26
Figure 13.Optimize the greedy heuristic.....	27
Figure 14.Duplicate healing.....	29