Anchor Node Placement for Localization in Wireless Sensor Networks

by

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Abstract

Applications of wireless sensor network (WSN) often expect knowledge of the precise location of the nodes. One class of localization protocols patches together relative-coordinate, local maps into a global-coordinate map. These protocols require nodes that know their absolute coordinates, called anchor nodes. While many factors influence the calculated position errors, in this class of protocols, the placement of these anchor nodes has a significant impact. Through simulation, using the Curviliner Component Analysis (CCA-MAP) protocol, we show the impact of anchor node placement and a set of rules to ensure the best possible outcome.

Dedidcated to my wife and children who supported me through the long process of this research.

Acknowledgments

I would like to thank Professor Thomas Kunz for his guidance and encouragement that made this research possible. Further, I would like to thank Li Li whom, along with Professor Kunz, performed the initial CCA research and wrote the basis for the Matlab simulations used in this thesis. Finally, my colleagues Shafagh Alikhani and Ben Gardiner who provided a tireless ear to listen to ideas throughout the process.

Table of Contents

Chapter 1

Introduction

1.1 Motivation

For the first round of testing, chosen more as an excercise in the simulation analysis package in MATLAB©, 4 anchor nodes are placed at the closest node the the 45-degree axes, with increasing distance from the center. shows the positions for each iteration.

Chapter 2

The Beginning of the Details

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Sub-Sub-Section Heading

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List of References

[1] W. Smith and H. Johnson, "A title of an article," *Journal of Applied Stuff*, vol. 17, pp. 735–744, 1978.

[2] J. Doe and W. Smith, "A conference paper," in *IEEE Conference on Nothing*, pp. 375–380, 1988.

Appendix A

Derivation of Some Nasty Equation

Here is the derivation.