Honeycomb: Location tracking based on Wi-Fi signal strength

by

Michael Linder, B.A.

REPORT

Presented to the Faculty of the Graduate School of
The University of Texas at Austin
in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science in Engineering

THE UNIVERSITY OF TEXAS AT AUSTIN
May 2015

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APPROVED BY

SUPERVISING COMMITTEE:

Christine Julien, Supervisor

William Bard

Dedicated to my wife, Dana, whose support made this possible.

Honeycomb: Location tracking based on Wi-Fi signal strength

Michael Linder, M.S.E.
The University of Texas at Austin, 2015

Supervisor: Christine Julien

This paper presents Honeycomb, a commercially viable location tracking system based on Wi-Fi signal strength. Wireless Local Area Networks are ubiquitous today, which makes them a perfect preexisting infrastructure for localized location tracking. Using Wi-Fi signal strength fingerprinting, Honeycomb harnesses existing Wi-Fi infrastructures as a means to track the movements of individual nodes through a space. Fingerprinting is a method by which Wi-Fi signal strengths are mapped at regular intervals in a bounded space. Once a space is fingerprinted, a given node must simply sample Wi-Fi signal strengths as it moves through the same space and Honeycomb's algorithm will determine the node's path in an offline manner.

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Chapter 1

Introduction

This document deals with how to write a doctoral dissertation using LaTeX, and how to use the `utdiss2` package.

Some intro stuff here [6]

1.1 Signal Strenth vs. RSSI

1.2 Structure of This Paper

In Chapter 2 we discuss background and related work.

In Chapter 3 we discuss BumbleBee, an independent Wi-Fi signal strength measurement tool used to collect user signal strength measurements.

In Chapter 4 we discuss the architecture of Honeycomb and the technologies on which it was built.

In Chapter 5 we discuss testing procedures that were implemented and their results.

In Chapter 6 we discuss the results of our tests and the future of Honeycomb as a product.

Chapter 2

Background and Related Work

2.1 Existing Research

Chapter 3

BumbleBee

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Bibliography

[1] M. J. Bertin et al. *Pisot and Salem Numbers*. user Verlag, Berlin, 1992.

[2] Donald K. Knuth. *The TEXbook*. Addison-Wesley, 1984.

[3] Leslie Lamport. *LATEX: A document preparation system*. Addison-Wesley, 2nd edition, 1994.

[4] F Mittelbach M Goosens and A Samarin. *The LATEXCompanion*. Addison-Wesley, 1994.

[5] Michael Spivak. *The joy of TEX*. American Mathematical Society, Providence, R.I., 2nd edition, 1990.

[6] Alf J. van der Poorten. Some problems of recurrent interest. Technical Report 81-0037, School of Mathematics and Physics, Macquarie University, North Ryde, Australia 2113, August 1981.

Vita

TODO: VITA

Permanent address: mplinder@utexas.edu

This report was typeset with LaTeX† by the author.

†LaTeX is a document preparation system developed by Leslie Lamport as a special version of Donald Knuth's TeX Program.