Supervised Research Exposition Work Report (Spring 2013)

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April, 2013

Abstract

This report enlists the work done as part of my Supervised Research Exposition during the Spring Semester 2013

1 Introduction

My focus was on

- Interference Temperature models, and

- Measurement of Interference Temperature.

The concept of Interference Temperature is not agreed upon by all. As of now the FCC (Federal Communications Commission) has stopped working on it. But this concept has the potential to reappear again if someone is able to come up with a practically and efficiently implementation of it.

2 The work

The work I have done as part of my SRE are as follows:

1. Read the following papers on cognitive radio:

   - Simon Haykin. *Cognitive radio: Brain-empowered wireless communications. IEEE Journal on selected areas in communications*, 23(2), 2005.

   - Ian F. Akyildiz, Won-Yeol Lee, Mehmet C. Vuran, Shantidev Mohanty. *NeXt generation/dynamic spectrum access/cognitive radio wireless networks: A survey*

   These papers talk about cognitive radio as a whole.

2. Read the following papers on Interference Temperature:

- Paul J Kolodzy. *Interference temperature: A metric for dynamic spec- trum utilization.* 2006.

- T. Charles Clancy. *Formalizing the interference temperature model. Wi- ley Journal on wireless communications and mobile computing,* 2006.

These papers are specific to Interference Temperature, a concept used in cognitive radio.

3. To know more about the method called Multi-taper Spectral Estimation, I referred to the following:

- David J Thomson. *Spectrum estimation and harmonic analysis. Proceed- ings of the IEEE,* 70, September 1982.

- [Book] D B Percival and A T Walden. *Spectral Analysis for Physical Applications. Cambridge University Press,* London, UK, 1993.

- [Online] http://en.wikipedia.org/wiki/Multitaper

4. I have written a report summarizing what I learned about different models of interference temperature and about ways to estimating the interference temperature.

5. Towards the end of the semester, having trouble finding IEEE papers focusing solely on the topic of Interference Temperature, I had begun reading about Dynamic Spectrum Access, a technique which makes use of Interference Temperature. The paper is:

Yiping Xing, Chetan N. Mathur, M.A. Haleem, R. Chandramouli, and K.P. Subbalakshmi. *Dynamic Spectrum Access with QoS and Interference Temperature Constraints. IEEE Transactions on mobile computing,* 6(4), April 2007