

SenSIP Graduate Student Seminar Series

Sequential Utility Maximization for Dynamic Spectrum Access

Presenter: Lorenzo Ferrari, PhD Student

April 1 (Friday), 2016, 11:00 AM

Room: GWC 487

Abstract

There is a vast literature that studies optimal sequential sensing policies based on the typical detection metrics of missed-detection and false alarm probabilities. In this talk we introduce and analyze a new formulation of the sequential sensing problem in which the tests are aimed at maximizing a utility function. The utility grows with the remaining time left to exploit the resource tested and decreases with the penalty for using it in the wrong state. We characterize the structure of the optimal strategy as being based on two time-varying thresholds. Since obtaining the optimal thresholds is exponentially-complex we propose an heuristic and show that in our simulations it closely matches the optimal strategy. We finally study the application of our model to a cognitive radio scenario, where a secondary transmitter is seeking transmission opportunities in the spectrum, but it can get penalized for interfering with the primary transmission.



Biography:

Lorenzo Ferrari is a PhD student at Arizona State University, working with Prof. Anna Scaglione. His research interests are in mathematical modeling for signal processing and communication applications, with a focus on dynamic spectrum access. He received his bachelor's and master's degrees in Electrical and Telecommunications Engineering from the University of Modena, Italy in 2012 and 2014. He is the recipient of the IEEE SmartGridComm 2014 Best Student Paper Award for the paper "The Pulse Coupled Phasor Measurement Units".

Refreshments

Upcoming Student Seminars:

Hoi To Wai, *Stochastic Frank-Wolfe Algorithms for High-dimensional Optimization: with applications to online learning and distributed optimization*, 04/08

Henry Braun, *TBA*, 04/15

Weina Wang, *The Value of Privacy: Strategic Data Subjects, Incentive Mechanisms and Fundamental Limits*, 04/29

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