

# **Title: Multiband Parameter Estimation for Spectrum Sensing from Noisy Measurements**

Doctoral Research Seminar Presentation by  
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Abstract: Under a dynamic spectrum access paradigm, a set of  $L$  spectrum bands licensed to primary users provide opportunities for an unlicensed secondary user to gain access to spectrum left idle by a primary user. We model the received noisy signal measurements on each band as a continuous-time Markov chain observed through a discrete-time Gaussian channel. Based on this model, we develop a scheme for estimating the parameters of the subset of  $L^* < L$  bands that offer the “best” opportunities for dynamic spectrum access in the sense of largest mean idle periods. Our approach consists of a Markov modulated Gaussian process model, an associated expectation-maximization algorithm, and a computing budget allocation scheme for allocating sensing effort across the spectrum bands over a sequence of observation intervals. The sensing effort allocation scheme maximizes the probability that the  $L^*$  best bands will be determined from their parameter estimates obtained in the next observation interval. Simulation results are presented to demonstrate the performance of the proposed scheme.