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# SenSIP Seminar Series

## A Step towards Auto ML – Adaptive Sampling and Bayesian Optimization

Presenter: Gowtham Muniraju
PhD Student in ECEE

September 21, 2018, 3:00 PM / Room: GWC 487

### Abstract

A common challenge in machine learning and related fields is the need to efficiently explore high dimensional parameter spaces using small numbers of samples. Typical examples are hyper-parameter optimization in deep learning and sample mining in predictive modeling tasks. All such problems trade-off exploration, which samples the space without knowledge of the target function, and exploitation where information from previous evaluations is used in an adaptive feedback loop. In this talk, I will present an optimal space-filling sample designs for effective exploration of high dimensional spaces and its performance in both data space and model space applications. The data space exploration is targeted at recovering complex regression functions in high dimensional spaces. The model space exploration focuses on selecting hyper-parameters for a given neural network architecture. Empirical studies demonstrate that the proposed approach consistently outperforms state-of-the-art techniques, particularly with smaller design sizes. Finally, I will present how our methods can be incorporated in the Auto ML pipeline.

**Biography:**

Gowtham Muniraju is a PhD student at Arizona State University, co-advised by Dr. Andreas Spanias and Dr. Cihan Tepedelenlioglu. He completed B.E. degree in electronics and communications engineering from Visvesvaraya Technological University, India, in 2016. His research interests include distributed computation in wireless sensor networks, distributed optimization, computer vision and deep learning. This summer, he interned at Lawrence Livermore National Laboratory, where he worked on developing optimal sampling techniques for improved hyper parameter optimization. In recent years, his research involves statistical parameter estimation and clustering in distributed wireless sensor networks.

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