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Seminar

Speaker: **Professor Han Liu**
Department of Operations Research and Financial Engineering
Princeton University

Title**:** **Nonparametric Graphical Model: Foundation and Trends**

Time: **3:20 – 4:20pm, *Wednesday*, November 18, 2015**

Place: **552 Hill Center**

Abstract

We consider the problem of learning the structure of a non-Gaussian graphical model. We introduce two strategies for constructing tractable nonparametric graphical model families. One approach is through semiparametric extension of the Gaussian or exponential family graphical models that allows arbitrary graphs. Another approach is to restrict the family of allowed graphs to be acyclic, enabling the use of fully nonparametric density estimation in high dimensions. These two approaches can both be viewed as adding structural regularization to the general pairwise nonparametric Markov random field and reflect an interesting tradeoff of model flexibility with structural complexity. In terms of graph estimation, these methods achieve the optimal parametric rates of convergence. In terms of computation, these methods are as scalable as the best implemented parametric methods. Such a "free lunch phenomenon" make them extremely attractive for large-scale applications. We will also introduce several new research directions along this line of work, including latent-variable extension, model-based nonconvex optimization, graph uncertainty assessment, and nonparametric graph property testing.

***** Refreshments will be served @2:50pm in Room 502 Hill Center ****