



The University of Chicago
Department of Statistics
Seminar Series

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Graph Estimation

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133 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

The graphical model has proven to be a useful abstraction in statistics and machine learning. The starting point is the graph of a distribution. While often the graph is assumed given, we have been studying the problem of estimating the graph from data. In this talk we present several new nonparametric and semiparametric methods for graph estimation. One approach is a nonparametric extension of the Gaussian graphical model that allows arbitrary graphs. For the discrete Gaussian (Ising model), we use parallel neighborhood selection with $L1$ -regularized logistic regression. Alternatively, we can restrict the family of graphs to spanning forests, enabling the use of fully nonparametric density estimation in high dimensions. When additional covariates are available, we propose a framework for graph-valued regression using recursive partitioning. The resulting methods are easy to understand and use, theoretically well supported, and effective for modeling and exploring high dimensional data. Joint work with Han Liu, Pradeep Ravikumar, Martin Wainwright, and Larry Wasserman.

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