



THE UNIVERSITY OF
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Department of Statistics

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**Network Analysis: Community Detection and Graphon
Estimation**

FRIDAY, January 15, 2016, at 12:00 PM

Math-Stat Building (Stevanovich Center), Room 112, 5727 S. University Ave.

ABSTRACT

Network data analysis is an important area in modern statistics. How to do community detection and parameter estimation in provably optimal ways are two key questions in analyzing network data. In this talk, I will present results for both problems. I will first introduce an efficient two-step algorithm that can achieve the optimal misclassification error for community detection. The procedure consists of a novel spectral initialization step and a majority voting refinement step. I will then formulate the problem of network parameter estimation as nonparametric graphon estimation, and establish its link to nonparametric regression without observing design. The minimax rate of graphon estimation consists of two parts: the nonparametric part and the clustering part. An interesting implication is that the smoothness of the graphon does not affect the minimax rate once it is greater than 1.