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RUTGERS UNIVERSITY

DEPARTMENT OF STATISTICS AND BIOSTATISTICS DEPARTMENT OF COMPUTER SCIENCE

Seminar

Speaker: **Mladen Kolar**
Carnegie Mellon University

Title: **Exploring dynamic complex systems using time-varying networks**

Time: **3:20 – 4:20pm, Wednesday, February 13, 2013**

Place: **552 Hill Center**

Abstract

Extracting knowledge and providing insights into the complex mechanisms underlying noisy high-dimensional data sets is of utmost importance in many scientific domains. Networks are an example of simple, yet powerful tools for capturing relationships among entities over time. For example, in social media, networks represent connections between different individuals and the type of interaction that two individuals have. In systems biology, networks can represent the complex regulatory circuitry that controls cell behavior. Unfortunately the relationships between entities are not always observable and need to be inferred from nodal measurements.

I will present a line of work that deals with the estimation of high-dimensional dynamic networks from limited amounts of data. The framework of probabilistic graphical models is used to develop semiparametric models that are flexible enough to capture the dynamics of network changes while, at the same time, are as interpretable as parametric models. In this framework, estimating the structure of the graphical model results in a deep understanding of the underlying network as it evolves over time. I will present a few computationally efficient estimation procedures tailored to different situations and provide statistical guarantees about the procedures. Finally, I will demonstrate how dynamic networks can be used to explore real world systems.

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

Any inquiries please contact Ms. Arlene Gray at 848-445-7670 or agray@stat.rutgers.edu

