

The Fox School of Business

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Department of Statistics



 Temple University

ANNOUNCES A  
COLLOQUIUM

**Dr. Jun Xie**

*Department of Statistics  
Purdue University*

will speak on

## **Statistical Methods for Inferring Gene Regulatory Modules and Networks**

**Time: 3:00 – 4:00 PM**

**Date: Friday, February 22, 2008**

**Place: Tuttleman Learning Center 304**

### **Abstract**

This talk is about probability and statistical methods for analysis of genomic data. Our focus is on a specific problem of inferring gene regulatory module, which is defined as a set of coexpressed genes that are regulated by a common set of transcription factors (proteins).

We propose a series of statistical methods that combine information from multiple types of genomic data, including DNA sequences, genome-wide location analysis (ChIP-chip experiments), and gene expression microarray. We start with a hidden Markov model of identifying protein binding sites in DNA sequences. The predictions are refined by regression analysis on gene expression microarray data and/or ChIP-chip binding data. In regression analysis, we formulate a variable selection problem and show that all available methods, including standard stepwise selection and LASSO/LARS, may fail to select the right set of covariates, due to complicated interdependence among genes. This biological application posts a challenge in probability and statistics and new methodologies will be of great interest.

**Guest Parking Available in Visitors' Parking Area 3  
(Park Avenue between Cecil B. Moore Avenue & Oxford Street)**