

The University of Chicago

Department of Statistics

Seminar Series

YU MICHAEL ZHU

Department of Statistics

Purdue University

**“Fourier Methods for Estimating Dimension
Reduction Subspaces in Regression”**

MONDAY January 24, 2005 at 4:00 PM
133 Eckhart Hall, 5734 S. University Avenue

Refreshments following the seminar in Eckhart 110.

ABSTRACT

In high dimensional regression, it is important to identify lower dimensional projections that can capture the relationship between the response and the predictors and suggest proper methods or models for subsequent analyses. In this paper, we follow the regression graphics approach for dimension reduction, which does not involve complex parametric or nonparametric model fitting processes. Using the Fourier transform, we propose two methods, FMC and FMM, for recovering the entire central and central mean subspaces, respectively. Under the normality assumption, explicit estimates of the central and central mean subspaces are derived. A bootstrap procedure is used for determining dimensionality and choosing parameters for FMM and FMC. Simulation results and an application to a real data are reported. FMC and FMM demonstrate overall competitive performance compared to SIR, SAVE and other existing methods. The Fourier approach proposed in this paper may provide another perspective on dimension reduction and lead to more powerful tools in the future.