The Fox School of Business

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Department of Statistics

Temple University

ANNOUNCES A
COLLOQUIUM

Dr. Yichao Wu

North Carolina State University

will speak on

Continuously Additive Models for Functional Regression

Time: 1:30 – 2:30 PM
Date: Friday, October 7, 2011
Place: Alter Hall 746

Abstract

We propose Continuously Additive Models (CAM), an extension of additive regression models to the case of infinite-dimensional predictors, corresponding to smooth random trajectories, coupled with scalar responses. As the number of predictor times and thus the dimension of predictor vectors grows larger, properly scaled additive models for these high-dimensional vectors are shown to converge to a limit model, in which the additivity is conveyed through an integral. This defines a new type of functional regression model. In these Continuously Additive Models, the path integrals over paths defined by the graphs of the functional predictors with respect to a smooth additive surface relate the predictor functions to the responses. This is an extension of the situation for traditional additive models, where the values of the additive functions, evaluated at the predictor levels, determine the predicted response. We study prediction in this model, using tensor product basis expansions to estimate the smooth additive surface that characterizes the model. In a theoretical investigation, we show that the predictions obtained from fitting continuously additive estimators are asymptotically consistent. We also consider extensions to generalized responses. The proposed estimators are found to outperform existing functional regression approaches in simulations and in applications to human growth and yeast cell cycle data. This talk is based on joint work with Hans Mueller and Fang Yao.

Guest Parking Available in the **Liacouras Garage**
(Located on **15th Street between Montgomery** and **Cecil B. Moore Avenues**)