The University of Chicago

Department of Statistics

Seminar Series

TONY CAI

Department of Statistics
The Wharton School
University of Pennsylvania

"Prediction In Functional Linear Regression"

MONDAY March 28, 2005 at 4:00 PM
133 Eckhart Hall, 5734 S. University Avenue
Refreshments following the seminar in Eckhart 110.

ABSTRACT

There has been substantial recent work on methods for estimating the slope function in functional linear model. However, much of the practical interest in the slope lies on its application for the purpose of prediction, rather than on its significance in its own right. We show that the problems of slope-function estimation, and of prediction from an estimator of the slope function, have very different characteristics. While the former is intrinsically nonparametric, the latter can be either nonparametric or semiparametric. In particular, the optimal mean-square convergence rate of predictors is n^{-1}, where n denotes sample size, if the predictand is a sufficiently smooth function. In other cases, convergence occurs at an algebraic rate that is strictly slower than n^{-1}. At the boundary between these two regimes, the mean-square convergence rate is less than n^{-1} by only a logarithmic factor. More generally, the rate of convergence of the predicted value of the mean response in the regression model, given a particular value of the explanatory variable, is determined by a subtle interaction among the smoothness of the predictand, of the slope function in the model, and of the autocovariance function for the distribution of explanatory variables. This is joint work with Peter Hall.