

The University of Chicago

Department of Statistics

Seminar

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“Spline Estimation for Single Index Models”

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ABSTRACT

Single index models generalize the linear regression by modeling the conditional mean of the response variable as a unknown function of a linear combination of the covariates (such a linear combination is called a single index). This class of models includes many useful models in Econometrics such as censored and truncated Tobit models, binary choice models, and duration models with unobserved individual heterogeneity and random censoring. Single index models can also be viewed as a dimension reduction tool for multivariate nonparametric regression. By reducing the dimensionality from that of a general covariate vector to a univariate single index, single-index models avoid the "curse of dimensionality." We propose an estimation method of single index models using global smoothing based on polynomial splines. An iterative algorithm which employs the special structure of single index models is given to implement the proposed method. Some related asymptotic results are developed. Both simulated and real data are used to illustrate the proposed method.