An Adaptive Estimation Method for Dimension Reduction with Application to Functional Response Data

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This article concerns the analysis of multivariate response data with high-dimensional covariates. Based on local linear smoothing techniques, we propose an adaptive estimation method to reduce the dimensions of response variables and covariates without requiring a prespecified parametric model. The proposed method is also extended to functional response data for a data-adaptive basis function searching. Instead of focusing on goodness of fit, we shift the problem to reveal the data structure and basis patterns. Several simulation examples are reported for illustration and comparisons are made with sliced inverse regression of Li et al. (2003).

Key Words: Canonical correlation, effective dimension reduction, functional data analysis, local linear smoother, sliced inverse regression