Functional Linear Regression for Functional Response via Sparse Basis Selection

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We study a sparse estimation in functional linear regression model for functional response where the regression coefficient function is generated by a finite number of basis functions. In a similar perspective to variable selection, we construct a sparse basis representation for the coefficient function using penalized least squares method. We simultaneously estimate the regression parameters and select basis functions by two-step procedure. For a given basis, we show that our approach consistently identifies true subset of basis so that the resulting estimator achieves root-n-consistency for the regression parameters.

Key Words: Functional linear regression, basis selection, penalized least squares estimation, group variable selection