

Inverse regression for longitudinal data

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Abstract

Sliced inverse regression is an appealing dimension reduction method for regression models with multivariate covariates. It has been extended to functional covariates where the whole trajectories of random functional covariates are observed completely. We aim at developing an inverse regression approach for intermittently and sparsely measured longitudinal covariates. We show, under some regularity conditions, that the convergence rate of the estimated EDR, effective dimension reduction, directions is a function of smoothing parameters, sample size and the number of eigenfunctions used to reconstruct the empirical inverse of the covariance operator. Simulation studies and data analysis are also provided to demonstrate the performance of our method.