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Spline Confidence Envelopes for Covariance Function in Dense Functional Longitudinal Data

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A405 Wells Hall

10:20 a.m. - 11:10 a.m.

Refreshments: 10:00 a.m.

Abstract

We consider nonparametric estimation of the covariance function for dense functional data using tensor product B-splines. The proposed estimator is computationally more efficient than the kernel-based ones. We develop both local and global asymptotic distributions for the proposed estimator, and show that our estimator is as efficient as an “oracle” estimator where the true mean function is known. Simultaneous confidence envelopes are developed based on asymptotic theory to quantify the variability in the covariance estimator and to make global inferences on the true covariance. Monte Carlo simulation experiments provide strong evidence that corroborates the asymptotic theory. Two real data examples on the near infrared spectroscopy data and speech recognition data are also provided to illustrate the proposed method.

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