

COLLOQUIUM

Envelope model for function-on-function linear regression

Abstract:

The envelope model is a recently developed methodology for multivariate analysis that enhances estimation accuracy by exploiting the relation between the mean and eigenstructure of the covariance matrix. We extend the envelope model to function-on-function linear regression, where the response and the predictor are assumed to be Gaussian random functions in Hilbert spaces. We use a double envelope structure to accommodate the eigenstructures of the covariance operators for both the predictor and the response. The central idea is to establish a one-to-one relation between the functional envelope model and the multivariate envelope model and estimate the latter by existing method. We also developed the asymptotic theories, confidence and prediction bands, an order determination method along with its consistency, and a characterization of the efficiency gain by the proposed model. Simulation comparisons with the standard function-on-function regression and data applications show significant improvement by our method in terms of cross-validated prediction error.

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1-27-22

Place: Zoom

Time: 3:00pm