THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

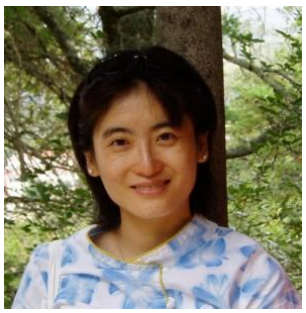
DEPARTMENT OF APPLIED MATHEMATICS
應 用 數 學 系

The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

Network Functional Varying Coefficient Model

By



Prof. Yanyuan MA
Pennsylvania State University

Abstract

We consider functional responses with network dependence observed for each individual at irregular time points. To model both the inter-individual dependence as well as within-individual dynamic correlation, we propose a network functional varying coefficient (NFVC) model. The response of each individual is characterized by a linear combination of responses from its connected nodes and its own exogenous covariates. All the model coefficients are allowed to be time dependent. The NFVC model adds to the richness of both the classical network autoregression model and the functional regression models. To overcome the complexity caused by the network inter-dependence, we devise a special nonparametric least squares type estimator, which is feasible when the responses are observed at irregular time points for different individuals. The estimator takes advantage of the sparsity of the network structure to reduce the computational burden. To further conduct the functional principal component analysis, a novel within-individual covariance function estimation method is proposed and studied. Theoretical properties of our estimators are analyzed, which involve techniques related to empirical processes, nonparametrics, functional data analysis and various concentration inequalities.We analyze a social network data to illustrate the powerfulness of the proposed procedure.

Biography

Dr. Yanyuan Ma is professor of statistics at Penn State University. She obtained her Bachelor from Beijing University and PhD from MIT. Her research interests include Measurement error models, Dimension reduction, Mixed sample problems, Latent variable models, Selection bias and case-control data treatment, and Semiparametrics. She has published extensively in prestigious theoretical and applied statistics journals such as JASA, JRSS-B, Annals of Statistics, Biometrika, Annals of Applied Statistics, Statistics in Medicine, and JRSS-C. She is currently a fellow of the Institute of Mathematical Statistics and the American Statistical Association.

Date: 6 February 2023 (Monday)
Time: 16:00-17:00 (Hong Kong Standard Time GMT +8)
Venue: Online Talk via Zoom (Meeting ID: 982 0367 5361; Passcode: 0206)
Speaker: Prof. Yanyuan Ma, Pennsylvania State University
Host: Prof. Xingqiu Zhao, The Hong Kong Polytechnic University
Click to join:
https://polyu.zoom.us/j/98203675361?pwd=NlphVVBUeU95aGlvbzcrZ2psdnNoQT09

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