THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF APPLIED MATHEMATICS
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The Hong Kong Polytechnic University
Department of Applied Mathematics

AMA Distinguished Seminar Series in Data Science and Machine Learning

Modelling Matrix Time Series via a Tensor CP-Decomposition

By

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Abstract

We consider to model matrix time series based on a tensor CP-decomposition. Instead of using an iterative algorithm which is the standard practice for estimating CP-decompositions, we propose a new and one-pass estimation procedure based on a generalized eigenanalysis constructed from the serial dependence structure of the underlying process. To overcome the intricacy of solving a rank-reduced generalized eigenequation, we propose a further refined approach which projects it into a lower-dimensional full-ranked eigenequation. This refined method significantly improves the finite-sample performance of the estimation. The asymptotic theory has been established under a general setting without the stationarity. It shows, for example, that all the component coefficient vectors in the CP-decomposition are estimated consistently with certain convergence rates. The proposed model and the estimation method are also illustrated with both simulated and real data, showing effective dimension-reduction in modelling and forecasting matrix time series. (Joint work with Jinyuan Chang, Jing He and Lin Yang)

Biography

Prof. Qiwei Yao is Professor of Statistics at London School of Economics and Political Science. He has held a Chair in Statistics at the LSE since 2002, and was the head of the Statistics department during 2006-2009. He also held the Saw Swee Hock Professorship of Statistics (2020) at the National University of Singapore. Prof. Yao is an internationally renowned statistician with substantial contributions in different areas including time series analysis, spatio temporal modelling, financial econometrics, and nonparametric regression. He is a fellow of the Institute of Mathematical Statistics and of the American Statistical Association, and was awarded the International Chinese Statistical Association Outstanding service Award in 2015. Prof. Yao is currently the joint editor of the Journal of the Royal Statistical Society, Series B, and served as associate editor for many renowned journals such as The Annals of Statistics, and the Journal of the American Statistical Association.

Date: 16 August 2022 (Tuesday)
Time: 16:30-17:30 (Hong Kong Standard Time GMT +8)
Venue: Online Talk via Zoom (Meeting ID: 924 9261 1346)
Speaker: Prof. Qiwei Yao, London School of Economics
Host: Prof. Jian Huang and Dr. Binyan Jiang, The Hong Kong Polytechnic University
Click to join:
https://polyu.zoom.us/j/92492611346?pwd=blJMMDVJTVFnbDYwdTEySGs3ZUlqdz09

Click to join (Zoom)

*** * * ALL ARE WELCOME * * ***

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