## Saw Swee Hock Public Lecture

# Autoregressive Networks


## by Professor Qiwei Yao

*Professor*
*Department of Statistics*
*The London School of Economics and Political Science*


**July 27, 2022 (Wednesday)**
4:00pm - 5:00pm

By Zoom: **https://hku.zoom.us/j/93579081781**
Meeting ID: 935 7908 1781

***About the Talk***

We propose a first-order autoregressive model for dynamic network processes in which edges change over time while nodes remain unchanged. The model depicts the dynamic changes explicitly. It also facilitates simple and efficient statistical inference such as the maximum likelihood estimators which are proved to be (uniformly) consistent and asymptotically normal. The model diagnostic checking can be carried out easily using a permutation test. The proposed model can apply to any Erd\"os-Renyi network processes with various underlying structures. As an illustration, an autoregressive stochastic block model has been investigated in depth, which characterizes the latent communities by the transition probabilities over time. This leads to a more effective spectral clustering algorithm for identifying the latent communities. Inference for a change-point is incorporated into the autoregressive stochastic block model to cater for possible structure changes. The developed asymptotic theory as well as the simulation study affirm the performance of the proposed methods. Application with three real data sets illustrates both relevance and usefulness of the proposed models.
Joint work with Binyan Jiang and Jialiang Li.

***About the Speaker***

Yao Qiwei is Professor of Statistics at London School of Economics and Political Science. Professor Yao has held a Chair in Statistics at the LSE since 2002. He was head of department from 2006 to 2009. He is an internationally renowned statistician and has outstanding editorial experience. He is currently the joint editor of the Journal of the Royal Statistical Society, Series B. He has also served as associate editor for journals including Annals of Statistics, Journal of the American Statistical Association, Journal of the Royal Statistical Society Series B, and have been co-editor for four other journals. Professor Yao 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. He also held the Saw Swee Hock Professorship of Statistics (2020) at the National University of Singapore. Professor Yao's current research interests include time series analysis; high-dimensional time series modelling and forecasting; dimension reduction and factor modelling; dynamical network modelling; spatio temporal modelling; financial econometrics; nonparametric regression.

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All interested are welcome

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