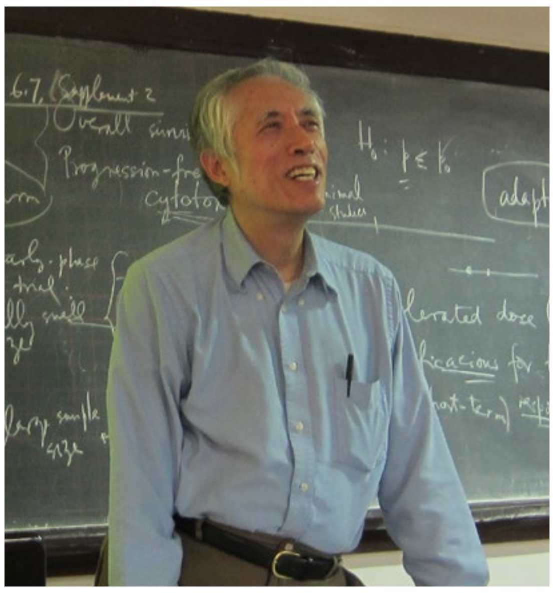
Distinguished Visitor Lecture Series

NUS National University of Singapore | IMS Institute for Mathematical Sciences



Tze Leung Lai
Stanford University

Tze Leung Lai is the Ray Lyman Wilbur Professor of Statistics and by courtesy, also of Biomedical Data Science, and Computational & Mathematical Engineering at Stanford University, where he is the Director of Financial and Risk Modelling Institute (FARM), Co-director of the Center for Innovative Study Design (CISD) and core member of the Comprehensive Cancer Institute, Center for Innovation in Global Health, Center for Precision Mental Health and Wellness, and Center for Population Health Sciences in the School of Medicine, and an advisory committee member of the Bing Overseas Program (BOSP) in Hong Kong. Before moving to Stanford in 1987, he was the Higgins Professor of Statistics at Columbia University where he received his Ph.D. and an Assistant Professor appointment in 1971 and was promoted to Professor in 1977. He received the COPSS (Committee of Presidents of Statistical Societies) Award in 1983 and was elected to Academia Sinica in 1994. He is also the honorary dean of the Center for Financial Technology & Risk Analytics at Fudan University, a visiting chair professor of Southwestern University of Finance and Economics, and an advisory committee member of the Yau Center for Mathematical Sciences at Tsinghua University, the Center for Statistical Science at Peking University, the Department of Statistics and Actuarial Science at The University of Hong Kong (where he received his B.A degree, First Class Honors, in Mathematics in 1967), and the Institute of Statistical Science, Academia Sinica in Taiwan. He has published over 300 papers and 12 books, and has supervised 73 Ph.D. these at Columbia, Stanford, and Stony Brook and University of Padova in Italy (where he visited).

27 February 2019 (Wednesday)
2.00 – 3.00pm

Real World Data, Real World Evidence, and Decision Analytics for Precision Medicine and Health

Venue:
Block S16, #06-118, Seminar Room
Department of Statistics and Applied Probability
National University of Singapore
6 Science Drive 2, Singapore 117546

Real world data (RWD) and real world evidence (RWE) have been increasingly used in health care decision-making since the passage of the 21st Century Cures Act on December 9, 2016, which requires the FDA to develop a framework and guidance for evaluating RWD and RWE to support approvals of new drugs or devices, or new indications for previously approved drugs, and to support post-approval studies for monitoring safety and adverse events for regulatory decision-making. Whereas pharmaceutical companies use RWD and RWE to support clinical development activities and to provide evidence to inform health technology assessment (HTA) decisions, the healthcare community uses RWD and RWE to develop guidelines and decisions to support medical practice and to assess treatment patterns, costs and outcomes of interventions. Although high-speed computing tools and machine learning algorithms have been conveniently applied to RWD, there are still substantial challenges in deriving RWE from RWD and using the RWE in healthcare decision-making. We discuss how recent advances in statistical science can be combined with domain knowledge to address these challenges.

28 February 2019 (Thursday)
9.00 – 10.00am

Latent State Modeling in Mobile Health and Diagnostic Classification: Recent Advances in the MCMC Approach

Venue:
Auditorium
Institute for Mathematical Sciences
National University of Singapore
3 Prince George's Park, Singapore 118402

We first describe the important role of latent state modeling in mobile health and in diagnostic classification/rating, together with hidden Markov models and MCMC methods for these applications. Motivated by applications to adaptive filtering that involves joint parameter and state estimation in hidden Markov models, we describe a new approach to MCMC which uses sequential state substitutions for its Metropolis-Hastings-type transitions. The basic idea is to approximate the target distribution by the empirical distribution of N representative atoms, chosen sequentially by an MCMC scheme so that the empirical distribution converges weakly to the target distribution as the number K of iterations approaches infinity, with an optimal rate of convergence. Implementation details and concrete applications are also provided.

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