

The 1st Pao-Lu Hsu Lecture at Peking University

Time: 4:00pm-5:00pm, Tuesday July 13, 2010

Place: #1 Science Building 1114, PKU (理科一号楼1114)

Speaker: Tze Leung Lai

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Abstract:

Hsu and Robbins (1948) introduced the concept of complete convergence of a sequence of random variables to sharpen almost sure convergence. They and later Erdos (1949) proved that the sample mean of i.i.d. random variables converges to the population mean completely if and only if the i.i.d. random variables have a (common) finite second moment, thereby providing a definitive counterpart of Kolmogorov's strong law of large numbers for complete convergence. We give a review of (a) subsequent developments and refinements of this result in probability theory and (b) its applications to sequential analysis in statistics. While Hsu and Robbins were motivated by the convergence rate for tail probabilities of sample means, one often needs in applications the numerical values of these tail probabilities. The second part of the talk describes recent developments in efficient importance sampling and sequential importance sampling with resampling for Monte Carlo computation of the tail and boundary crossing probabilities of random walks in complex multivariate and Markovian settings, and more generally of rare event probabilities in insurance and finance and in queueing and communication networks, showing the rich legacy of Hsu's seminal works in random walks and multivariate analysis.

Biosketch:

Tze Leung Lai is Professor of Statistics, and by courtesy, also of Health Research and Policy and of the Institute of Computational and Mathematical Engineering at Stanford University. He is the Director of the Financial Mathematics Program, and Co-director of the Biostatistics Core of the Cancer Center and the Center for Innovative Study Design of the School of Medicine at Stanford. He has published 8 books and over 250 papers in probability and statistics and their applications to the biomedical sciences, engineering, economics and finance, and has supervised over 50 Ph.D. theses at Columbia and Stanford, where he has been on the faculty from 1971 to 1987 and since 1987, respectively. He

was born in Hong Kong, received his B.A. (First Class Honours) in mathematics from The University of Hong Kong in 1967, and his M.A. in 1970 and Ph.D. in 1971 from Columbia University in mathematical statistics. He received the COPSS Award and the Guggenheim Fellowship in 1983, Abraham Wald Prize in 2005, and is an elected member of Academia Sinica, where he is also an advisory board member of the Institute of Statistical Science. He is a member of the international advisory committee of the Center for Statistics at Peking University, and is a C.V. Starr Visiting Professor and advisory committee member of the Institute of Mathematical Research and Department of Statistics and Actuarial Science at The University of Hong Kong.