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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SPECIAL COLLOQUIUM

Recent developments on Finite mixture models

By

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The University of British Columbia

Abstract

Finite mixture models are formed by convex combinations of distributions from classical distribution families. They are particularly well suited for modeling populations with homogeneous subpopulations and for accurately approximating a wide range of distributions. However, statistical inference for finite mixture models encounters numerous unexpected challenges. Given a set of independent and identically distributed observations of increasing size, consistent estimation of the mixing distribution can only be achieved at a much slower rate than usual. The likelihood function in normal mixture models is unbounded, which debilitates maximum likelihood estimation in a general sense. Additionally, the likelihood ratio statistic for testing hypotheses on the number of subpopulations may diverge to infinity, instead of having the usual chi-square limiting distribution. In this presentation, we will review various advances in the consistent estimation of mixing distributions and in testing hypotheses concerning the number of subpopulations. We will also briefly discuss some recent developments related to distributed learning and its robust version, where finite mixture ideas continue to play an important role.

Bio: Professor Jiahua Chen, Fellow of the Royal Society of Canada (RSC) and Canada Research Chair (Tier I) in Statistics, is a distinguished statistician and faculty member in the Department of Statistics at the University of British Columbia. His research spans finite mixture models, statistical genetics, empirical likelihood, survey methodology, and experimental design. He has made fundamental contributions to statistical methodology, including introducing empirical likelihood to survey sampling, inventing the EM test for finite mixture models, and developing the extended Bayesian information criterion (EBIC) for variable selection in large model spaces. In recognition of his impact, Professor Chen was elected a Fellow of the Royal Society of Canada in 2022, one of the highest honours in Canadian academia. He is also a Fellow of the Institute of Mathematical Statistics and the American Statistical Association. His work has earned him numerous prestigious awards, including the CRM-SSC Prize in Statistics and the Gold Medal of the Statistical Society of Canada in 2014, the SSC's highest honor. In 2016, he received the International Chinese Statistical Association Distinguished Achievement Award.

Date : 28 May 2026 (Thursday)
Time : 3:00p.m.-4:00p.m.
Venue : Room 1409 (near lift 25 & 26)

All Are Welcome!