

SCHOOL OF DATA SCIENCE

SEMINAR SERIES

Community Detection with Dependent Connectivity

Date: 27 December 2018 (Thursday)
Time: 4:00pm to 5:00pm
Venue: P7303, 7/F, Yeung Kin Man Academic Building (YEUNG),
City University of Hong Kong

Professor Qu, Annie
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Guest Speaker's profile

Prof. Qu is the Brad and Karen Smith Professor of Statistics, and the Director of the Illinois Statistics Office at the University of Illinois at Urbana-Champaign. She received her Ph.D. in Statistics from Penn State in 1998. Her research interests include machine learning, medical imaging, recommender system, natural language processing, personalized medicine, longitudinal/correlated data analysis, missing data, model Selection and nonparametric models. Prof. Qu received an NSF Career award in 2004-2009. She is a fellow of the Institute of Mathematical Statistics and of the American Statistical Association, and the past Chair of the Statistics Learning and Data Science Section of the American Statistical Association.

Abstract

In network analysis, it is common that within community is more likely connected than between community, which is reflected by the edges within a community are more correlated. However, the traditional probabilistic models for community detection like stochastic block model (SBM) are not able to capture the dependence among edges. The revised SBM based on random effects can only handle exchangeable dependence structure on whole networks. In this talk, we propose a new community detection approach based on the Bahadur representation to utilize the within-community dependence of connectivity. The proposed method allows for the heterogeneity among edges and provides greater flexibility in handling different types of within-community dependence structure. In addition, the proposed algorithm does not involve specifying the likelihood function that could be intractable when correlations exist among edges. We demonstrate the application of the proposed method to the agricultural product trading networks. This is joint work with Yubai Yuan.