中央研究院統計科學研究所
短期課程與主編分享

演 講 人：Prof. Ji Zhu

Department of Statistics, University of Michigan, Ann Arbor

時 間：2025-04-16 (Wed.) 10:00-17:00

地 點：Auditorium, B1F, Institute of Statistical Science

備 註：Online live streaming through Cisco Webex will be available.

Webex

Time	Topic
09:40~10:00	Tea reception
10:00~12:00	Statistical Inference on Latent Space Models for Network Data (I)
12:00~13:45	Lunch
14:00~16:00	Statistical Inference on Latent Space Models for Network Data (II)
16:10~17:00	擔任《AOAS》與《JMLR》期刊主編之經驗交流與期刊介紹

Abstract

Recent advances in computing and measurement technologies have led to an explosion in the amount of data with network structures in a variety of fields including social networks, biological networks, transportation networks, the World Wide Web, and so on. This creates a compelling need to understand the generative mechanism of these networks and to explore various characteristics of the network structures in a principled way. Latent space models are powerful statistical tools for modeling and understanding network data. While the importance of accounting for uncertainty in network analysis is well recognized, current literature predominantly focuses on point estimation and prediction, leaving the statistical inference of latent space network models an open question. In this talk, I will present some of our recent work that aims to fill this gap by providing a general framework for analyzing the theoretical properties of the maximum likelihood estimators for latent space network models. In particular, we establish uniform consistency and individual asymptotic distribution results for latent space

network models with a broad range of link functions and edge types. Furthermore, the proposed framework enables us to generalize our results to the sparse and dependent-edge scenarios. Our theories are supported by simulation studies and have the potential to be applied in downstream inferences, such as link prediction and network-assisted supervised learning. In addition, a few other selected topics in statistical network analysis will also be discussed.

Brief bio: Ji Zhu is the Susan A. Murphy Collegiate Professor of Statistics at the University of Michigan, Ann Arbor. He received his B.Sc. in Physics from Peking University, China in 1996 and M.Sc. and Ph.D. in Statistics from Stanford University in 2000 and 2003, respectively. His primary research interests include statistical machine learning, high-dimensional data modeling, statistical network analysis, and their applications to health and natural sciences. He received an NSF CAREER Award in 2008 and was elected as a Fellow of the American Statistical Association in 2013 and a Fellow of the Institute of Mathematical Statistics in 2015. From 2014 to 2020, he was recognized as an ISI Highly Cited Researcher by Web of Science, which annually lists leading researchers in the sciences and social sciences worldwide. In 2022, he received the International Chinese Statistical Association Pao-Lu Hsu Award. He served as the Editor-in-Chief of the Annals of Applied Statistics from 2022 to 2024.

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