The Hong Kong Polytechnic University
Department of Applied Mathematics

AMA Distinguished Seminar Series in Data Science and Machine Learning

Sparse Models for Sparse Networks

By

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Abstract

Network data are frequently collected in modern society and science. Stylized features of a typical network include network sparsity, degree heterogeneity and homophily among many others. This talk introduces a framework with a class of sparse models that utilize parameters to explicitly account for these network features. In particular, degree heterogeneity is handled by node-specific parameters while homophily is captured by the use of covariates. To avoid over-parametrization due to the former, we differentially assign parameters to nodes that are important in certain sense. We start by discussing the sparse β model when no covariates are present, and proceed to discuss a generalized model to include covariates. Interestingly for the former we can use ℓ_0 penalization to identify and estimate the heterogeneity parameters, while for the latter we resort to penalized logistic regression with an ℓ_1 penalty, thus immediately connecting our methodology to the lasso literature. Along the way, we demonstrate the fallacy of what we call data-selective inference, a common practice in the literature to discard less well-connected nodes in order to fit a model, which can be of independent interest.

Biography

Chenlei Leng, Professor of Statistics at the University of Warwick, is a Fellow of the Institute of Mathematical Statistics, an Elected Member of the International Statistical Institute, and a Turing Fellow of the Alan Turing Institute. He received a bachelor's degree in Mathematics from the University of Science and Technology of China (USTC) and PhD in Statistics from the University of Wisconsin-Madison. His research interests include high-dimensional data, statistical learning, and network data analysis.

Date: 7 October 2022 (Friday)
Time: 16:30-17:30 (Hong Kong Standard Time GMT +8)
Venue: Online Talk via Zoom (Meeting ID: 944 2501 4338)
Speaker: Prof. Chenlei Leng, University of Warwick
Host: Prof. Xingqiu Zhao, The Hong Kong Polytechnic University
Click to join:
https://polyu.zoom.us/j/94425014338?pwd=dEJYZS9ZckpqT25pbDcvVXErTXVZdz09

Click to join (Zoom)

＊＊＊ ALL ARE WELCOME ＊＊＊

For enrolment, please send your name and email to wai-yan.moon@polyu.edu.hk on or before 6 October 2022