THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON STATISTICS AND DATA SCIENCE

High-dimensional Gaussian Graphical Regression Models with Covariates

By

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Abstract

Though Gaussian graphical models have been widely used in many scientific fields, relatively limited progress has been made to flexibly link graph structures to external covariates. In this talk, we describe a new Gaussian graphical regression model that relates the conditional dependence structure to covariates, discrete and continuous, of high dimensions. In the context of co-expression quantitative trait locus (QTL) studies, our method can determine how genetic variants and clinical conditions modulate the subject-level gene co-expressions and recover both the population-level and subject-level gene co-expression networks. Under the proposed framework, we address problems including efficient computation with a simultaneous sparsity structure, and error rate and variable selection consistency quantification. Finally, the utility of our proposed method is demonstrated through an application to a co-expression QTL study with brain cancer patients.

Biography
Dr. Emma Jingfei Zhang is an Associate Professor of Information Systems & Operations Research at the Goizueta Business School of Emory University. She also holds a secondary appointment in the Department of Biostatistics & Bioinformatics at the Rollins School of Public Health of Emory University. Her research focuses on the developments of statistical methods and theory for networks, graphs, tensors, and point processes, with applications in biology, medicine, and business. She serves as an associate editor of the Annals of Applied Statistics, Computational Statistics & Data Analysis, Statistica Sinica and the Journal of American Statistical Association, Theory and Methods.

Date	**:**	**6 December 2023 (Wednesday)**
Time	**:**	**11:00am**
Venue	**:**	**Room 5508 (Lifts 25/26)**

All are Welcome!