THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PHD STUDENT SEMINAR

Community Detection on Mixture Multi-Layer Networks via Regularized Tensor Decomposition

By

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Abstract

We study the problem of community detection in multi-layer networks, where pairs of nodes can be related in multiple modalities. We introduce a general framework, i.e., mixture multi-layer stochastic block model (MMSBM), which includes many earlier models as special cases. We propose a tensor-based algorithm (TWIST) to reveal both global/local memberships of nodes, and memberships of layers. We show that the TWIST procedure can accurately detect the communities with small misclassification error as the number of nodes and/or number of layers increases. Numerical studies confirm our theoretical findings. To our best knowledge, this is the first systematic study on the mixture multi-layer networks using tensor decomposition. The method is applied to two real datasets: worldwide trading networks and malaria parasite genes networks, yielding new and interesting findings.

Date : 3 May 2021 (Monday)

Time : 4:30pm

Zoom Meeting : https://hkust.zoom.us/j/99057265284 (Passcode: 123456)

All are Welcome!