HKUST ECON Seminar

6 March, 2026 (Friday), 3:00 – 4:30pm

Estimating Stochastic Block Models in the Presence of Covariates (joint with Louise Laage)

by

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Abstract:

In the standard stochastic block model for networks, the probability of a connection between two nodes, often referred to as the edge probability, depends on the unobserved communities each of these nodes belongs to. We consider a flexible framework in which each edge probability, together with the probability of community assignment, are also impacted by observed covariates. We propose a computationally tractable two-step procedure to estimate the conditional edge probabilities as well as the community assignment probabilities. The first step relies on a spectral clustering algorithm applied to a localized adjacency matrix of the network. In the second step, k-nearest neighbor regression estimates are computed on the extracted communities. We study the statistical properties of these estimators by providing non-asymptotic bounds.