



The Hong Kong University of Science & Technology

Department of Mathematics

PhD Student Seminar

**Semi-supervised learning on unbalanced
heterogeneous networks**

By

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Abstract

Previous work on network analysis focused mainly on community detection, where the main target is to do unsupervised learning or clustering on networks. Recently, semi-supervised learning have received increasing attention amongst researchers. In this paper, we propose a new algorithm, called GII, for predicting labels in partially labeled networks by combining two kinds of normalized Laplacian inverse matrices to measure the closeness between nodes. The idea comes from the first hitting time in random walk, and it also has nice interpretations both in information propagation and regularization framework. In addition, we propose partially labeled degree corrected block model (pDCBM) to describe the generation of partially labeled networks. We show that GII ensures the misclassification rate of order $O(\frac{1}{d})$, for the pDCBM with average degree $d = \Omega(\log n)$ and GII can handle more unbalance issue than traditional Laplacian kernel. GII out performs other state of art methods in most simulations and real datasets, especially in unbalance networks and heterogeneous networks with tiny rate of revealed labels.

Date: Wednesday, 25 April 2018

Time: 3:30 p.m.- 4:30 p.m.

Venue: Room 2126B (near lift 19)

All are welcome!