The Community Structure of Complex Networks

Tiejun Li
Peking University, China
tieli@pku.edu.cn

Given a large and complex network, we would like to find the best partition of this network into a small number of clusters. This question has been addressed in many different ways. In this talk we propose a strategy along the lines of optimal prediction for the Markov chains associated with the dynamics on these networks. We develop the necessary ingredients for such an optimal partition strategy and we compare our strategy with the previous ones. We show that when the Markov chain is lumpable, we recover the partition with respect to which the chain is lumpable. We also discuss the case of well- clustered networks. Finally, we illustrate our strategy on several examples.