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Community Detection in Networks: Spectral Clustering and Beyond

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Date and Time: Friday, 20 September 2019, 4:30-5:30pm
Venue: Room B6605, City University of Hong Kong
Reception starts at 4:15pm
(Language: **English**)

Abstract

With applications ranging from social network analysis to network synchronization, the community detection problem has attracted a widespread interest in the past two decades. Nevertheless, the existing algorithms tend to focus on the specific problem of disjoint community detection in undirected networks. This is the case for the traditional cut-based spectral clustering algorithms that are well known for their efficiency and their strong theoretical foundation. However, the assumptions of these algorithms are restrictive since many real-world networks naturally involve overlapping communities, and, on the other hand, some networks involved unidirectional connections. In this seminar presentation, two new spectral algorithms for community detection will be introduced. These methods extend the traditional spectral clustering algorithms for overlapping community detection and community detection in directed networks, respectively. The proposed algorithms are able to extract meaningful communities from real-world networks including social networks, lexical networks, and trophic networks. We will also provide an overview of the principles, methods and applications of the community detection task with a special emphasis on spectral algorithms.

About the Speaker

Hadrien Van Lierde received the PhD degree from the Department of Electrical Engineering of the City University of Hong Kong, Hong Kong, in 2019. Prior to that, he received the BSc and M. Eng. degrees in Applied Mathematics from Universite Catholique de Louvain, Louvain-la-Neuve, Belgium, in 2013 and 2015, respectively. His research interests include complex network analysis, machine learning, and graph-based algorithms design for natural language processing.

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