

CS Seminar

Cheeger-Type Inequalities Using Reweighted Eigenvalues

**Professor Lap Chi LAU,
School of Computer Science,
University of Waterloo**

Date & Time:
Aug 10, 2023 (Thursday)
2:30 - 3:30pm (HKT)

Venue:
**Rm 417, Chow Yei Ching
Building, HKU**

Abstract:

Cheeger's inequality is a fundamental result in spectral graph theory connecting the edge conductance of an undirected graph to the second eigenvalue of its Laplacian matrix. In this talk, we will present a unifying approach to prove Cheeger-type inequalities in more general settings using the concept of reweighted eigenvalues. This provides a new spectral theory for vertex expansion, for directed graphs, and for hypergraphs, that is much closer to the spectral theory for undirected graphs that were previously known. An interesting consequence is a characterization of the fastest mixing time of a directed graph by its vertex expansion. Joint work with Tsz Chiu Kwok, Kam Chuen Tung, and Robert Wang.

Biography

Lap Chi is a faculty member at the School of Computer Science at University of Waterloo since August 2015. He was a visiting researcher in the Simons Institute at UC Berkeley from Aug 2014 to June 2015.

Before joining University of Waterloo, he was a faculty member in CSE CUHK and the coach of the ACM-ICPC programming team from 2007 to 2014.

He was a visiting researcher of Microsoft Research New England during Jan-Jun 2009. Lap Chi grew up in Hong Kong and received his B.Sc. degree from CSE CUHK. He received his M.Sc. and Ph.D. degrees from the University of Toronto. During his graduate study, he worked in the Theory Group of Microsoft Research in Redmond for three summers, and in the Egrevary Research Group on Combinatorial Optimization (EGRES) in Budapest for two winters.

All are welcome!

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