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香港中文大學
The Chinese University of Hong Kong

Institute of Theoretical Computer Science and Communications

ITCSC Seminar

CSPs and Expansion

By

Prof. Madhur Tulsiani

Associate Professor, Toyota Technological Institute at Chicago

2 July 2019, Tuesday

2:00 pm – 3:00 pm

Room 121, 1/F, Ho Sin Hang Engineering Building, CUHK

Abstract:

Constraints Satisfaction Problems (CSPs) play an important role in the theory of approximability. They provide an important benchmark combinatorial optimization problem for algorithms, as well as equivalent formulations of questions about Probabilitically Checkable Proofs (PCPs) which are used to prove lower bounds on approximability.

It is relatively well understood that if an instance of a 2-CSP (having two variables in each constraint) is considered as a graph, then the expansion of this graph can be exploited by approximation algorithms - I will discuss some instances of this which led to new algorithms in the past.

I will also discuss new notions of expansion (for hypergraphs) defined recently (known as high-dimensional expansion) which can be exploited by algorithms for k-CSPs for k > 2. I will also discuss applications of these algorithmic results to questions in coding theory.

Based on joint works with Vedat Levi Alev, Fernando Granha Jeronimo, Dylan Quintana and Shashank Srivastava.

Biography:

Madhur did his bachelor's in Computer Science at IIT Kanpur (2001-05) and a Ph.D. at UC Berkeley (2005-09) advised by Luca Trevisan. He also spent two years as a postdoc at the Institute for Advanced Study and Princeton University.

He is interested in Theoretical Computer Science, particularly in Complexity Theory.

******* ALL ARE WELCOME *******

Hosted & Enquiries : Prof Andrej Bogdanov / Institute of Theoretical Computer Science and Communications Tel: 3943 4261/3943 3452