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香港中文大學
The Chinese University of Hong Kong

Institute of Theoretical Computer Science and Communications

ITCSC-CSE Joint Seminar

Majority is incompressible by AC^0[p] circuits

By
Mr. Igor Oliveira
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October 21, 2014, Tuesday
3:00 pm – 4:00 pm
Room 1021B, 10/F, Ho Sin Hang Engineering Building, CUHK

Abstract:
Razborov/Smolensky (1987) obtained lower bounds on the size of depth-d Boolean circuits extended with modulo p gates computing the Majority function. This result remains one of the strongest lower bounds for an explicit Boolean function. In this work, we obtain information about the structure of polynomial-size Boolean circuits with modulo p gates computing Majority. For instance, we show that for any d, at least n/((log n)^O(d)) wires must enter the d-th layer of the circuit, which is essentially optimal. This result follows from the investigation of a more general framework called interactive compression games (Chattopadhyay and Santhanam, 2012), which combines computational complexity and communication complexity, and has applications in cryptography, parameterized complexity and circuit complexity. In this talk, we will discuss new results in this model, and mention a few open problems.

Joint work with Rahul Santhanam.

Biography:
Igor Oliveira is a Ph.D. student at Columbia University, where he is jointly advised by Rocco Servedio and Tal Malkin. Before that, he was a student at University of Campinas, Brazil. His research interests lie in complexity theory, combinatorics, and mathematical logic.

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

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