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THE CHINESE UNIVERSITY OF HONG KONG

Department of Information Engineering

Seminar

Asynchronous opinion dynamics and the overhang problem

By

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Date : 29 November 2024 (Friday)

Time : 3:30pm – 4:30pm

Venue : Rm C1, G/F, Lady Shaw Building, CUHK

Abstract

In several settings, including sensor networks and social networks, individual nodes have initial opinions (or measurements) and a consensus must be reached via local dynamics. Boyd, Ghosh, Prabhakar, and Shah (2006) obtained sharp spectral bounds for edge-averaging. The number of averaging steps to approach consensus could be as large as cn^4 for certain n-node graphs. In joint work with Elboim and Peretz, we obtain similar bounds for node-averaging, and show both processes are much faster (polylogarithmic) when the initial opinions are i.i.d. Recently, with Amir and Nazarov, we showed that Lipschitz learning (where only the highest and lowest adjacent opinions are averaged) achieves an upper bound of order n^3 averaging steps on all n-node graphs for all initial data. The corresponding lower bound requires an inequality that first appeared in the study of the maximum overhang problem: How far can n unit blocks extend out from their base? (Answer: cube root of n)

Biography

Yuval Peres obtained his PhD in 1990 from the Hebrew University, Jerusalem. He was a postdoctoral fellow at Stanford and Yale, and was then a Professor of Mathematics and Statistics in Jerusalem and in Berkeley. Later, he was a Principal researcher at Microsoft. In 2023, he joined Beijing Institute of Mathematical Sciences and Applications. He has published more than 350 papers in most areas of probability theory, including random walks, Brownian motion, percolation, and random graphs. He has co-authored books on Markov chains, probability on graphs, game theory and Brownian motion, which can be found at https://www.yuval-peres-books.com. His presentations are available at https://yuval-peres-presentations.com. He is a recipient of the Rollo Davidson prize and the Loeve prize. He has mentored 21 PhD students including Elchanan Mossel (MIT, AMS fellow), Jian Ding (PKU, ICCM gold medal and Rollo Davidson prize), Balint Virag and Gabor Pete (Rollo Davidson prize). He was an invited speaker at the 2002 International Congress of Mathematicians in Beijing, at the 2008 European congress of Math, and at the 2017 Math Congress of the Americas. In 2016, he was elected to the US National Academy of Science.

**** ALL ARE WELCOME ****

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