On the Complexity of Game, Market, and Network Equilibria

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007 Kemeny Hall, 4:00 pm
(Tea 3:30 pm 300 Kemeny Hall)

Abstract

I will present some recent results in Algorithmic Game Theory and particularly in computing and approximating game, market, and network equilibria. As you may have already known, the notion of the Nash equilibrium has captured the imagination of much of the computer science theory community, both for its many applications in the growing domain of online interactions and for its deep and fundamental mathematical structures. As the scale of typical internet applications increases, the problems of efficiently analyzing their game-theoretic properties become more pointed. I will discuss the recent results in settling several open questions about Nash equilibria. I will focus on the approximation and smoothed complexity of equilibrium computation in noncooperative two-player games. I will also address the extensions of these results to other equilibrium problems such as in trading and market economies and the Internet BGP protocols.

Joint work conducted with Xi Chen (IAS, Princeton), Xiaotie Deng (The City University of Hong Kong); also with Li-Sha Huang (Google China), Paul Valiant (MIT), Kyle Burke (Boston University), Laura J. Poplawski (Northeastern), Rajmohan Rajaraman (Northeastern), and Ravi Sundaram (Northeastern).

This talk should be accessible to graduate students.

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