

CHEN, Ning
Assistant Professor

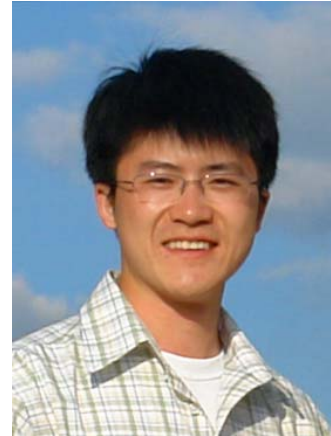
Division of Mathematical Sciences
School of Physical and Mathematical Sciences
Nanyang Technological University

B.S. (Fudan University), Ph.D. (University of Washington)

Major Research Interest: **Algorithmic Game Theory**
Algorithmic and Economic aspects of the Internet
Theoretical Computer Science

Email: ningc@ntu.edu.sg
<http://www.ntu.edu.sg/home/ningc/>

Tel: (65) 6513 2029



The recent surge of activity at the boundary between Game Theory and Theory of Computation has brought a true intellectual renaissance to both fields. Clearly, much of this research is motivated by the emergence of the Internet and its growing impact on every walk of life. Many important artifacts are affected in deep ways by cooperation and competition between parties with different economic interests. Algorithms and protocols, e.g., for routing, resource allocation and electronic commerce, need to be rethought in light of these economic effects. Game theoretic ideas (e.g. Mechanism Design, Auction Theory), which describe and predict behaviors of individuals driven by economic goals, have been widely applied in the design of algorithms and protocols in the Internet.

Mechanism design is a fascinating subfield of Game Theory and Microeconomics, focusing on incentive engineering. A mechanism is an algorithm or protocol that is explicitly designed so that rational participants, motivated solely by their self-interest, will end up achieving the designer's goals.

Auction theory specifies the number of transactions and payments among sellers and buyers who submit bids for some given goods. For different purposes, the designed protocols should satisfy desired properties in the Internet. For example, two important properties are mainly concerned in the auction protocols: optimum and incentive

compatibility. The first one is the basic requirement in economics, whereas the second condition is mostly served for the protocols in the Internet. The design of auction protocols that satisfy required conditions is always a key question in electronic commerce.

Selected Publications

N. Chen, A. Ghosh, and S. Vassilvitskii. Optimal Envy-Free Pricing with Metric Substitutability. In proceedings of the 9th ACM Conference on E-Commerce (EC), 60-69, 2008.

N. Chen. On the Approximability of Influence in Social Networks. In proceedings of the 19th ACM-SIAM Symposium on Discrete Algorithms (SODA), pp1029-1037, 2008.

N. Bansal, N. Chen, N. Cherniavsky, A. Rudra, B. Schieber, and M. Sviridenko. Dynamic Pricing for Impatient Bidders. To appear in ACM Transactions on Algorithms. Preliminary version appeared in proceedings of the 18th ACM-SIAM Symposium on Discrete Algorithms (SODA), pp726-735, 2007.

N. Chen, and A. Karlin. Cheap Labor Can Be Expensive. In proceedings of the 18th ACM-SIAM Symposium on Discrete Algorithms (SODA), pp707-715, 2007.

N. Chen, X. Deng, and X. Sun. On Complexity of Single-Minded Auction. Journal of Computer and System Sciences (JCSS), V.69(4), pp675-687, 2004.