



Cornell University

Information, Systems, and Networks seminar

Pricing of Fluctuations in Electricity Markets

Rhodes Hall 310: April 3, 2013 @ 4:30PM



ISN Seminar Speaker:

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Abstract

In the near future, deep penetration of volatile renewable electricity generation is expected to exacerbate the variability of demand on conventional (thermal) generating units. We address this issue by explicitly modeling the ancillary cost associated with demand variability. We argue that charging consumers time-varying prices equal to the suppliers' instantaneous marginal cost may not achieve social optimality. We propose a dynamic pricing mechanism that explicitly encourages consumers to adapt their consumption so as to offset the variability of demand on conventional units. Through a dynamic game-theoretic formulation, we show (under suitable convexity assumptions) that the proposed pricing mechanism achieves social optimality asymptotically, as the number of consumers grows large.

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Biography

Yunjian Xu recently completed his PhD degree at MIT under the supervision of John Tsitsiklis. He is currently a postdoctoral scholar in the Center for the Mathematics of Information at California Institute of Technology. His research has focused on modeling and analyzing agents' strategic behavior in a variety of market models (e.g., electricity markets, cloud markets, and auctions). He is a recipient of the MIT-Shell Energy fellowship.