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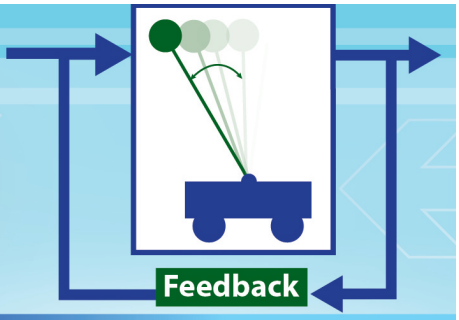
Control Seminar



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Value of Information in Bayesian Congestion Games

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Department of Civil and Environmental Engineering

Friday, October 7, 2016

3:30 – 4:30 pm • 1500 EECS

ABSTRACT: In recent years, commuters are increasingly relying on traffic navigation applications (e.g., Waze, Google maps) to decide their routes and departure times. This talk focuses on the question of estimating the social value of such navigation systems. We present a game theoretic framework to model routing strategies in environments where the route costs are affected by a random network state, and commuters have heterogeneous access to information regarding the state. The framework enables modeling of commuters' private beliefs of the network state and of the other commuters. We conduct equilibrium analysis of Bayesian congestion games under a range of information structures introduced by navigation applications. Our results suggest that access to information reduces costs to individual informed commuters, but the relative value of information can be zero (or even negative) if many commuters are highly informed. Moreover, there exists a fraction of informed commuters above which the aggregate social cost may increase.

BIO: Saurabh Amin is Robert N. Noyce Career Development Assistant Professor in the Department of Civil and Environmental Engineering, Massachusetts Institute of Technology (MIT). His research focuses on the design and implementation of high confidence network control algorithms for infrastructure systems. He works on robust diagnostics and control problems that involve using networked systems to facilitate the monitoring and control of large-scale critical infrastructures, including transportation, water, and energy distribution systems. He also studies the effect of security attacks and random faults on the survivability of networked systems, and designs incentive-compatible control mechanisms to reduce network risks. Dr. Amin received his Ph.D. in Systems Engineering from the University of California, Berkeley in 2011. His research is supported by NSF CPS FORCES project, NSF CAREER award, Google Faculty Research award, and Siebel Energy Institute Grant.

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