

Optimizing Cyber-Physical Systems



Tara Javidi

Associate Professor, Electrical and Computer Engineering

CURRENT RESEARCH

Improving big data acquisition and analysis in smart energy grids and data centers

Dr. Javidi understands the importance of data, especially its time sensitivity. A delay in data transmission in a large cyber-physical system, such as a data center or smart energy grid, can result in the loss of millions for companies and the missed opportunity to discover vital knowledge via real-time data analytics.

A cyber-physical system includes computing technologies that are responsible for the collection, processing, and acquisition of information, which is synthesized with a physical system. Thus in the case of a smart energy grid, the "cyber" elements include the computing technologies which measure energy usage, and the "physical" system is the energy grid itself which controls the output of energy, based on commands from the "cyber" system. Given that large cyber-physical systems have so many sensors, collecting all possible data typically results in a glut of information. This may be inefficient and overwhelming in terms of processing, and it also makes the data collection excessively expensive and resource-intensive.

- Dr. Javidi is developing a new theoretical framework for understanding how to best control information flow in large cyber-physical systems such as data centers or smart energy grids.
- Dr. Javidi is conducting experiments on large electricity grids to predict failures (small or cascading) or even typical aspects of the network operation such as what time of day is best for doing certain energy-rich tasks.
- In particular, she is investigating which pieces of data gathered by cyber-physical systems are the most informative, but also which pieces of information can add reliability to...

AFFILIATION

-  University of California, San Diego

EDUCATION

- Ph.D. in Electrical Engineering and Computer Science: Systems 2002, University of Michigan
- M.S. in Applied Mathematics 1999, University of Michigan
- M.S. in Electrical Engineering and Computer Science: Systems 1998, University of Michigan

AWARDS

- NSF CAREER Award, 2004

RESEARCH AREAS

Clean Energy, Technology, IOT, Devices, Data, Informational Sciences / Internet

FUNDING REQUEST

Your contributions will help Dr. Javidi better understand how people acquire and use information in cyber-physical systems. Dr. Javidi enjoys the theoretical component of her research, yet she continues to uncover new methods for improving information sharing. Help her continue to find new ways for revolutionize information sharing and acquirement!

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