FORCES
FOUNDATIONS OF RESILIENT CYBER-PHYSICAL SYSTEMS

TIME	*TOPIC*

Thursday, June 9, 2016

0800 – 0900   Registration/Check-In and BREAKFAST (Salon M, 7th Floor)

Session I: Project and Scientific Overview (Room 164, 1st Floor)

0900 – 0915   Welcome and Opening Remarks
David Corman (National Science Foundation)

0915 – 0945   FORCES Program Highlights
Larry Rohrbough (Berkeley)

0945 – 1015   Beyond FORCES: The Sharing Economy and Emerging Data Market
Lillian Ratliff (Berkeley); Shankar Sastry (Berkeley)

1015 – 1030   BREAK

1030 – 1130   Keynote Presentation: "Toward a Unified Approach to Sustainable and Resilient Electric Energy Systems–Modeling, Control and Testbeds"
Professor Marija Ilic (Carnegie Mellon University)

Session II : Sensing Techniques for Improving Resilience

1130 – 1200   Scheduling Resource-Bounded Monitoring Devices
Aron Laszka (Berkeley)

1200 – 1230   Optimization of Intrusion Detection Systems for CPS
Xenofon Koutsoukos (Vanderbilt)

1230 – 1345   LUNCH (Room 5, 6th Floor)
Professor Munther Dahleh, MIT

Session III: Young Researcher Perspectives

1345 – 1545   Young Researcher Talks

1545 - 1600   BREAK

Session IV

1600 - 1630   Education and Outreach
Kena Hazelwood-Carter (Berkeley); Galina Schwartz (Berkeley)

1630 – 1700   A Dynamic Industrial Equilibrium Model for Transition to Cleaner Technologies
Asu Ozdaglar (MIT)

1800   NETWORKING RECEPTION & DINNER
Catalyst Restaurant (300 Technology Square, Cambridge, MA 02139)

TIME	*TOPIC*

Friday, June 10, 2016

0730 – 0830   **BREAKFAST (Salon M, 7th Floor)**

Session V: Model-Based Methods for CPS (Room 164, 1st Floor)

0830 – 0900   Distributed Learning Dynamics Convergence in Routing Games
Alex Bayen (Berkeley)

0900 - 0930   Experimental Evaluation Platform for Resilience in CPS
Gabor Karsai (Vanderbilt)

0930 - 1000   Tools for System – Security Co-Design
Janos Sztipanovits (Vanderbilt)

1000 – 1015   **BREAK**

Session VI: Foundations of EI+RC in Emerging Societal-Scale CPS

1015 – 1045   Managing Risks in Large-Scale Interdependent CPS
Galina Schwartz (Berkeley)

1045 – 1115   Resilience of Networked Cyber-Physical Systems
Hamsa Balakrishnan (MIT)

1115 – 1145   Building Cyber-enabled Resilience in Infrastructure Networks
Saurabh Amin (MIT)

1145 – 1200   **Concluding Remarks**

1200   **Meeting End. Box lunches available.**

Young Researchers Presentations

Thursday, June 9, 2016

1345 - 1355	Resilient Fault Localization in Water Networks Using Multi-level Sensing *Waseem Abbas (Vanderbilt)*
1355 - 1405	Machine Learning for Causal Inference on High-frequency Observational Data: The Case of Residential Demand Response *Max Balandat (Berkeley)*
1405 - 1415	Understanding the Impact of Parking on Urban Mobility via Routing Games on Queue–Flow Networks *Dan Calderone (Berkeley)*
1415 – 1425	Modeling Fuel Flow Rate using Gaussian Processes *Yashovardhan Chati (MIT)*
1425 – 1435	Air Traffic Delay Models *Karthik Gopalakrishnan (MIT)*
1435 – 1445	Vulnerability of Fixed-Time Control of Signalized Intersections to Cyber-Tampering *Amin Ghafouri (Vanderbilt)*
1445 – 1455	Stability and Control of Piecewise-Deterministic Queueing Systems *Li Jin (MIT)*
1455 – 1505	Continuous-time Learning and Optimization *Walid Krichene (Berkeley)*
1505 – 1515	Solving Large-Scale Multiperiod OPF Problems Using an AC-QP Algorithm *Jennifer Marley (Michigan)*
1515 – 1525	Energy and Capacity Markets for Stable Renewable Economy *Mohammad Rasouli (Michigan)*
1525 - 1545	Sequential Market Mechanisms for Wind Energy *Hamid Tavafoghi (Michigan)*

FORCES All Hands Meeting June 9-10, 2016 | **Guest Speaker Bios**

Marija D. Ilić, D.Sc.
Professor of Electrical & Computer Engineering, Carnegie Mellon University
Affiliate Professor of Engineering & Public Policy, Carnegie Mellon University
Director, Electric Energy Systems Group (EESG)

Marija D. Ilić is currently a Professor at Carnegie Mellon University, Pittsburgh, PA, with a joint appointment in the Electrical and Computer Engineering and Engineering and Public Policy Departments. She is also the Honorary Chaired Professor for Control of Future Electricity Network Operations at Delft University of Technology in Delft, The Netherlands. She was an Assistant Professor at Cornell University, Ithaca, NY, and tenured Associate Professor at the University of Illinois at Urbana-Champaign. She was then a Senior Research Scientist in Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, from 1987 to 2002. She has 30 years of experience in teaching and research in the area of electrical power system modeling and control. Most recently she became the Director of the Electric Energy Systems Group at Carnegie Mellon University whose main objective is mathematical modeling, analysis and decision making for the future energy systems. She is leading the quest for transforming today's electric power grid into an enabler of efficient, reliable, secure and sustainable integration of many novel energy resources. She has co-authored several books in her field of interest. Prof. Ilić is an IEEE Fellow and Distinguished Lecturer.

Her principal fields of interest include electric power systems modeling; design of monitoring, control, and pricing algorithms for electric power systems; normal and emergency control of electric power systems; control of large scale dynamic systems; nonlinear network and systems theory; modeling and control of economic and technical interactions in dynamical systems with applications to competitive energy systems.

Munther A. Dahleh
Professor, MIT
Director of IDSS

Munther A. Dahleh is the William A. Coolidge Professor in the Department of Electrical Engineering and Computer Science at MIT. Professor Dahleh joined the Laboratory for Information and Decision Systems (LIDS) as an assistant professor of EECS in 1987 and became a full professor in 1998. He spent the spring of 1993 as a visiting professor in the Department of Electrical Engineering, California Institute of Technology and has held consulting positions with several companies in the U.S. and abroad.

Dr. Dahleh is interested in problems at the interface of robust control, filtering, information theory, and computation, which include control problems with communication constraints and distributed mobile agents with local decision capabilities. His interests include problems in network science, such as distributed computation over noisy networks and information propagation over complex social networks. He also studies model reduction problems for discrete-alphabet hidden Markov models and universal learning approaches for systems with both continuous and discrete alphabets. His research includes the interface between systems theory and neurobiology, and in particular, providing an anatomically consistent model of the motor control system.