Workshop for Middle and High School Students and Teachers

Wednesday, July 1, 2015
9:30 am – 2:30 pm
Red Lacquer Room, Hilton Palmer House*

The Power, Beauty and Excitement of Cross-Boundaries Nature of Control, a Field that Spans Science, Technology, Engineering & Mathematics (STEM)
15th Anniversary

This workshop is held in conjunction with the 2015 American Control Conference.

Organizing and Program Committee:
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Sponsors:
American Automatic Control (AACC) Technical Committee on Education
IEEE Control Systems Society (CSS) Technical Committee on Control Education

This outreach event is designed to increase the general awareness of the importance of systems and control technology and its cross-disciplinary nature among high school students and teachers. Control is used in many common devices and systems: cell phones, computer hard drives, automobiles, and aircraft. The control field spans science, technology, engineering and mathematics (STEM). The success of all STEM disciplines depends on attracting the most gifted young people to science and engineering professions.

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PROGRAM

9:30 **Welcome**
Bozenna Pasik-Duncan, University of Kansas and Chair AACC Committee on Education
Richard Braatz, Massachusetts Institute of Technology and General Chair, 2015 American Control Conference
Radhakishan Baheti, Program Director, National Science Foundation

10:00 *The Miracle of Stabilization*
Dennis Bernstein, Professor of Aerospace Engineering, University of Michigan

10:20 *How to Design a Self-Driving Car*
Richard Murray, Everhart Professor of Control and Dynamical Systems and Bioengineering, California Institute of Technology

10:40 *Molecular Robots*
Elisa Franco, Assistant Professor of Mechanical Engineering, University of California, Riverside

11:00 *Micro-Hybrid Breathing Engines*
Anna Stefanopoulou, Professor of Mechanical Engineering and Naval Architecture and Marine Engineering, University of Michigan

11:20 *From Wright Brothers First Flight to Curiosity's Landing on Mars: What Makes Flight Control Challenging and How to Provide Guarantees of Performance*
Naira Hovakimyan, Professor, University Scholar and Schaller Faculty Scholar of Mechanical Science and Engineering, University of Illinois, Urbana-Champaign

11:40 *Computational Thinking as the Link Between Recent Curriculum and Applied Mathematics*
Andrew Bucki, Associate Professor of Mathematics, Langston University and Faculty Member, Oklahoma School of Science and Mathematics

12:00 **Lunch** (provided on site) **/ Tour conference exhibits / Meet control researchers**

12:50 *Control of Complex Networks*
Andrew Clark, Assistant Professor of Electrical and Computer Engineering, Worcester Polytechnic Institute

1:10 *Think Mathematically Act Computationally*
Alec Knutsen, B.S. Student in Math and Computer Science, University of Kansas

1:30 *Medically Inspired Engineering: Building an Artificial Pancreas*
Francis J. Doyle III, Dean, Paulson School of Engineering and Applied Sciences, Harvard University (Beginning August 1)
Mellichamp Endowed Chair Professor in Process Control at UCSB

1:50 *Communicating Through Motion in Dance*
John Baillieul, Distinguished Professor of Mechanical Engineering, Boston University and **Kayan Ozcimder**, Postdoctoral Research Associate, Princeton University

2:10 **Student Reflections of the Workshop / Closing Discussion and Remarks**
Bozenna Pasik-Duncan *and* **Linda Bushnell**

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