Special Sessions/Events

Workshop for High School Students and Teachers

Title: "The Ideas and Technology of Control Systems"

The Power and Beauty of a Field that Spans Science, Technology, Engineering and Mathematics (STEM)

Organizer and Chair: Bozenna Pasik-Duncan, University of Kansas and Chair of CSS and AACC Technical Committees on Control Education

Sponsored by: CSS, AACC and University of Kansas

Time: Monday, December 12, 9:30 am - 3:00 pm**.**

Location: Floridian Ballroom, Salon C

The purpose of this event is to increase the general awareness of the importance of systems and control technology and its cross-disciplinary nature among high school teachers and students. Workshop activities include presentations by control scholars, informal discussions, and provide an opportunity for high school students and their teachers to meet passionate researchers and educators from academia and industry. The talks are designed to be educational, inspirational, and entertaining showing the excitement of being a control engineer. This event follows a series of similar successful events and celebrates the 10th Anniversary of the Control Systems Society and American Automatic Control Council Outreach Program.

New Horizons for Control Technology at Honeywell

Time: Monday December 12, 12:15 pm – 1:15 pm.

Location: Jackson

You know Honeywell for its leadership in areas such as process optimization and control, flight management and avionics, and home and building control systems. But the horizons for us—and for the controls community broadly—are expanding!

We invite you to this session to hear about some of our new and exciting developments in optimization, control, and related subjects. We will discuss technical details as well as provide perspectives on the energy and environmental problems that we are addressing with control technology worldwide. Applications to be discussed include: automotive engines, electricity microgrids, smart homes, and water distribution networks.

Session participants include:

- Datta Godbole, Chief Technology Officer, Honeywell Building Solutions (US)
- Purnaprajna Mangsuli, Principal Research Scientist, Honeywell Technology Solutions (India)
- Tariq Samad, Corporate Fellow, Honeywell Automation and Control Solutions (US)
- Greg Stewart, Fellow, Honeywell Process Solutions (Canada)

Lunch will be provided—but quantities are limited so arrive early!

Women in Control Luncheon

Semi-annual meeting of the IEEE CSS Standing Committee on "Women in Control"
Time: Tuesday, December 13, 12:00 pm - 1:30 pm
Location: Citrus/Collier

All women attending the conference are kindly invited.

MathWorks Lunchtime Technical Session

Time: Tuesday, December 13, 12:00 pm - 2:00 pm
Location: Jackson

Part 1: Control System Auto-Tuning in Simulink (Pascal Gahinet, Ph.D. | MathWorks)

In this first half of our lunch session, you will learn about new MathWorks tools and algorithms for tuning control systems modeled in Simulink. These tools let engineers specify high-level performance requirements such as bandwidth, stability margins, and tracking performance, and automatically tune the control system parameters for the specified control architecture. This takes the guesswork and tediousness out of tuning and leaves more time to explore high-level design options and trade-offs. This talk will showcase applications to interactive tuning of PID loops, fast tuning of decentralized multi-loop architectures, and performance optimization in both time and frequency domains.

Part 2: Case Study: How Differential Equations Become a Robot (Carlos Osorio | MathWorks)

This second half of our lunch session will show the iterative process of analysis, design and optimization involved in the development and implementation of a real-world practical application. The demonstration example will examine how a simple second order differential equation can evolve into a complex dynamic model of a multi-degree of freedom robotic manipulator that includes the controls, electronics and three-dimensional mechanics of the complete system.

About the Presenters

Pascal Gahinet is lead scientist for the Control and Identification product family at MathWorks. His recent contributions include a novel PID tuning algorithm (pidtune) and ground-breaking software for structured H-infinity synthesis (hinfstruct). He joined MathWorks in 1996 as lead developer for Control System Toolbox. For six years before that, he was a research fellow at INRIA, France, with interests in numerical software, robust control theory, and LMI-based design. He was one of the co-authors of the LMI Control Toolbox. Pascal graduated from École Polytechnique in Paris and has a Ph.D. in electrical engineering from the University of California, Santa Barbara.

Carlos Osoriois an application engineer specializing in control systems for robotics and vehicle dynamics. Before joining The MathWorks in 2007, he worked in the Advanced Chassis Technology Department at Visteon Corporation, where he was involved in the development and implementation of prototype electronic active suspension, steer-by-wire, and brake-by-wire systems for passenger vehicles. Carlos received a B.S. from the Pontificia Universidad Catolica del Peru and an M.S. from the University of California at Berkeley, both in mechanical engineering.