

***The Power, Beauty and Excitement of a Field that Spans Science, Technology, Engineering and Mathematics*** workshop was held at the 2009 American Control Conference in St. Louis, MO, June 9, 2009. The workshop gave high school teachers the opportunity to meet passionate researchers and educators from academia and industry and National Science Foundation GK-12 fellows from Washington University, St. Louis, and Kansas University, Lawrence. The workshop increases the general awareness of the importance of systems and control technology and its cross-disciplinary nature among high school teachers and students. The workshop activities included presentations by control scholars and graduate students and informal discussions. The talks were designed to be educational, inspirational and entertaining showing the excitement of being an engineer.

This year's program included presentations on robots, mathematical models for medical treatments, and careers in mechatronics. **Jessy Grizzle**, Levin professor of engineering, University of Michigan, Ann Arbor, discussed his research to give robots the same sense of balance as humans. His videos featured MABEL, a bipedal robot designed to run. **Mark Spong**, Dean of the School of Engineering and Computer Science and Chair of Electrical Engineering at the University of Texas at Dallas, talked about the emerging area of mechatronics and its application to robotics and control. Mechatronics deals with the integration of mechanical systems, electronics, computer science and control. Automobiles, airplanes, robots, and medical devices are examples of mechatronic systems.

Models describing the dynamics of cancer growth under various treatments and how control systems can help doctors and scientists find the optimal drug protocol was presented by **Urszula Ledzewicz**, professor of mathematics and statistics, Southern Illinois University, Edwardsville. The relationship between seizures in animals and earthquakes was shown by **Dr. Ivan Osorio**, professor of neurology, University of Kansas Medical Center, Kansas City, KS. **Dominique Duncan's**, graduate student in engineering, Yale University, New Haven, CT, presentation focused on using diffusion geometry for the detection and prediction of seizures.

STEM (Science, Technology, Engineering and Mathematics) Fellows from the Mechanical, Aerospace and Structural Engineering and Electrical and Systems Engineering Departments at Washington University, **C.J. DeGroot**, **Jeffrey Mitchell**, **Jose Lopez** and **Kevin Derendorf**, discussed their experiences of working with middle and high school students in St. Louis. They taught students about the math and physics involved in the analysis of a truss bridge, the basics of earthquake engineering, using LEGO® robots to promote STEM careers, and the challenges they faced to excite students about the sciences.

A panel discussion on how to engage teachers and K-12 students in control engineering education, what role engineering plays in STEM education, and how to attract more students concluded the workshop.

**Sponsored by:** IEEE CSS and AACC Technical Committees on Control Education, and University of Kansas.

**Organizers:** Bozenna Pasik-Duncan, professor of mathematics and courtesy professor of electrical engineering and computer science, University of Kansas, and Shirley Dyke, Dicke professor of engineering, Washington University.

**Assisted by:** Dominique Duncan, Yale University.

This popular and inspirational workshop organized at every ACC and CDC since 2000, designed for middle and high school teachers and students brought for the first time faculty, graduate students and teachers together. The workshop was a successful and memorable event.

The organizers of the workshop wish to thank CSS and AACC as well as the organizers of 2009 ACC for their enthusiastic encouragement and support.

Prepared by Bozenna Pasik-Duncan, Chair, CSS and AACC Technical Committees on Control Education