UCSD Jacobs | Mechanical and Aerospace Engineering

The Department of Mechanical & Aerospace Engineering
Stanford S. and Beverly P. Penner
Distinguished Lectures

Architectures for control using highly distributed, slow computing

Richard M. Murray
Control & Dynamical Systems and Bioengineering
California Institute of Technology

Monday, February 4, 2013
4:00 p.m.-5:00 p.m.
CMRR Auditorium, UCSD

ABSTRACT
Current techniques for the design of software-enabled control systems rely on the existence of high performance sensing, actuation and computational devices that can be embedded within a physical system at modest cost. In this talk, I will discuss control approaches that lie at the other end of the computational spectrum: we seek to develop new principles and tools for the design of closed loop control systems using highly distributed, but slow, computational elements. Long term application areas for such approaches include the design of control systems using novel computing substrates, such as extremely low power computational units or biological circuits encoded in engineered DNA. Our initial results include bootstrapable methods for vision-based navigation using bilinear computations and delay-based control system design.

BIO
Richard M. Murray received the B.S. degree in Electrical Engineering from California Institute of Technology in 1985 and the M.S. and Ph.D. degrees in Electrical Engineering and Computer Sciences from the University of California, Berkeley, in 1988 and 1991, respectively. He joined the faculty at Caltech in 1991 in Mechanical Engineering and helped found the Control and Dynamical Systems program in 1993. In 1998-99, Professor Murray took a sabbatical leave and served as the Director of Mechatronic Systems at the United Technologies Research Center in Hartford, CT. Upon returning to Caltech, Murray served as the Division Chair (dean) of Engineering and Applied Science at Caltech from 2000-2005, the Director for Information Science and Technology (IST) from 2006-2009, and interim Division Chair from 2008-2009. He is currently the Thomas E. and Doris Everhart Professor of Control & Dynamical Systems and Bioengineering at Caltech. Murray's research is in the application of feedback and control to networked systems, with applications in biology and autonomy. Current projects include analysis and design biomolecular feedback circuits; specification, design and synthesis of networked control systems; and novel architectures for control using slow computing.

Reception to Follow

The Professional Community is Cordially Invited

Information: +1(858) 534-0113