

# SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

## LECTURE 2

### Bioplausible Approaches to Control using Highly Distributed, Slow Computing

*Richard Murray*

*Thomas E. and Doris Everhart Professor*

*Control & Dynamical Systems and Bioengineering at Caltech*

**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.

Tuesday April 10, 2012

10:00 - 11:30 a.m.

Green Hall, room 0120

Host: Hiro Mukai

**Short 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 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 specification, design and verification of networked control systems, novel control architectures using "slow computing", and biological circuit design.

The Annual Zaborszky Lecture Series was created in 1990 to honor the founder and first chairman of the Department of Systems Science and Mathematics, Professor John Zaborszky. Each year a distinguished scholar is invited to present a series of three lectures in his/her field of expertise.