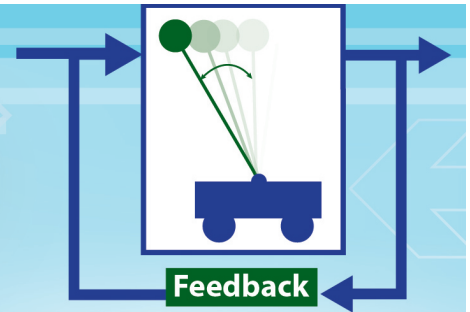


COLLEGE OF ENGINEERING

Control Seminar



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Abstraction and control of stochastic systems: application to miniature multi-legged robots



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Department of Mechanical Engineering

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3:30 – 4:30 pm • 1500 EECS

ABSTRACT: This talk will explore the kinematics of multi-legged robots at a miniature scale, and present methodologies for deriving low-dimensional abstractions that not only capture the behavior of the system on average, but also reproduce the variability observed in experimental data. While the deterministic versions of these abstract models are used to derive motion plans, their stochastic analogs, when appropriately parameterized, can predict to a certain extent the propagation of probability density in the physical process that governs the robot's quasi-static motion. The talk will offer evidence that formal behavior-inclusion relationships can be established between the stochastic abstractions and the physical processes that generate the data that determine the abstraction parameters.

BIO: Herbert (Bert) Tanner received his PhD in mechanical engineering from the National Technical University of Athens in 2001. After a post doc at the Department of Electrical and Systems Engineering of the University of Pennsylvania from 2001 till 2003, he joined the Department of Mechanical Engineering at the University of New Mexico, where he was an assistant professor until 2008. In 2008, he joined the Mechanical Engineering Department at the University of Delaware, where he is currently an associate professor. Since 2012 he is also serving as the director of UD's graduate certificate program in cognitive science. Tanner received an NSF Career award in 2005. He is a member of ASME and a senior member of IEEE. He has served in the editorial boards of the IEEE Robotics and Automation Magazine, and the IEEE Transactions of Automation Science and Engineering, as well as the conference editorial boards of IEEE's Control Systems and Robotics & Automation Societies for a number of years. He is currently an associate editor for IEEE Transactions on Automatic Control, and Nonlinear Analysis: Hybrid Systems.