SYSTEMS, CONTROLS AND ROBOTICS SEMINAR

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4:00 p.m. / 303 DPC Annex Building (CSA)

Stochastic Control and Trajectory Optimization: Information Theoretic Interpretations and Algorithms

ABSTRACT

While the topic of nonlinear stochastic control has been traditionally studied within control theory and applied mathematics, over the past 10-15 years there has been an increasing interest by researchers in the machine learning, statistical physics and robotics communities to expand nonlinear stochastic optimal control in terms of theoretical generalizations and algorithms. The main motivation for this increasing interest is the ability to solve stochastic optimal control problems with forward sampling of Stochastic Differential Equations(SDEs). There has been few approaches in the literature on this topic under the names of path integral control, Kullback-Leibler control or linearly solvable optimal control.

In this talk, in the first half I will present a unified view of the aforementioned approaches on stochastic control theory and show applications to autonomous systems and robotics. On the second half, I will present ongoing research on generalizations of stochastic control and show new algorithms for trajectory optimization based on non-parametric regression methods.

BIO

Evangelos Theodorou is Assistant Professor, at the Daniel Guggenheim School of Aerospace Engineering at Georgia Tech. He is also affiliated with the Institute of Robotics and Intelligent Machines (IRIM) and the Decision Control Lab (DCL) at Georgia Tech. Prior to Georgia Tech, he was Postdoctoral Research Fellow with the Department of Computer Science and Engineering at University of Washington. Evangelos Theodorou has a PhD in Computer Science and MS in Electrical Engineering from University of Southern California. He has also, a MS in Computer Science and Engineering from University of Minnesota and a MS in Production Engineering and a Diploma in Electrical Engineering from Technical University of Crete. His research interests spans the areas of stochastic optimal control and reinforcement learning with applications to autonomous systems, robotics and computational neuroscience.

Pizza will be served at 3:45 p.m.