IRIM Seminar Series

Georgia Tech
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Control Principles for Robot Learning

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February 7, 2024 | 12:15 p.m - 1:15 p.m. | Marcus Nanotech 1116

Abstract: Embodied learning systems rely on motion synthesis to enable efficient and flexible learning during continuous online deployment. Motion motivated by learning needs can be found throughout natural systems, yet there is surprisingly little known about synthesizing motion to support learning for robotic systems. Learning goals create a distinct set of control-oriented challenges, including how to choose measures as objectives, synthesize real-time control based on these objectives, impose physics-oriented constraints on learning, and produce analyses that guarantee performance and safety with limited knowledge. In this talk, I will discuss learning tasks that robots encounter, measures for information content of observations, and algorithms for generating action plans. Examples from biology and robotics will be used throughout the talk and I will conclude with future challenges.

Bio:Todd Murphey is a Professor of Mechanical Engineering in the McCormick School of Engineering and of Physical Therapy and Human Movement Sciences in the Feinberg School of Medicine, both at Northwestern University. He received his Ph.D. in Control and Dynamical Systems from the California Institute of Technology. His laboratory is part of the Center for Robotics and Biosystems, and his research interests include robotics, control, human-machine interaction, and emergent behavior in dynamical systems. He received the National Science Foundation CAREER award, was a member of the 2014-2015 DARPA/IDA Defense Science Study Group, and is a current member of the United States Department of the Air Force Scientific Advisory Board.

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