Safe Learning in Control

Friday, April 5th, 2024
12:30 PM
Bowen Hall Room 222

MAE Baetjer Colloquium

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In many applications of autonomy in robotics, guarantees that constraints are satisfied throughout the learning process are paramount. We present a controller synthesis technique based on the computation of reachable sets, using optimal control and game theory. Then, we present methods for combining reachability with learning-based methods, to enable performance improvement while maintaining safety, and to move towards safe robot control with learned models of the dynamics and the environment. We will discuss different interaction models with other agents, and some implications of model vs. learning-based predictions.

Claire Tomlin is the James and Katherine Lau Professor and Chair of the Department of Electrical Engineering and Computer Sciences at UC Berkeley. She was an Assistant, Associate, and Full Professor at Stanford from 1998-2007, and in 2005 she joined Berkeley. Claire works in hybrid systems and control and integrates machine learning methods with control theoretic methods in the field of safe learning. She works in the applications of air traffic and unmanned air vehicle systems. She is a MacArthur Fellow, and a member of the National Academy of Engineering and the American Academy of Arts and Sciences.

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