

Deep Reinforcement Learning

Guest Seminar

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Abstract

This short seminar gives an overview on deep reinforcement learning techniques and their application in control systems.

Reinforcement learning is getting a lot of attention lately. People are excited about its potential to solve complex problems in areas such as robotics and automated driving, where traditional control methods can be challenging to use. In addition to deep neural nets to represent the policy, and algorithms to train them, reinforcement learning requires repeated exploration of the environment. As such exploration is time-consuming and potentially dangerous when done with the hardware, a simulation model is often used to represent the environment, at least for the initial training. In this talk, we will discuss reinforcement learning and contrast it with traditional control methods. We will go through the steps needed to set up and solve a reinforcement learning problem. We will then talk about relevant MathWorks capabilities and resources and will show an example of developing a walking robot controller using reinforcement learning.

Short Biography

Craig Buhr is the development manager for the Control Design group, whose focus is developing tools for the design and analysis of control systems and reinforcement learning. He joined MathWorks in 2003 as a Senior Developer for the Controls and Identification products. He received his Ph.D. in Mechanical Engineering from Purdue University.