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Deep Visuomotor Learning

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Abstract

Deep learning has enabled a wide range of successes in a number of computer vision tasks, such as object detection, face recognition, and image processing. However, these successes have relied on large supervised datasets. If we want to move towards autonomous robotic systems that can autonomously learn a wide range of vision-based motor skills, it becomes impractical to collect such large human-labeled datasets.

In this lecture, I will discuss approaches for autonomously learning visuomotor skills, overviewing topics ranging from deep reinforcement learning, learning visual state representations for planning and control, and self-supervised methods for skill learning. In particular, I will detail some of the most successful methods for learning vision-based skills on real robot platforms, discuss some of the challenges in applying reinforcement learning to real-world problems, and present the open problems in deep visuomotor learning.