

CENTER FOR CONTROL, DYNAMICAL – SYSTEMS & COMPUTATION  
UNIVERSITY OF CALIFORNIA, SANTA BARBARA PRESENTS

# Pieter Abbeel

APRIL 26 3.00-4.00PM WEBB 1100

## DEEP LEARNING TO LEARN

Reinforcement learning and imitation learning have seen success in many domains, including autonomous helicopter flight, Atari, simulated locomotion, Go, robotic manipulation. However, the amount of data required for these methods remains very high. In contrast, humans can pick up new skills far more quickly. To do so, humans might rely on a better learning algorithm or on a better prior (potentially learned from past experience), and likely on both. In this talk I will describe some recent work on meta-learning for action, where agents learn the imitation/reinforcement learning algorithms and learn the prior. This has enabled acquiring new skills from just a single demonstration or just a few trials. While originally designed for imitation and RL, our work is more generally applicable and also advanced the state of the art in image recognition from a small number of examples.

*Pieter Abbeel is Professor and Director of the Robot Learning Lab at UC Berkeley [2008- ], Co-Founder of covariant.ai [2017- ], Co-Founder of Gradescope [2014- ], Advisor to OpenAI, Founding Faculty Partner AI@TheHouse, Advisor to many AI/Robotics start-ups. He works in machine learning and robotics. In particular his research focuses on making robots learn from people (apprenticeship learning), how to make robots learn through their own trial and error (reinforcement learning), and how to speed up skill acquisition through learning-to-learn (meta-learning). His robots have learned advanced helicopter aerobatics, knot-tying, basic assembly, organizing laundry, locomotion, and vision-based robotic manipulation. He has won numerous awards, including best paper awards at ICML, NIPS and ICRA, early career awards from NSF, Darpa, ONR, AFOSR, Sloan, TR35, IEEE, and the Presidential Early Career Award for Scientists and Engineers (PECASE). Pieter's work is frequently featured in the popular press, including New York Times, BBC, Bloomberg, Wall Street Journal, Wired, Forbes, Tech Review, NPR, Rolling Stone. ([www.cs.berkeley.edu/~pabbeel](http://www.cs.berkeley.edu/~pabbeel))*

