UVA | SCHOOL of DATA SCIENCE

Extensions to Q-Learning

Reinforcement Learning

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Agenda

> Double Q-Learning

> Prioritized Experience Replay

> Dueling Deep Q-Network

Double Q-Learning

Main Idea

DQN requires target estimates of this form:

$$Y_t^{\mathrm{Q}} \equiv R_{t+1} + \gamma \max_a Q(S_{t+1}, a; \boldsymbol{\theta}_t)$$

The max() operation is used to estimate value
There may be noise in the system
Tends to produce a bias: overestimating value of Q

Paper: Deep Reinforcement Learning with Double Q-learning
Hado van Hasselt, Arthur Guez, David Silver. Google DeepMind