Draft Reinforcement Learning Short-Course Syllabus

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Quansight
YOUR DATA EXPERTS

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Overview

We propose a short course that could be given to data scientists and other practitioners covering the practical considerations needed to effectively apply reinforcement learning to real-world problems. The course will use a testing environment (Robot Ant) that simplifies some aspects of implementation but addresses real Physics-based learning tasks.

Topics

- Reinforcement Learning concepts and limitations
- Reward function design and shaping
- Hyperparameter tuning
- Application of a trained model

The course would be given in 6, 1.5-2 hour sessions over a number of weeks (probably 3 weeks).

Schedule and Topics

Day 1: Introduction to reinforcement learning, the PyBullet3 Ant RL environment, OpenAi Gym.

- Homework: read original TD3 paper (https://arxiv.org/abs/1802.09477)

Day 2: Brief overview of widely used RL algorithms and TD3 specifically; walk through set up.

- Homework: clone /Quansight/Practical-RL, set up and run default ant training

Day 3: Extending and experimenting with RL and PyBullet3 to modify the environment.

- Homework: Define a new goal for the ant and put it into practice

Day 4: Key concepts of reward shaping and hyperparameter tuning.

- Homework: Improve the ant goal to increase generalization

Day 5: Testing the trained model in new scenarios different from training.

- Homework: Prepare for show and tell

Day 6: Show and Tell - everyone shows what their ants can do and we discuss.