

Tutorial Deep Reinforcement Learning

Exercise

In this exercise you should use DRL to train a Half Cheetah to run as fast as possible.

Preparation

1. Open a terminal (Icon or Ctrl-Alt-t)
2. Clone the tutorial files from GitHub:
`git clone https://github.com/klausdorer/2024DRL-Tutorial.git`
3. Change to cloned folder: `cd 2024DRL-Tutorial`
4. Run "conda activate" to enter the Conda base environment.
5. Run "jupyter-lab". A browser window should open.
6. Open the Jupyter Notebook "halfcheetah.ipynb" in the file explorer on the left side of the browser window.
7. Confirm the Kernel: Python 3 (ipykernel)

The notebook contains more instructions for this exercise.

Task

Train the cheetah to run as fast as possible to the right. To do this, you have to create a reward function that supports this. During training it might be advisable to start with a not too big number of learning steps (say 300.000) and then create a gif that shows the result of the training. This will give an indication if you ended up in a local optimum. If not, you can simply run more steps on the same model to continue the learning process.

Optional

If time allows or if there are more computers available, you can also try to teach the cheetah to jump (second part of the jupyter notebook).

Literature

<https://stable-baselines3.readthedocs.io/en/master/>

<https://stable-baselines3.readthedocs.io/en/master/common/logger.html>

<https://www.gymnasium.dev/environments/mujoco/>