

Deep Learning for Modeling: Concepts, Tools, and Techniques

ASSIGNMENTS PART TWO

This part of the assignment contains two competitions. The first competition is about generative models. A provided template “generative.py” should be finished to work with the provided automatic checker script “scoreChecker4.py”. The second competition is about reinforcement learning tasks. You should also complete the provided template “reinforcement.py” to work with the provided automatic checker script “scoreChecker5.py”.

1. **Competition Two:** Please implement a Pytorch generative model for a random 2D XY model. The XY model features variables on the closed range of $[-\pi, \pi]$. A dataset named “xyData.bz2” is provided. You should implement your model based on the template “generative.py” provided. Your implemented model and saving file “generative.pth” should be able to work with the provided automatic checker script “scoreChecker4.py” to give an estimation of your score (the mean energy). The ranking is based on this mean energy, a lower energy is better. For the base points, you should at least reach a mean energy of -0.3 . All submissions will be ranked and the higher rank you can reach the more points you will receive. We’ll check your model implementation manually to make sure no dataset samples are used in the generative process.
Due Date: May 20th 2024
2. **Competition Three:** Please implement a Pytorch reinforcement learning model for the Atari Assault video game. The gymnasium environments will be in “ram” mode. To properly install the gymnasium, you should run `pip install "gymnasium[atari, accept-rom-license]"`. Detailed introduction and instructions about the game can be found at [the Docs of Gymnasium](#) and [the AtariAge page](#). You should implement your model based on the template “reinforcement.py” provided. To check your performance, an automatic checker script “scoreChecker5.py” is provided. We set a limit of 4000 time steps for one simulation. A total of 20 simulations will be run. The best total score is used as your final score. Your model and saving should be able to work with this script. For the base points, you should at least reach a score of 462. All submissions will be ranked and the higher rank you can reach the more points you will receive.
Due Date: May 20th 2024