Homework Assignment 4
601.464/664 Artificial Intelligence Spring 2020
Due: May 2, 2020

April 18, 2020

Deep Learning and Reinforcement Learning

In this part of the assignment, you will implement chess-playing agent with deep reinforcement learning and answer theoretical questions.

Question 1. Open the following google colaboratory notebook.

https://colab.research.google.com/drive/1Kir-xWX8piHPf6pDu-jbWmGz-eNQkJyy

Follow all the steps specified in it. Include link to your solved notebook in your submission. Some parts of the notebook are optional and will not be graded.

Question 2. Explain the difference between fully connected layer and a convolutional layer.

Question 3. What is a softmax function and where is it used in neural networks?

Question 4. Give an example of non-linearities used in neural networks. Why is it necessary to have it in networks?

Question 5. What are the loss functions used for regression and classification?

Question 6. Using what algorithm gradients are usually efficiently computed in neural networks?

Question 7. What is the discount factor γ and how is it used when computing the reward in reinforcement learning?