

Report Assignment 1 - Imitation Learning
LVA-Number 365.250
Ionelia Buzatu - k12008243

The neural network agent is a five layers network with three convolutional layers and two fully connected layers. The choice of the model was mainly due to the fact of having images as input and a small input size 96x96.

The agent was trained with behavioral cloning for five epochs only, because after two epochs the model did not improve any longer suggesting that the model architecture is capable of learning efficiently already from a few epochs but the fact that the model entropy was no longer decreasing after epoch two that suggest that it could be further improved. The batch-size of the training data was set to 32. What was interesting was the fine-tuning of the stride in the convolutional layers, setting a stride of one in the first convolutional layer instead of a stride of four for example, got a significant improvement of the mean score for both the behavioral cloning and the Dagger. That can be explained by the fact that since the image is already reasonably small, a high stride would remove some features that are important for learning. All hidden layers have a relu as activation function.

The evaluation of the neural network agent on the behavioral cloning task obtained a mean score of 553.67 with standard deviation 280.56.

The Dagger implementation was not as straightforward the behavioral agent. Which policy generated the sample is given by a beta with value 0.7 and the reason I have chosen this value is that I want the expert policy to generate most of the new data. I kept the same learning rate and weight decay as for the behavioral cloning agent.

The training was done for ten epochs with fifty dagger iterations. Training the agent with Dagger took a significant amount of time and for sure increasing the dagger iterations would have increased a little more the mean score too. The final mean score for training with the Dagger is a mean score of 481.80 with a standard deviation of 223.63.