Assignment – 4
CS-662: Mobile Virtual Reality and Artificial Intelligence Fall 2024

Note: This is a group assignment. Each group can have 4-6 students. Please mention all team member names and roll numbers on your solution. Please submit a single solution per group in pdf format with still photos of your game for different question and their parts. Also, please provide a link to the zipped project folder for Q1 and Q2 via a Google Drive link.

Submission Deadline: Submit before 11:59 PM on 17th October, 2024.

Question 1: Please do the following in Unity 3D: [04]

a. Please use the RollerBall environment from Q1 of Assignment 3.
b. Now, add the demonstration recorder, and play the game for some number of episodes (please play it long enough for the Unity ML agents to be able to learn from it).
c. Now, add behavioural cloning (BC) with a strength of 0.9 and decrease the strength of extrinsic rewards to 0.5. Train the agent for 30,000 steps. Stop the training by hitting CTRL + C and make the BC strength 0.5 and the strength of the extrinsic reward 1.0. Now, resume the training of the roller agent for another 30,000 steps (you may resume the training by --resume argument in magnets-learn command. Please plot the cumulative reward for this run in TensorBoard.

Question 2: Please use the RollerBall environment from Q1 of Assignment 3. [6]

a. Now, add the demonstration recorder and play the game for several episodes (please play it long enough for the Unity ML agents to learn from it).
b. Now, add BC with a strength of 0.9, GAIL with a strength of 0.9, and Curiosity with a strength of 0.9 (gamma 0.99), and decrease the strength of extrinsic rewards to 0.5. Train the agent for 30,000 steps. Stop the training by hitting CTRL + C and make the BC, GAIL, and Curiosity strength 0.5, respectively, and the strength of the extrinsic reward 1.0. Now, resume the training of the roller agent for another 30,000 steps (you may resume the training by --resume argument in ml agents-learn command. Please plot the cumulative reward for this run in TensorBoard.
c. Please compare the results obtained after 60,000 in Q2 with those in Q1 by using the cumulative reward plot in TensorBoard.