CSYE 7374
Autonomous Learning in Games
Assignment 4 – Deep Reinforcement Learning
Unity ML Agents

Professor: Nik Bear Brown
Due: **Sunday, April 5, 2020**

TAs

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Implement deep reinforcement learning using ML-Agents https://github.com/Unity-Technologies/ml-agents and see https://github.com/Unity-Technologies/ml-agents/blob/master/docs/Readme.md

Pick an ML-Agent environment or find a YouTube tutorial that uses deep reinforcement learning.

https://github.com/Unity-Technologies/ml-agents/blob/master/docs/Learning-Environment-Examples.md

(10 Points) Establish a baseline performance with some default deep learning hyperparameters.

(20 Points) You must explain the CNN hyperparameters you used and show the effect on the performance of at least one important hyperparameter.

(10 Points) Change the AgentAction() function that improve the performance by at least 5%. 5 point for some improvement one more point for each percent improvement.

(10 Points) Change the rewards, how does it effect the performance?

(15 Points) Train with Proximal Policy Optimization, how does it effect the performance?

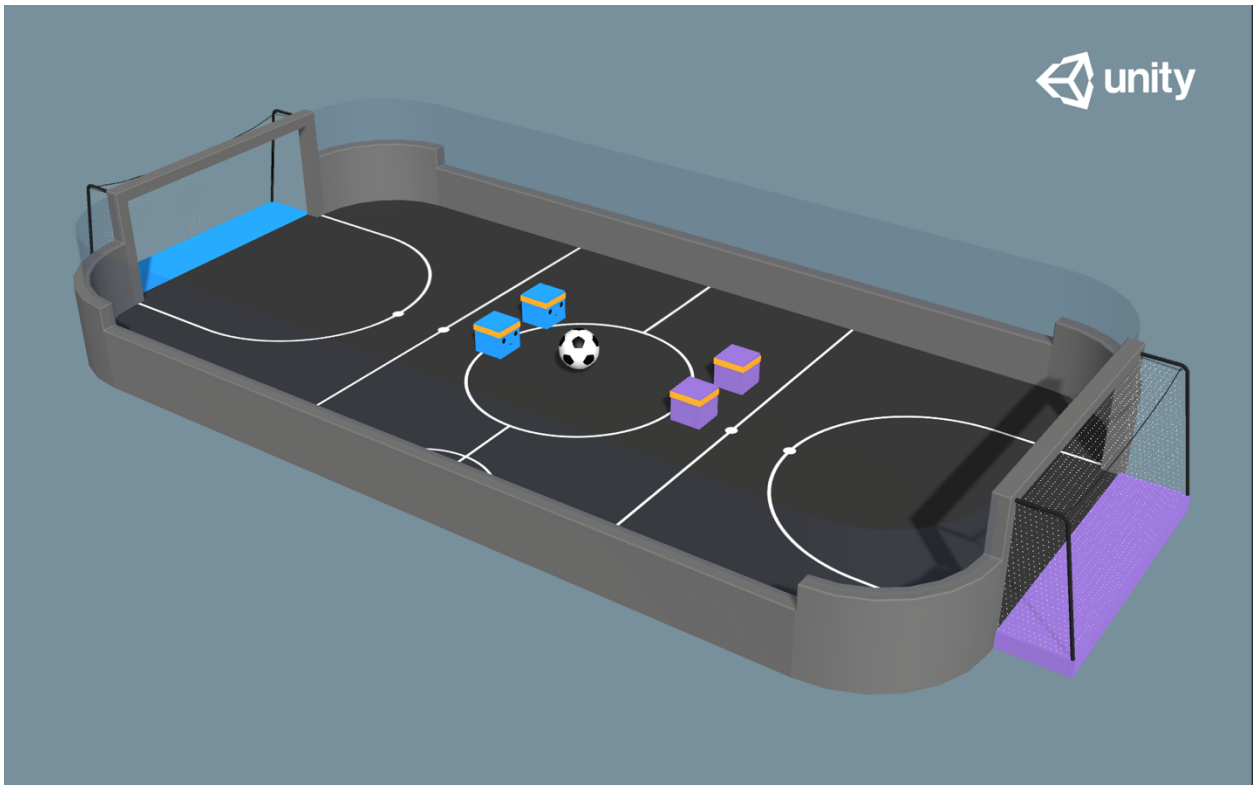
(15 Points) Training with Soft-Actor Critic, how does it effect the performance?

(10 Points) Did I explain my evaluation clearly?

Clearly explain the code and testing.

(10 Points) Video

Create a video that explains what you did.



More information on Unity Machine Learning Agents

Using Machine Learning Agents in a real game: a beginner's guide
https://blogs.unity3d.com/2017/12/11/using-machine-learning-agents-in-a-real-game-a-beginners-guide/?

Introducing ML-Agents v0.2: Curriculum Learning, new environments, and more
https://blogs.unity3d.com/2017/12/08/introducing-ml-agents-v0-2-curriculum-learning-new-environments-and-more/

Introducing: Unity Machine Learning Agents
https://blogs.unity3d.com/2017/09/19/introducing-unity-machine-learning-agents

Unity Machine Learning home page
https://unity3d.com/machine-learning/

Download the latest release on the ML GitHub page.
https://github.com/Unity-Technologies/ml-agents