

CSYE 7374
Autonomous Learning in Games
Assignment 3 – Reinforcement Learning
Unity ML Agents

Professor: Nik Bear Brown

Due: February 29, 2020

TAs

Dikshant Rathi rathi.d@husky.neu.edu

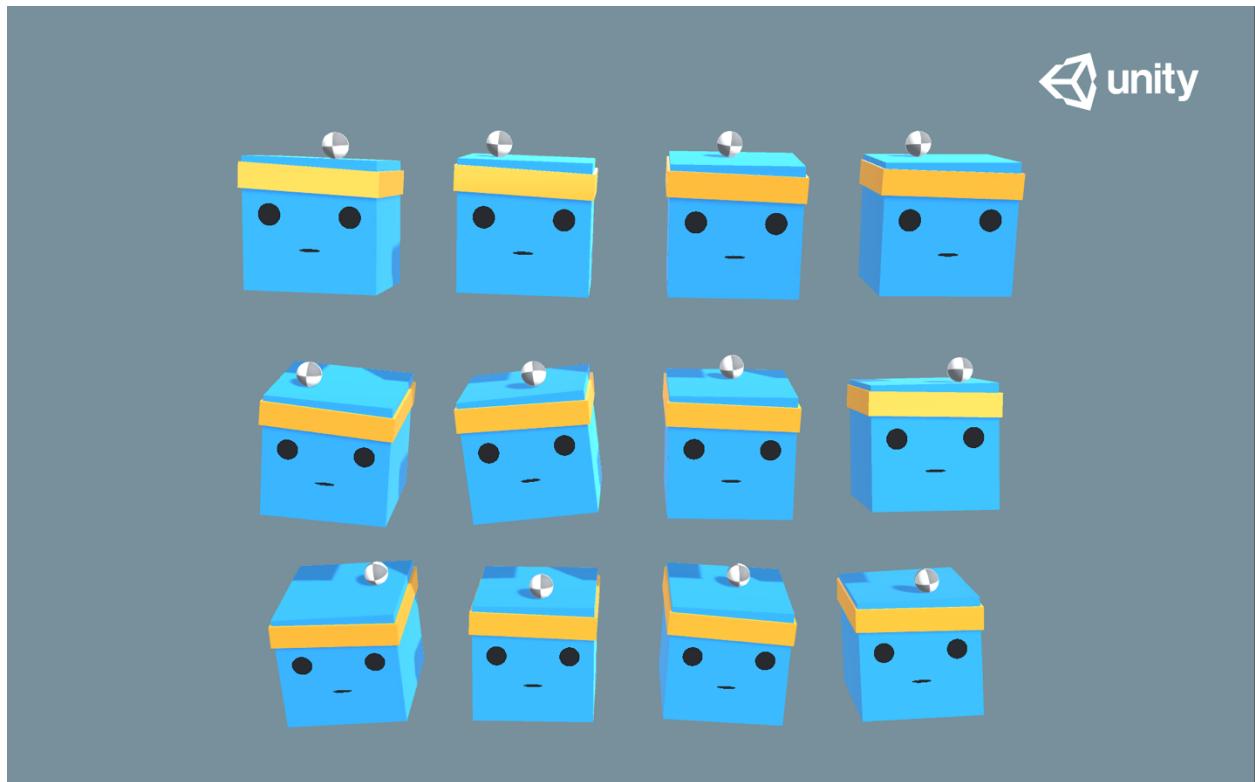
Implement goal oriented behavior using ML-Agents <https://github.com/Unity-Technologies/ml-agents>
and see <https://github.com/Unity-Technologies/ml-agents/blob/master/docs/Readme.md>

(10 Points) Complete Getting Started with the 3D Balance Ball Environment

<https://github.com/Unity-Technologies/ml-agents/blob/master/docs/Getting-Started-with-Balance-Ball.md>

You MUST change the look of the scene so it is obviously visually different from the out of the box the 3D Balance Ball Environment

Show that you got it working.



Part 2. Pick An example environment and extend it.

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

(10 Points) Establish a baseline performance.

(10 Points) You must add at least two more states that improve the performance by at least 5%. 5 point for some improvement one more point for each percent improvement.

(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?

(10 Points) Train with mlagents-learn, how does it effect the performance?

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

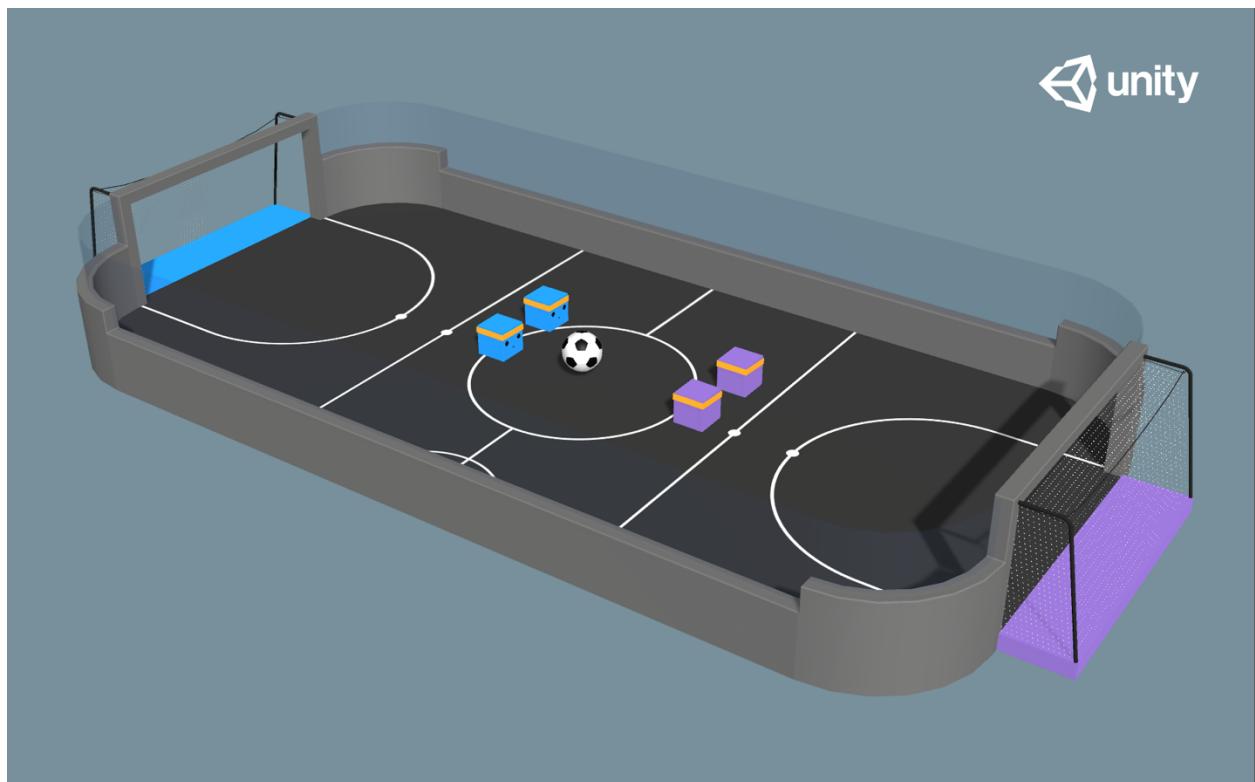
(10 Points) Training with Soft-Actor Critic, how does it effect the performance?

(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>