

## ECEN 689: RL: Reinforcement Learning

### Assignment 3

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The Perseverance Rover successfully landed on Mars on February 18th 2021, this marks a significant step in human space exploration. In this homework we will commemorate this historic event by training an agent using Deep Q Learning to land on the lunar surface. We will use the Lunar Lander Environment (LunarLander-v2) from OpenAI Gym. The environment consists of a lander with 4 discrete actions and a continuous state space. A detailed description of the environment can be found [here](#).

#### Setup Instructions

- Install Box2D.
- If you are running Windows you might encounter problems while installing Box2D, a possible solution is to use Anaconda.
- A preferred way is to create a virtual environment and install gym (`pip install gym`) and Box2D (`pip install box2d`).

#### Instructions

- This assignment includes a report file (Report.ipynb), which consists of questions that need to be answered and plots that need to be shown. Please go over this file before you get started.
- Do not use Reinforcement Learning packages (such as RLlib, Stablebaselines, Garage etc), you should code Deep Q-Learning on your own.
- You may use packages for implementing your function approximators (such as TensorFlow, Keras, PyTorch etc).

#### Submission Details

1. Complete Report.ipynb by answering all questions and linking all supporting images and videos. Save Report.ipynb as a HTML file.
2. Put the following files in a folder named **LastName\_FirstName**
  - HTML version of the report in 1.
  - All the videos and images.
  - Your DQN code. This may be a .py or a .ipynb file. Submit the HTML version if it is a .ipynb file.
3. Zip the **folder** in 2 and submit on eCampus.