Project 1 : Navigation

Implementation

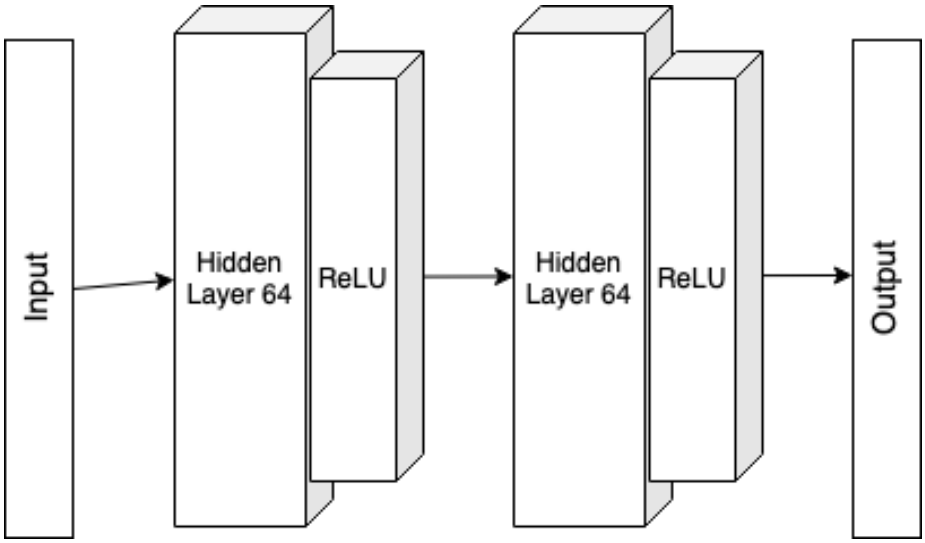
Many algorithm have been implemented to solve this problem. Among the cutting-edge deep reinforcement learning algorithms tried are :

- Deep Q-Nerwork (DQN)
- Double Deep Q-Network
- Dueling Q-Network
- Prioritized Experience Replay

Deep Q-Network For more information see Human-level control through deep reinforcement learning, Mnih and others.

The implementation relies on using Experience Replay and Fixed Q-Targets.

The dense neural network used has 2 hidden fully-connected (FC) layers, 64 nodes each one. This model solved the environment in 415 episodes.



Double Deep Q-Network Implementing double deep Q-Network helps to avoid the overestimation appearing in Deep Q-Network. Using this technics gave the same result for this case study and only solved the environment quicker. This method appeared for the first time in the DeepMind paper Deep Reinforcement Learning with Double Q-learning, Hasselt and others

Prioritized Experience Replay An idea to improve learning with buffer replay is that the agent will better take advantage of experience replay if he takes more time to look at previous experience were more information is to gain. Using this method the algorithm converged to 13 in 352 episodes. See

Prioritized Experience Replay, Schaul and others for lore information (again from DeepMind).