Reinforcement Learning for Atari Games

**Description**

Reinforcement learning is an area of machine learning where an agent learns to make a series of decisions. The agent must learn to navigate an unknown environment to maximize its total reward. Reinforcement learning has been used in many settings including video games, robotics, autonomous vehicles, and healthcare.

**Goal**

Build a web application that utilizes a reinforcement learning algorithm and visualizations to provide interpretability and insight into an agent’s decision-making

**Resources**

Deepmind’s Atari RL paper - <https://arxiv.org/abs/1312.5602>

Collection of common RL algorithms - <https://github.com/openai/baselines>

Collection of environments - <https://gym.openai.com/>

Example visualization - <https://medium.com/@awjuliani/simple-reinforcement-learning-with-tensorflow-part-5-visualizing-an-agents-thoughts-and-actions-4f27b134bb2a>

**Additional challenges**

1. Investigate why some algorithms perform better than others
2. Visualize an algorithm’s robustness across different trials
3. Design environments to exploit an algorithm’s weakness

**Additional resources**

Explaining RL agents - <https://arxiv.org/abs/1711.00138>

Exploiting RL agents - <https://arxiv.org/abs/1904.01318>