StarCraft II AI

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CMSI 402, Spring 2019

Introduction to Project + Purpose

What is StarCraft II?

StarCraft II is a Real-time strategy game where you build an army and defeat your opponents army. There are many different skills you must micromanage to effectively play StarCraft II. At any given instance in time, there are hundreds of different actions one can take.

What is StarCraftII AI?

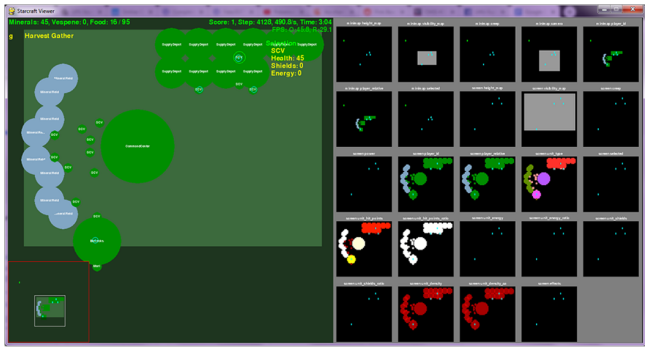
An agent that uses Reinforcement Learning techniques to play different "minigames" provided by the PySC2 API. These minigames better isolate the various skills required to play StarCraft II well.

Why did I develop StarCraftII AI?

It served as a research project alowing me to expand my knowledge of Reinforcement Learning and to put it into practice. Additionally, DeepMind's most recent focus has ben on StarCraft II, meaning this topic is relevant as an on going topic of research.

Human View of the Game

Agent's View of the Game



Technologies Used

Numpy

Library in Python adding support for large, multi-dimensional arrays. Used to easily operate on the Q-tables.

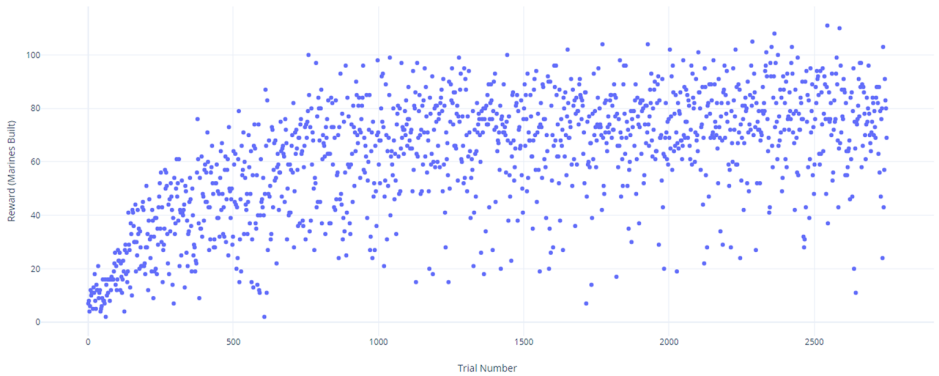
Pandas

Library in Python for data manipulation and analysis. Used to better analyze the data in Q-tables

PySC2

DeepMind's Python component of the StarCraft II Learning Environment. PySC2 provides an interface for Reinforcement Learning agents to interact with StarCraft II. Used to do all the data extraction from StarCraft II to our agent.

Data results from training the agent on the "BuildMarines" minigame



Citations

Vinyals, Oriol. (Aug 16, 2017). StarCraft II: A New Challenge for Reinforcement Learning. (arXiv:1708.04782v1). Retrieved from Cornell University Online Archive, April 26 2019

Brown, S., & Brown, S. (2017, September 05). Building a Basic PySC2 Agent. Retrieved from https://chatbotslife.com/building-a-basic-pysc2-agent-b109cde1477c

Zhou, Morvan. (Nov 25, 2018). RL_brain.py. https://github.com/MorvanZhou/Reinforcement-learning-with-tensorflow/tree/master/contents/2_Q_Learning_maze