Team AFK Project Proposal

Big Idea: We are going to attempt to train a computer through machine learning to play a simple game. By the end of this we hope to have a working code that will play through a round of Agar.io (subject to change) . In doing this project we will explore machine learning as well as having the computer interface with a game, both by receiving output from it (level layout, enemy location, etc) and giving input (controlling the character, mouse, keyboard).

Learning Goals:
- Nick: Learning effective image processing in conjunction with machine learning to provide a smooth AI controller that does not have too much lag
- Yichen: Learning to understand and apply appropriate machine learning algorithms to the problem and explore new useful python libraries.
- Ben: Learning to research and use libraries more effectively through implementation input take-in and in response simulate specific key presses.
- Seungin : Learning to choose appropriate machine learning algorithms for the project and learn how to implement them using python libraries like scikit-learn or TensorFlow.
- Alex: Improved confidence with group and individual programming, in addition to utilizing neural networks.

Implementation Plan: Identify a game and goal of the machine learning. Then explore and learn libraries that will benefit us in our goal (NeuroEvolution of Augmenting Topologies (NEAT) seems to be similar to what we want). We can use the cTypes library to simulate key presses. We will then implement this in python running behind an actual game emulation.

Project Schedule:
End of week 1: Identify libraries and games to use
End of week 2: Understand libraries, have components working independent of one another
End of week 3: Basic integrated implementation of simulated key press, reading levels, progress in levels
                Begin website and presentation work
End of week 4: Complete project website and presentation
End of week 5: Poster created and printed, working machine learning
Part way through week 6: Clean up code, work out final presentation details

Collaboration Plan:
Our preliminary plan is that Nick and Seugin will work on Image Processing, Alex and Yichen will work on Machine Learning, and Ben will work on the Input. These three sections interlope and are subject to change and expand focus as our development goes on.

Risks:
Potentially overscoping, may need to change game
Issues with controlling and pushing data to the server

Neural Networks take time