



Abstract:

The goal of this research is to create flexibly intelligent agents.

I am creating the environment in for the agents to interact with in unity.

For the brains of the agents, I am using a python server to communicate with the agents' bodies. The bodies tell the server about the environment and the server tells the agent what to do in the environment.

Introduction:

Most current Artificial Intelligences are exceptionally skilled in one task; however, they are unskilled in tangential fields. So, researchers are now trying to make flexible intelligences.

Most researchers in this field are using an environment with a grid. I am going to use a grid-less environment.

Method:

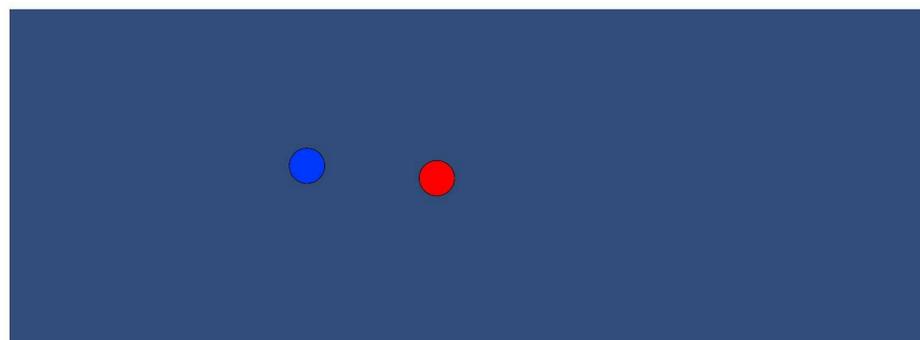
A few weeks were used to get familiar with Unity and server, since I have not used either before.

Then, I started to work on creating the current environment. Where two circles just do random walks around the environment. Once they collide into a wall or each other, they send a message to the server asking for new directions. Next, I will be implementing a better user interface, so it is easier to work with.

Additional Features:

I created the ability to save where the agents left off so that they could continue if the simulation were stopped for some reason.

I also implemented a replay feature so that I could see what they had been doing; Furthermore, I added the ability to start when you wanted in the replay as well as how fast to go through the replay.



Future Work:

The goals I want to accomplish next are to create a more advanced environment with more features and have the agents have more to keep track of and maintain.

Add personalities/emotions to the agents to see how this might affect their decision making.

Then, I can do experiments with the agents to see what makes the agents more flexibly intelligent and what makes them less.

Personality and Emotions:

I plan to initially start with Plutchik's Wheel of emotions as a model for the agents' emotion, which might change in the future if I decide it does not work well enough.

I plan to have the emotional framework such that each agent will have a current mood and it will also have a set of emotions related to each object it has interacted with so which will show how it will influence the agent on successive interactions.

I may also include personality traits that can be changed such as aggression, curiosity, introvert/extrovert, etc.

Future Research:

Once all of the planned work has been finished, I will test how changing initializations such as position, different personality traits and emotions, how many other agents are there, how fast certain stats decay/increase and other stats and values, on both the client and server side, affect the agents' ability to learn flexibly.

References:

I adapted some server code from:
Python: <https://kuntalchandra.wordpress.com/2017/08/23/python-socket-programming-server-client-application-using-threads/>
Unity: <https://forum.unity.com/threads/writing-and-reading-a-socket-with-tcp.282071/>

I get a lot of programming help from:
<https://docs.unity3d.com/Manual/index.html>