Ben Elfner

Senior Project Individual Assignment

My main contribution to this project was the server which controlled communication and the neural networks. It took in information sent over tcp from the game and converted it to a format that could be passed to a neural network. With the data converted, the information is then used to train the neural network and predict what the next action should be. That data is then sent back to the game. To reach this state, I slowly built up the pipeline making sure that each part functioned as it should before I moved on. Working this way allowed me to incrementally test the pipeline by observing how each new part changed the data flowing through it. Adding the neural network in was much harder due to the amount of supporting code needed to make it work forcing it to be mostly complete before I was able to hook it up with the pipeline.

Some of the skills I learned throughout creating this project were managing large projects and integrating seemingly incomparable systems. The largest success was making the entire communication system work with the neural network and the game. Unfortunately, the neural network was by far the largest obstacle due to the difficulty I had training it. Several factors were causing this including, the method of training chosen, the speed of the computer, the speed of communication between the server and the game, and the general difficulty with training neural networks.

Our group accomplished creating a system where an AI driven by a neural network can learn to control a 2d platforming game based only on what a human player would see and using the same controls a human would use. We were also able to demonstrate the potential of the system even though we did not reach our initial goals. Working in a group helped me appreciate how the combined output of a group can be better than the sum of the individual skills of the group members. Getting started was more difficult than working on our own since we had to divide up the work in a manner that was fair and played to our individual strengths.

The design of our project did help with this process since it was composed of two parts each suited to our strengths and interests (machine learning for me and game design for Jack). This is not to say we did individual work rather we would discuss how the design of each part would play to the strengths of the other part. Overall, I would say we each put in equal effort to this project both in work and influence on the others' part.