

Senior Design (492) Biweekly Report

Team Name: sdmay21-proj033

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Report Period: Feb 22 - Mar 1

Summary of Progress in this Period

These past two weeks we have spent doing a myriad of different tasks.

We started working on getting Docker set up so there would be one universal image that could be downloaded and run on all of our team members' devices as well as future people working on the project. This should significantly decrease the required setup time to get the simulation environment and code running for our project. Additionally, we began to research more about GNNs (graph neural networks) to incorporate into our code for the drone to learn. In the past period, we were able to get the basics implemented from the textbook to begin further adjustments.

Pending Issues

The CNN policy is currently throwing an error due to the incorrect size input. The GNN still needs some more refining to get to working condition, more specifically we are running into trouble with the sampling of the action vector of the Drone. When it comes to the docker image we are having trouble trying to integrate the environment into an Ubuntu docker image. The heuristics team is still working on interfacing with AirSim in new ways so they can try to pull out more detailed data than what we have been able to collect in the past.

Plans for Upcoming Reporting Period

There is still work to be done on the Docker image. Several members of our team will be focused on getting an Ubuntu image with Unreal engine to run on our Windows servers these next two weeks. On March 2nd one of our team members is planning to meet with a professor who offered to lend a hand in setting up the Docker image with them, so we are hoping this

should be done very soon. The team members focused on the GNN will begin to customize the textbook code to fit our specific image size, actions, and other needs. We will also work to adjust the sample space settings of our simulation to output the expected size for the CNN policy to start working. On top of this some of our team members will be working on trying are analyzing data from training prototype versions of our RL model to see what kind of heuristics they can draw out of the environment we are working with so that we can find more innovative ways to train the drone when we have a fully working RL model.
