EE/CprE/SE 4920 WEEKLY REPORT 02

January 31 - February 13

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Distributing a Fleet of Drones over an Area with No-Fly Zones

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Nicholas Kokott - Team Organizer
Melani Hodge - Algorithm Design/Implementation
Cole Stuedeman - Testing
Everett Duffy - Component/Module Design
Ken Schueman - Advisor Communication
Samuel Russett - Research Discovery and Testing

Weekly Summary

Frontend Development

This past week, our primary focus has been on finalizing a fully functional, clickable frontend. Given that we have been waiting over 18 weeks for the algorithm function promised by the graduate student we are collaborating with, the frontend team determined that ensuring a well-designed and fully operational user interface before integrating the algorithm would be the best approach for overall workflow and team efficiency.

Backend Development

On the backend, significant effort has been dedicated to developing the REST API and WebSocket functionality. The REST API is essential for handling requests related to loading GeoJSON data onto the map, while the WebSocket is being implemented to facilitate real-time drone movement updates. These backend components are critical for ensuring seamless data communication and interaction within the application.

Past week accomplishments

Nick Kokott: In the past week I was working on getting a websocket room for displaying algorithm data as it was computed out to the frontend. I had to go through several different resources, and it may have taken some time, but I was able to get it completed. As well as this I had to refactor the database a bit, for some reason in django a one to many relation does not exist and is just a foreign key. This made me believe I had to set up the relations backwards to what they needed to be. To fix this I had to learn how to revert to a previous migration, and then remove the incorrect ones to properly set the database to where it needed to be.| This weeks: 12 hours | Total: 59 hours

Kenneth Schueman: This past week I continued fleshing out the fontend design, and integrating many quality of life features for both the developers and users. I also overhauled the GitLab page to make use of their built in issue, issue board and milestone features. (8 hours) | Total: 33 Hours

Everett Duffy: This week I have implemented the REST API on the backend for communication with the front end. Once the frontend has their portion ready, we will be ready to begin testing all of our API calls. (8 hours) | Total: 31 hours

Cole Stuedeman: In the past week I have been experimenting with simple tests with Django on the backend. I am continuing to learn more about how Django works with python in order to make more complex test cases. (7 hours) | Total: 28 hours

Sam Russett: Due to illness, I was not able to accomplish all I had set out to do last week, and have also temporarily switched focus from backend to helping out the frontend team. I verified that my frontend environment was working properly, and discussed with the rest of the frontend team on what additional pages need to be created. This week: 3 hours | Total: 28 hours

Melani Hodge: This week I worked on setting up unit tests with React Testing Library and integration tests with Playwright in the frontend of our application. I also read some documentation in mapbox on setting up the polygon overlays on our maps to show the no-fly zones. Finally, I took some courses and did some research on setting up a CI/CD pipeline inside of GitLab where we can keep track of our merge requests and deployments. This week: 6 hours | Total: 33 hours

Pending issues ***(If applicable: Were there any unexpected complications? Please elaborate.)***

We need to be able to add in the partitioning code from the PhD student's code base. Currently there is no way to be able to do that, but at least we can pull in synthetic no-fly zones to demonstrate for the time being.

Comments and extended discussion ***(Optional)***

The algorithm code needs extensive refactoring before it can be used efficiently within our system.

Plans for the upcoming week

Nick Kokott: In this coming week I plan to set up the newly given backend code from the PhD student to a rest API and parsing the data that comes from the random generation. As of right now it spits out everything in a one line, very lengthy json file. So parsing that and setting up objects to be set back to the front end will be vital.

Kenneth Schueman: I will be working on finalizing the frontend and developing the systems to communicate with the backend. After that I will be moving to the backend team to work on parsing the datasets to make it much more efficient to transfer the data to the frontend.

Everett Duffy: I will be assisting Nick in implementing the algorithms needed to continue our progress. As Nick mentioned, we have a lot of cleaning up to do to easily read and process the data output from the algorithms.

Cole Stuedeman: I will be integrating simple tests into coverage tests on the backend. I will also be exploring ways to make more effective and efficient tests by becoming more familiar with Django.

Sam Russett: I will make any necessary issues for additional frontend pages. I will also continue troubleshooting my backend setup and verifying my local database is working properly, in case I move back to the backend team.

Melani Hodge: This upcoming week I will be implementing the CI/CD pipeline in GitLab to ensure our work can be continuously pushed and deployed. I will also be assisting in setting up the server to run our web application on.

Summary of weekly advisor meeting (*If applicable/optional)*

This past weeks advisor meeting was very important because we finally gained access to the algorithm necessary to make out entire focal point of our project work. While this code is in a much worse state then anticipated, it is still crucial we got eyes on this to start developing out systems around it due to the complexity of what we are trying to accomplish.