EE/CprE/SE 491 WEEKLY REPORT 10

11/15/2024 - 11/21/2024

sdmay25-21

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

Algorithm Updates

Project Description

The sweep line axis is provided by the user (backend constant). A specified metric determines the partitioning direction (vertical/horizontal).

Input Processing:

- Accepts a list of polygons
- Polygons created from counter-clockwise point sequences
- KD-Tree splitting based on cartesian point location after sweep line execution
- Takes in the number of drones
- Takes in the region from a user that the no-fly zones are drawn on

The Assembly Library feature usage for section splitting needs clarification.

Action Items

1. Review Materials:
    - Reference previous senior design document for formatting: sdmay23-34 design document.
    - Complete the testing portion of the design document based on the passed design document.s
    - Research FAA regulations for inclusion
    - Review slides provided by the project advisor for Ethics related to our project.

Weekly Summary

We have been stalled by the fact that a large portion of our project is based on an algorithm developed by a graduate student. We have already:

- Have a front-end prototype
- Have a WebSocket and API connecting the front end and backend with dummy data.
- Researching ways to store data using a DBMS
- Have access to GIS data and data parsing

Once we have this algorithm, we will be able to achieve:

- Create KD-Tree parsing and segment deviation of the operation field
- Pass relevant data to the frontend to animate and complete project task

Team Member Contributions

- Sam: Framework research and KD/BAR trees study (4 hrs) | Total: 6 hrs
- Cole: Data transfer optimization research (3 hrs) | Total: 2 hrs
- Nick: Frontend-backend communication implementation (4 hrs) | Total: 5 hrs
- Everett: Frontend functionality exploration (3 hrs) | Total: 4 hrs
- Melani: PostgreSQL service evaluation (3 hrs) | Total: 5 hrs
- Ken: Full-stack development (16 hrs) | Total: 6 hrs

Challenges

Primary: Not having the most crucial aspect, the algorithms, of our project

Pending:
Clarification is needed on additional algorithms from PhD student.

Next Week's Goals

1. Frontend Development:
    - Continue UX/UI experimentation
    - Implement MapBox API for improved readability
2. Backend Development:
    - PostgreSQL integration
    - PhD student algorithm implementation
3. New Feature:
    - Develop no-fly zone plotting functionality

Recent Advisor Meeting Outcomes

Key discussion points:

- Research ethics related to our project
- Create criteria for a successful test case