EE/CprE/SE 491 WEEKLY REPORT 08

11/1/2024 - 11/7/2024

sdmay25-21

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

Trajcevski, Goce - Advisor

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

- The sweep line axis is provided by the user (backend constant)
- Partitioning direction (vertical/horizontal) determined by a specified metric
- 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
- Assembly Library feature usage for section splitting (needs clarification)

Action Items

1. Review Materials:
    - Examine the Overlay section from "Area and Perimeter based experiments and proofs," particularly slide 99
    - Reference previous senior design document for formatting: sdmay23-34 design document.
    - Research FAA regulations for inclusion
    - Review "Drone-Based Delivery Systems: A Survey on Route Planning" for citations
2. Priority Tasks:
    - Submit the Design Document draft to Goce for review

Weekly Summary

We reached a significant milestone with the receipt of the core algorithm information, enabling us to:

- Initialize backend development
- Begin pipeline integration with frontend
- Finalize and proceed with frontend design implementation
- Continue PostgreSQL and Python implementation for server/application state management

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: Resolved - Received flight path algorithm information
- Pending:
    - Clarification is needed on additional algorithms from PhD student
    - Data structure implementation decisions

Next Week's Goals

1. Frontend Development:
    - Continue UX/UI experimentation
    - Implement frontend rework
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:

- Frontend design experimentation
- PostgreSQL integration strategy
- Algorithm implementation approach
- No-fly zone plotting requirements