

Design - Part 2

Project Team 10

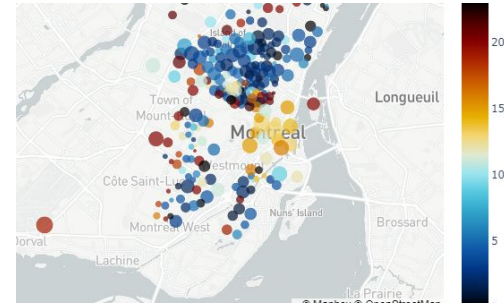
Project Title : *“Visualizing Probabilistic Whereabouts of
Moving Objects”*

Advisor and Client: Dr. Goce Trajcevski

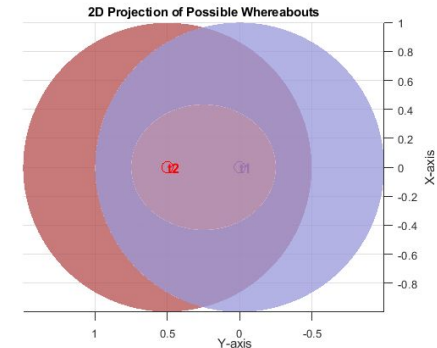
Project Overview

For our project we are going to design & create a web-based application for visualizing the probabilistic whereabouts of moving objects.

- Given a dataset of positions varied with time, use a set of tools to express the probability of the object existing at a given location in between any two samples (Generalize to chains of samples).
- Provide users with an interface that enables the user to enter queries and visualize results.



Plotted Data on a Map



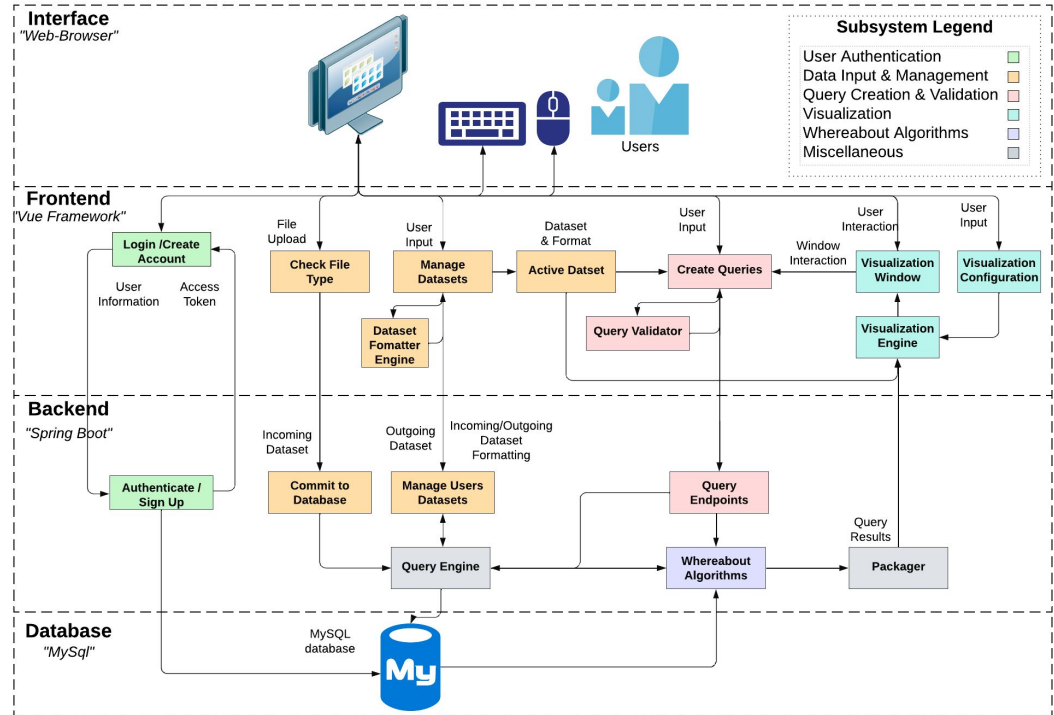
Visualizing Whereabouts in Space

Detailed Design and Visuals

Systems Diagram

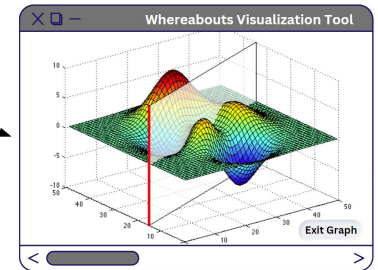
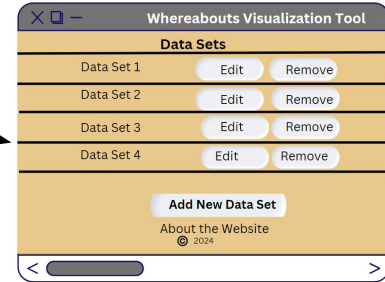
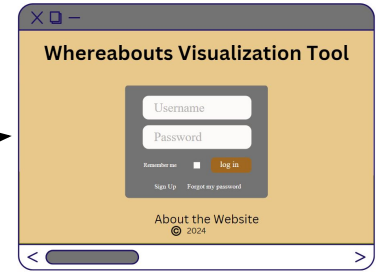
5 Main Stages:

- User Authentication
- Data Input and Management
- Query Creation and Validation
- Visualization
- Whereabouts Algorithms



Functionality

- Users will create an account or login
- After login, will be able to view current data sets
 - Edit or Remove existing data sets
 - Add a new data set
- View output of visualization and whereabouts algorithm chosen
- Share output as image or link



Technology Considerations

Three Main Technology Considerations

- Vue.js
 - Advantages
 - Component-Based Architecture
 - Easy integration with Mapbox
 - Disadvantages
 - Performance during large visualizations
- IntelliJ
 - Advantages
 - Spring Specific features
 - Help with Debugging and Errors
 - Disadvantages
 - Not New User Friendly
- Mapbox
 - Advantages
 - Helps Offset the Possible Performance Issues with Vue
 - Disadvantages
 - Possible Issues With Amount of Features

Areas of Concern and Development

- Time Constraints
 - User Interface Functionality
 - Processing & Saving times Limiting Algorithm(s)
 - Features Available
 - Dataset Handling
 - Frontend-Backend Transaction Speed Limitations
 - Data Storage
 - Processing Different Query Types Well
- Technological Limitations
 - Back-End Server
 - VM Reliability Concerns
 - ETG Processing speed
 - Framework
 - Scalability