Semantic Visit Aware Recommendation of Hotels

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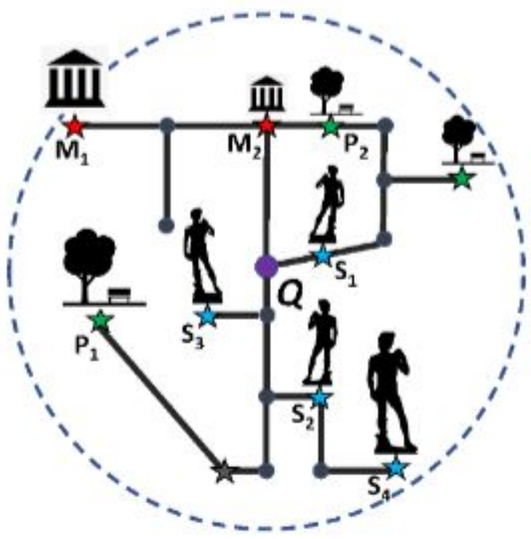
Overview



Problem

Our client developed an algorithm that can efficiently determine an optimally diverse set of points of interest (PoIs) as well as the optimal route between them, given constraints. We developed a system that implements the solution.

Solution

We have developed a prototype system that:

- Enables specification of semantic PoIs
- Recommends both hotels and routes to visit concrete PoIs

Target Users

- Tourist
- Educator
- Business Professional

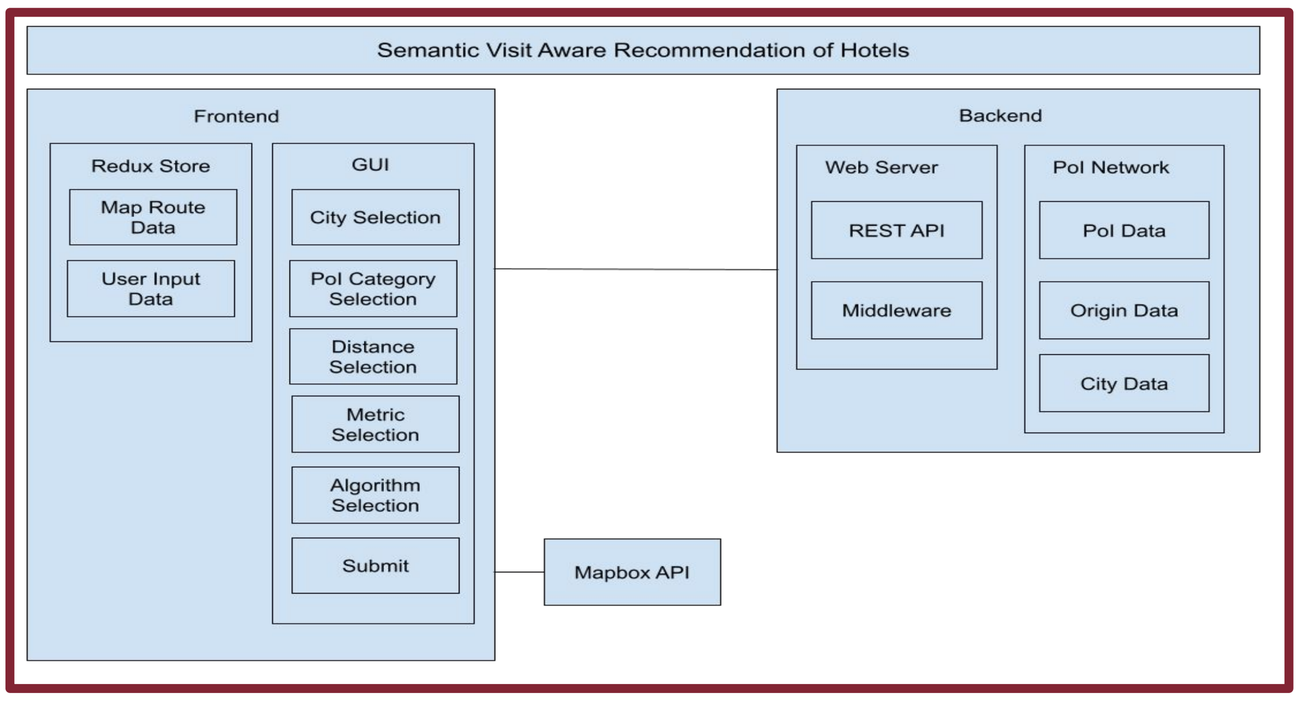
Requirements

- User should be able to easily modify constraints
  - Targeted city
  - PoI choices
  - Algorithm
  - Distance
- Display routes fulfilling constraints within seconds
- Code should be extensible and maintainable

Implementation

Methodology

- Client-server model used to define the relationship between the backend and the frontend.
- Products used for design inspiration:
  - Google Maps
  - Waze
  - Roadtrippers
- Design decisions:
  - Prioritize the tourist's workflow.
  - Hide settings the tourist won't use.
  - Make the map interactable through both itself and a menu.

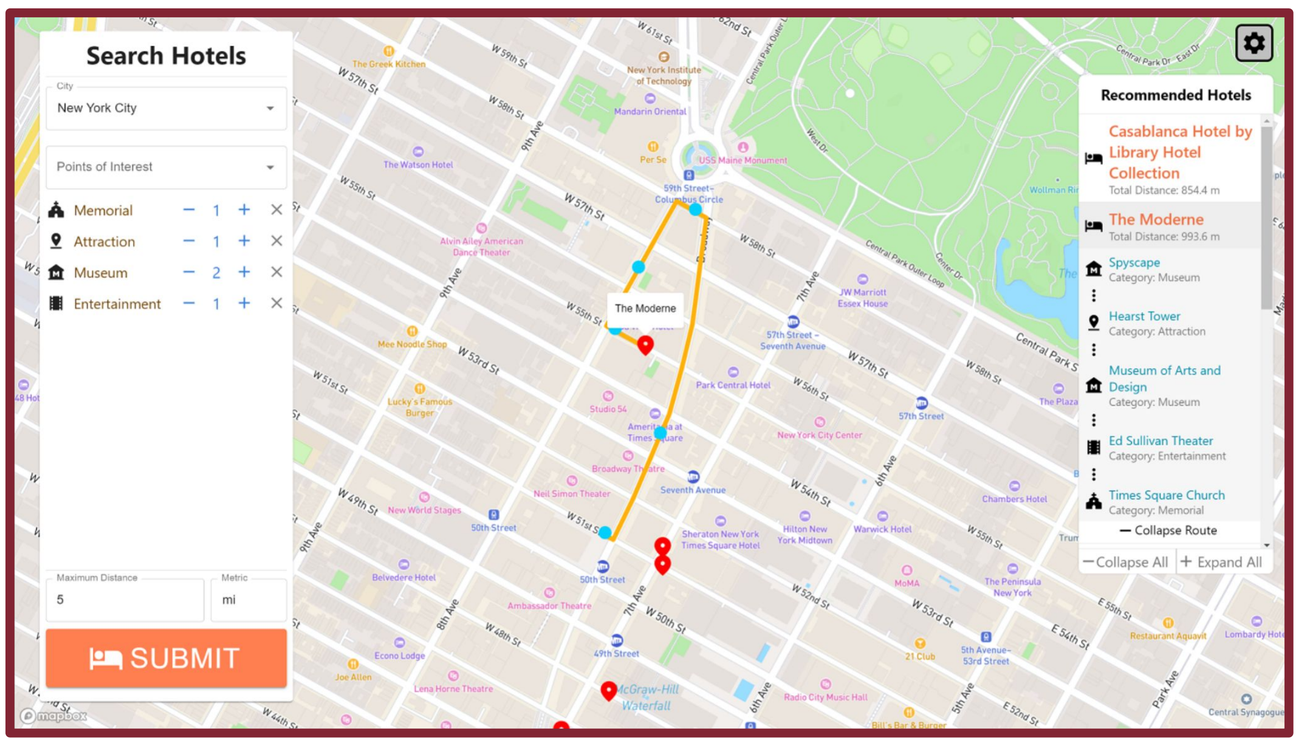


Implementation

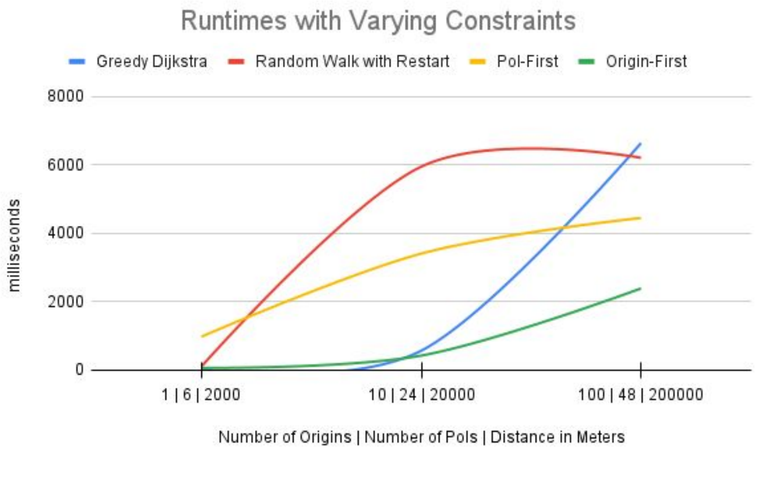
- Frontend
  - React - Used to create reusable components
  - Redux - Allowed for easy state management
  - Typescript - Typing features allow for better readability and usability
  - MapBox API - Used for route and map visualization
- Backend
  - Python - Allowed for better integration with client's code
  - Flask - Used for creating REST API
  - Apache HTTP Web Server - Used for hosting our application

Testing

- Unit Testing
  - UI components and functions used by API
- Interface Testing
  - API endpoint availability and error handling
- Integration Testing
  - Combination of city selection and MapBox visualization
- System Testing
  - Complete app functionality and performance
- Regression Testing
  - CI/CD Pipeline
- Acceptance Testing
  - Feedback from client during meetings



Results



Summary

- Recommends users:
  - Hotels for New York City
  - Airbnbs for Chicago
- Visualizes routes to semantically diverse PoIs from a certain hotel
- System Performance
  - Responds in milliseconds to seconds based on given constraints

Impact

- Promotes tourist exploration
- Enhances visitor experience
- Promotes local businesses

Conclusion

- Our work provides a way for our client to visualize their algorithms
- System provides the combined implementation of route recommendation (e.g. Google Maps) and hotel selection (e.g. Expedia)
- The algorithms have great potential to be used in a variety of settings