EleNa: Elevation-based Navigation

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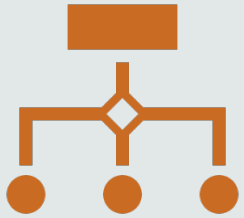
Introduction

- EleNa optimizes hiking and biking routes based on elevation gain preferences.
- Importance: enhancing fitness routines, aligning with individual goals, and promoting well-being.

Challenges & Solutions:



Integrating elevation data effectively with routing algorithms.

Balancing elevation gain preference with distance constraints.

Utilizing OpenStreetMap and Digital Elevation Model (DEM) services for accurate data.

Design Overview

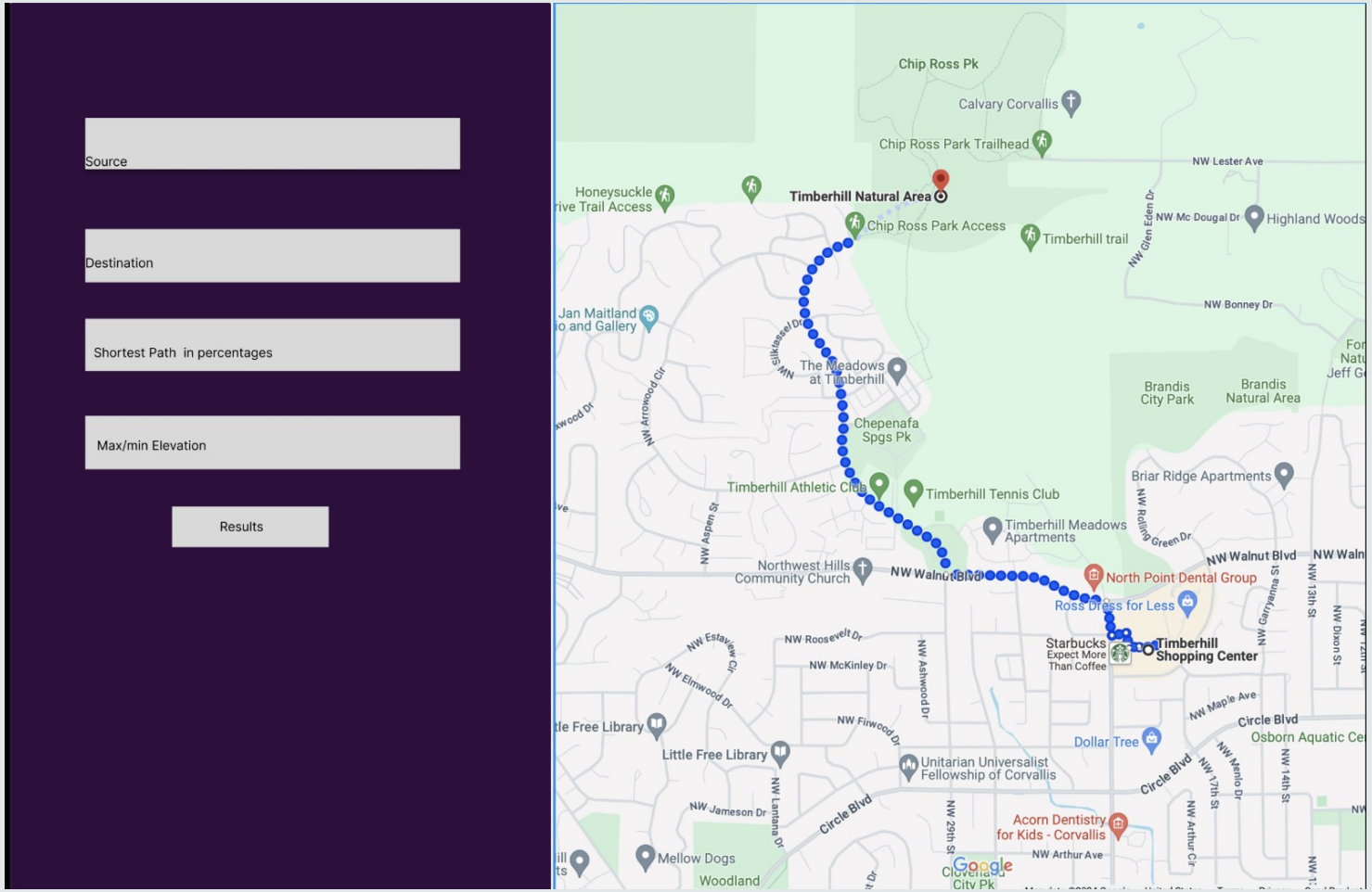
Data model entities: Node, Edge, Graph.

Data population from OSM and DEM sources.

Utilizing Dijkstra's and A* algorithms for route optimization.

Output: User-friendly interface for route visualization.

Early Design



Testing & Evaluation

Rigorous functionality testing: correctness, performance, user experience- Testing techniques include **Unit Testing, Integration Testing, System Testing, Load Testing, Stress Testing, Accessibility Testing,User Interface (UI) Testing.**

Algorithm evaluation: efficiency, optimization quality.Testing techniques include **Time Complexity Analysis, Space Complexity Analysis.**

Real-world validation and iterative improvement based on user feedback.Testing techniques include **Beta Testing, User Surveys and Interviews.**

Project Plan

Week 4: Analysis

Functional Requirements: Mani

Non-Functional Requirements: Anushka

Architecture Design: Twinkle

Tech-stack Selection: All Team Members

Week 5: UI/UX Design

UI/UX Design: Mani

OpenStreetMap Integration: Anushka

DEM Integration: Twinkle Reddy

Week 6: Implementation

UI/UX Implementation: Mani

Routing Algorithm Implementation: Anushka

OSM and DEM Integration: Twinkle

Week 7: Testing and Bug Fixing

Unit Testing: Mani

Integration Testing: Anushka

Manual Testing and User Acceptance Testing: Twinkle

Week 8: Deployment

Application Deployment and Documentation: All Team Members

Project Checkpoints

Weekly Meetings (Mondays): Discuss and distribute tasks for the week.

Mid-week Status Checks (Wednesdays): Ensure progress and address any issues via Google Meet.

Task Review (Saturdays): Wrap up tasks for the week and prepare for the next week's activities.

Conclusion

EleNa offers personalized route optimization for hikers and bikers based on elevation preferences, enhancing outdoor experiences.

By integrating elevation data with advanced routing algorithms, EleNa promotes fitness and individual well-being during outdoor activities.

EleNa represents a sophisticated solution for elevation-based navigation, poised to make a positive impact on outdoor enthusiasts worldwide.

Thank you