Status Report 5

EE / CprE / SE 492 - sdmay25-06

Iowa Adventure Cyclists Course Creator

Week 9 Report

August 2024 - May 2025

Client & Faculty Advisor: Julie Rursch

Team Members

Kayley Clark - Technical Lead

Tanner Smith - Algorithm Architect

Nayma Garcia - UI/UX lead

Grant Pierce - Client Relation Manager

Nick Thoms - Testing

Eli Newland - Task Manager

Wan Elisa Wan Sarif - Component Design

Summary

The team has been working to format the data from the DOT such that it can be stored into our mySQL database. Eli worked on getting the data into the DOT database, with server issues Kayley helped debug. Once the data was properly in the database, Tanner and Eli realized that the road segments from the DOT are not properly segmented when handling intersections. This proposes a major flaw in our data set, and the team is working on finding another data set to use to resolve the issue. Kayley found the openstreetmaps API, and is working on finding a way to make it compatible with our previously finished algorithm Tanner created.

Nayma continued work on exporting the GPX data and has configured the frontend to accomplish this feature, the only roadblock being the backend needing to send coordinate points

corresponding to a route. Preferences for the user is also finished, and all branches have been merged together so the team is all working on the same page.

Past Week Accomplishments

Formatted data into database from DOT.

Exporting coordinate points into GPX data.

Pending Issues

Road data from DOT is not segmented properly this leads to two solutions 1. find a new data source, or 2. individually segment each road (this will be too time consuming)

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Kayley Clark	Merged all branches, configuring the frontend and backend with architecture changes. Found a new API (open street map) to work with Tanners algorithm as DOT data is found to be difficult with segments. Worked on a plan to get that into a form for the A* algorithm	8	90
Tanner Smith	Started creating a "route" object on the backend for storing routes and began implementing new route object. Finished getting the backend code to communicate and take info from DB to create the road graph. Restructured backend architecture for organization which adding new folders for DB interactions, endpoints, config, and DB objects, and types.	8	96
Nayma Garcia	Continued work on enhancing frontend UI screens. Started talking with Tanner to see how route data will be formatted in the backend and how the frontend should expect to receive it so we can start adjusting	7	87

	the frontend in preparation for connecting the back and front end. Also continued work in exporting GPX data. It can now be "sent" anywhere, including to the Garmin Connect app.		
Grant Pierce	Advanced the app's security framework by implementing key features: a backend audit log to monitor and record critical user actions (e.g., logins, data modifications) with metadata like IP addresses and timestamps for compliance and incident response; role-based access control (RBAC) via Okta, defining granular user roles (admin, rider, guest) to enforce least-privilege permissions for sensitive operations; and refined session management, including shortened token lifespans, secure cookie attributes (HttpOnly), and automated session termination after inactivity. These efforts bolster security ahead of integration testing while maintaining a seamless user experience.	10	92
Nick Thoms	None	0	79
Eli Newland	Worked to get the DOT data properly formatted in the database for ease of use. Removed some superfluous data fields and designed a mechanism to update the data efficiently when the data is updated	8	94
Wan Elisa Wan Sarif	Worked on integrating the account system throughout the frontend, ensuring features like login, favourite routes, and the account page are functional. Also assisted in refining the user session handling in collaboration with Grant and Nayma	7	86

Plans for Coming Week

Next Week's Security Preperations:

GRANT: Grant will prioritize securing the app's integration phase by focusing on penetration testing prep (using OWASP ZAP to scan endpoints for vulnerabilities like misconfigured CORS), migrating hardcoded secrets to AWS Secrets Manager, and stress-testing RBAC policies to ensure roles like "admin" and "users" enforce strict access controls. I'll also enhance the audit log with Splunk alerts for suspicious activity (such as rapid failed logins) and mask sensitive data to align with GDPR. Also plan to automate security scans in CI/CD and a review of client-side data storage with the frontend team will round out efforts. Stretch goals include drafting an incident response plan and exploring passwordless logins via Okta for future UX-security balance.

Tanner: Tanner will work to finish the implementation of the "route" object on the backend and, if progress on the database goes smoothly, will work on getting code to send the data to the front end in a format that can be used by the front end and displayed visually. Additionally, he will work on implementing the saving feature for routes to save to the database. This will require further communication with the front end as to how current session information will be accessed and stored within the application to then query the database and store with the correct user information.

Nayma: Nayma will work on finishing up the frontend UI to have a consistent look and ensure all pages are created. She will also work on refactoring the frontend code to get ready for receiving data from the backend once we get to the point of connecting them. She will also work with Grant & Tanner to find the best way to store user data for each "session". This will allow the front and backend to communicate which user is currently active and work with only their data.

Eli: Eli will work on implementing the backend functionality of the friends feature. This will allow the existing frontend friends functionality to be connected to the backend and allow for the creation of unit and integration testing of the feature. He will also be assisting Tanner in testing the feasibility of integrating OSM data into the route planning.

Kayley: Will work on the data API for Tanners algorithm, this is the main functionality of our application and after figuring out how to parse the open source data or API we can move it to the algorithm, which will then need configured on the frontend to display. Within the next week the backend (data and algorithm) should be figured out, so that we can connect it to the frontend for display.

Wan Elisa: Wan Elisa will continue working on integrating the account system throughout the frontend, ensuring smooth functionality for user authentication, profile management, and

personalized features like saving favorite routes. She will also collaborate with the backend team to refine session handling and data storage mechanisms for account-related functionalities.

Nick: None.