

Final Project Report

Project title: EV Battery Explorer Website

Name: Munkhbold Khulangoo

Student ID: 202455472

Department: Computer Science and Engineering (AI)

1. Project Overview

The EV Battery Explorer is a responsive website designed to inform users about and compare electric vehicle (EV) batteries. The goal of the site is to create a modern, user-friendly platform where users can learn about different battery types through detailed explanations that include their pros and cons, real-life applications, and examples of sample EVs that utilize them. Additionally, users can compare key features of each battery using filtering options. The website is easy to navigate and is accessible on both desktop and mobile devices.

2. Objectives

- Create a responsive website using HTML, CSS, and JavaScript.
- Implement a carousel interface using [Swiper.js](#) to display battery cards.
- Enable sidebar filtering options for desktop users.
- Ensure mobile design with responsive navigation, toggles, and optimized visuals.
- Collect user feedback/messages via a contact form using Formspree

3. Software Tools

- HTML5 - Markup structure for pages
- CSS3 - Styling, layout design, animations
- JavaScript (ES6) - Mobile navigation toggle
- [Swiper.js](#) - Slider feature for battery card display
- Font Awesome - Icons for navigation bar
- Formspree - Collect user messages via contact form
- VS Code - Code editor used throughout development

4. Features Implemented Successfully

Navigation bar: A fixed, gradient-themed top bar with page titles and hamburger toggle mobile view.

Swiper Carousel: Implemented for battery card display. Works smoothly on both desktop and mobile.

Responsive design: Layout adapts across various screen sizes using media queries.

Battery Cards: Each battery card displays image, name, and description. Cards are styled with shadows, border-radius, and spacing.

Mobile Optimization: Hamburger toggle menu and responsive Swiper slider are fully functional on mobile devices.

Font Awesome Icons: Used for visual feedback and buttons.

Formspree Integration: A contact form was implemented to collect user messages. The form connects to Formspree's endpoint to send email notifications.

Internal Anchor Navigation ("About" section): Users can click on one of the contents, and the page smoothly scrolls to the corresponding content using anchor links.

Filtering Functionality: Implemented a dynamic JavaScript-based filtering system that allows users to refine battery cards by multiple features (text search, life-span, energy and power density, price range)

5. Challenges

Styling for mobile devices was challenging due to limited screen space and layout constraints. On the desktop, filter options are displayed horizontally, however, this layout didn't work well on smaller screens. To solve this, I create a toggle-based filter panel that hides the options by default and reveals them when the user clicks the "Filter" button.

6. Future work

Initially, I planned to use MongoDB to store and load battery data dynamically, but due to integration issues, I simplified the setup using static HTML and JavaScript. In the future, I aim to revisit this and implement full MongoDB backend integration for real-time data management.

7. Conclusion

The EV Battery Explorer projects show important web development skills like responsive design, user interaction, and dynamic features. It provides a clean, mobile-friendly space where users can check out battery types, use advanced filters, and easily navigate detailed sections. Using Formspree allowed me to collect user feedback without needing a backend.

Throughout this project and the course, I gained practical experience in writing HTML and CSS, creating responsive layouts, using JavaScript functions, and using third-party libraries like [Swiper.js](#) and Formspree. I also learned to design an user-friendly interface, manage layout problems across different screen sizes and think carefully about the user experience.

Although I originally planned to use MongoDB for handling dynamic data, technical problems led me to simplify the site with static content. In the future, I want to fully integrate a database for real-time data updates and better search options. Overall, this project reflects the skills and design approach I developed during the course and has given me the confidence to create more complex, user-centered web applications in the future.