

Solar Car Challenge

Website Update and Improvement



Background

The Solar Car Challenge is the top project-based STEM Initiative helping motivate students in Science, Engineering, and Alternative Energy. The Solar Car Challenge Education Program met this objective. It worked to provide hands-on workshops, virtual learning videos, curriculum materials, and on-site visits for high schools across the country. The product of each two-year education cycle is the Solar Car Challenge: a closed-track event at the world-famous Texas Motor Speedway, or a cross-country race designed to allow students to display and drive their solar cars. The Solar Car Challenge is recognized by the IRS as a 501(c)(3) non-profit education foundation.

Team size: 4-5 Students

Location: Remote, client/team meetings will be held with Zoom.

Problem Description

The Solar Car Challenge seeks to update and modernize its website, solarcarchallenge.org, which is currently built using pure HTML. Modernization is necessary to improve user experience, enhance functionality, and ensure scalability for future growth. The primary objective of this project is to migrate the existing content and features to a contemporary JavaScript-based framework such as React or Next.js. The updated website will incorporate the following improvements:

- **Fully Mobile-Responsive Design:** Ensuring optimal viewing and usability across all devices, including smartphones and tablets.
- **Low Operating Costs:** Utilizing efficient coding practices and technologies to keep ongoing maintenance and hosting expenses minimal.
- **Student Accounts and Login Functionality:** Allowing students to create accounts, log in securely, and access personalized content.
- **Web Interface for Page Editing:** Providing an easy-to-use content management system (CMS) for authorized users to edit certain pages without needing technical knowledge.
- **High-Quality Code and Documentation:** Developing clean, maintainable code and comprehensive documentation to facilitate future updates and maintenance.
- **Enhanced Image Browsing Experience:** Implement dynamic, visually appealing galleries with interactive lightbox features, thumbnail navigation, image categorization, lazy loading for performance, mobile-friendly design, zoom and pan functionality, captions and metadata display, slideshow options, and social media integration.

Additional features and benefits of the new website include:

- **Enhanced Navigation and Usability:** Streamlined menus and a more intuitive layout to improve user experience.
- **Interactive Elements:** Integration of features such as event calendars, multimedia galleries, and forums to increase engagement.
- **Performance and Security Improvements:** Leveraging modern web technologies to ensure faster load times and better security.

The project will follow a structured deployment strategy, including thorough testing phases to ensure a seamless transition. The goal is to deploy the revamped website to production by the end of the calendar year, providing a significantly improved platform for all users.

Desired Skills

While we are open to students learning new technologies, familiarity with the following would be beneficial:

- Web-Based App Development
- Familiarity with Cloudflare, Tailwind CSS, React
- UI/UX Design
- Git and CI workflows

Ownership of Intellectual Property

Students working on this project need to assign ownership of the intellectual property to the Solar Car Challenge Foundation