MICHIGAN STATE UNIVERSITY

Project Plan Presentation

Optimizing Electric Motors Using ML

The Capstone Experience

Team Anthropocene Institute

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From Students…
…to Professionals

Project Sponsor Overview

- Firm based in Palo Alto, exploring solutions for Climate Change
- Connecting investors, policy makers and researchers
- Assess research project claims, maturity and viability

Anthropocene Institute

Project Functional Specifications

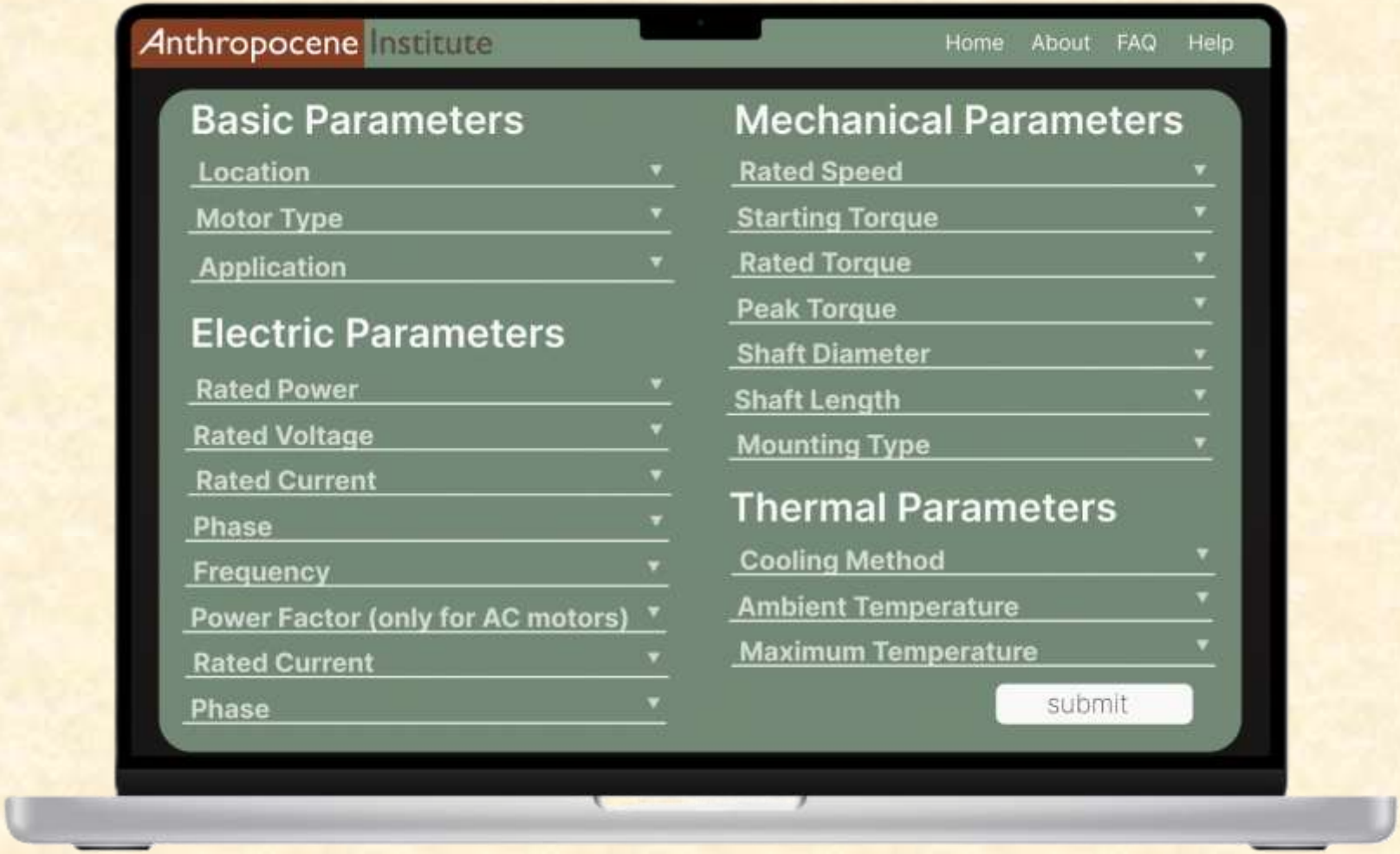
- Motors are one of the most widely used electronic products
- Reducing the environmental impact of motors
- ML model to find optimal motor design
- Model is tied to web app for ease of use

Project Design Specifications

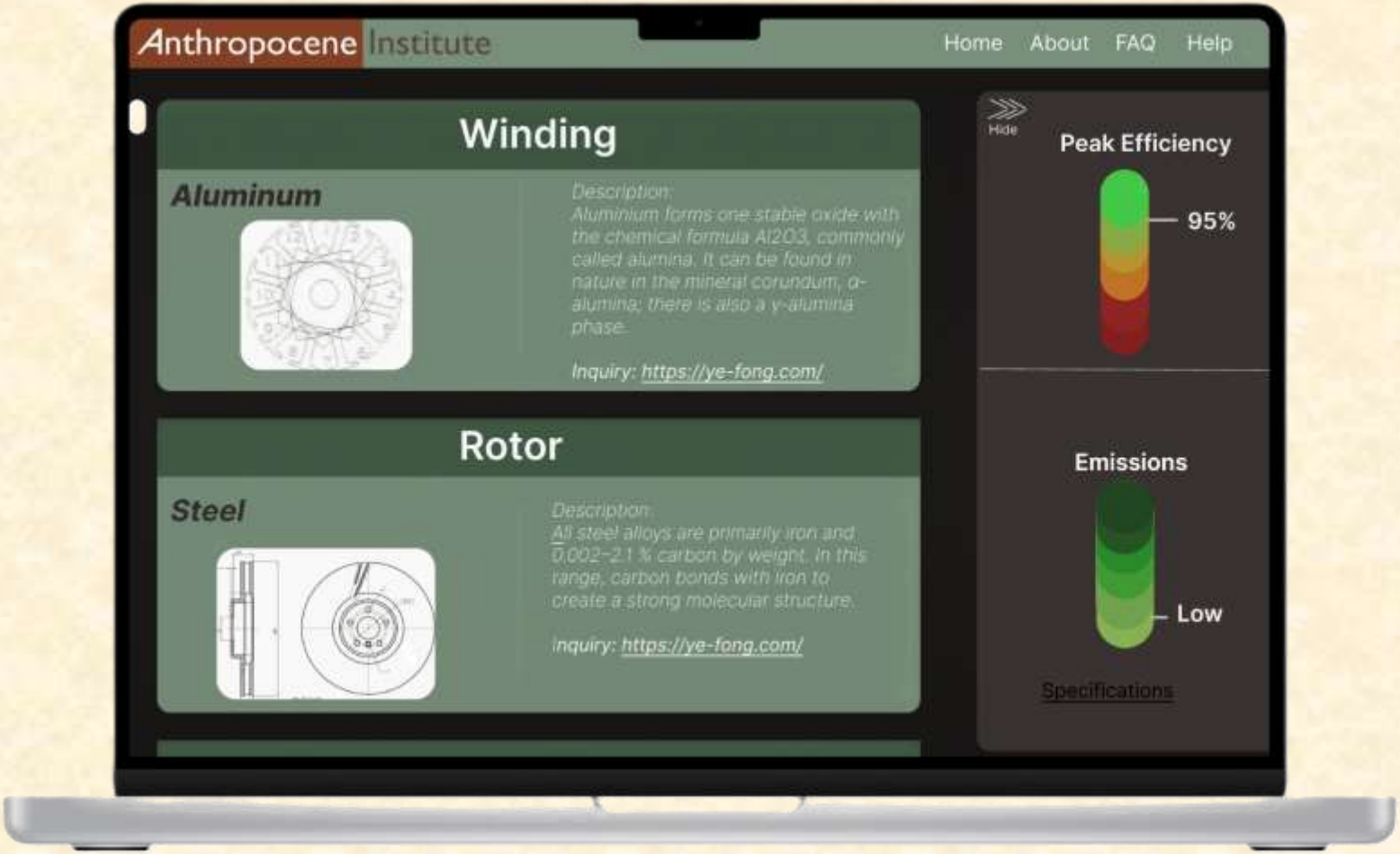
- Interactive Web application for project managers, engineers, and researchers
- Allows users to create a parameterized electric motor based on user input
- Outlines materials used for each motor component
- Provides an efficiency, carbon emission, and performance analysis

Screen Mockup: Homepage

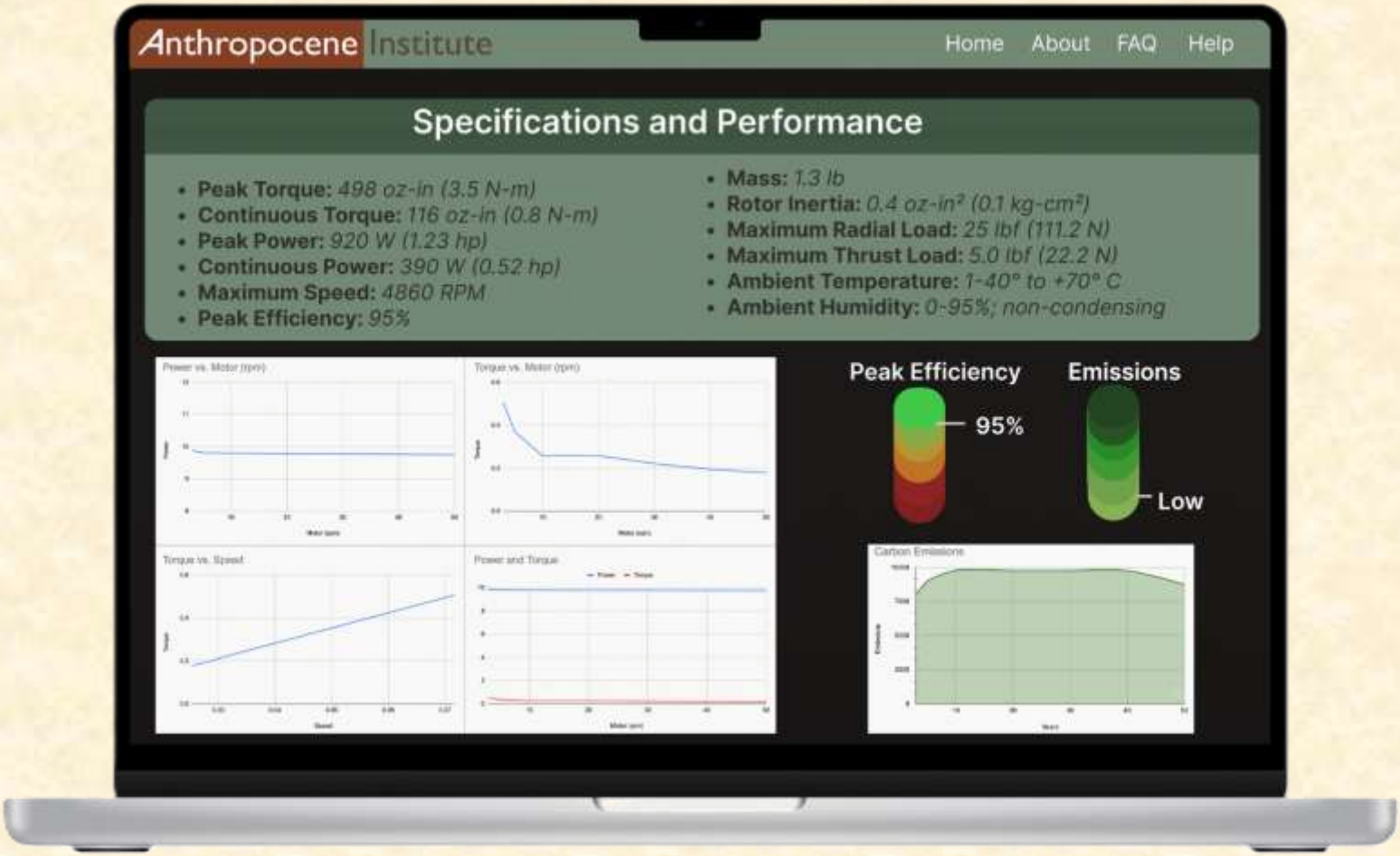
Screen Mockup: Motor Parameter Page



Screen Mockup: Materials Page



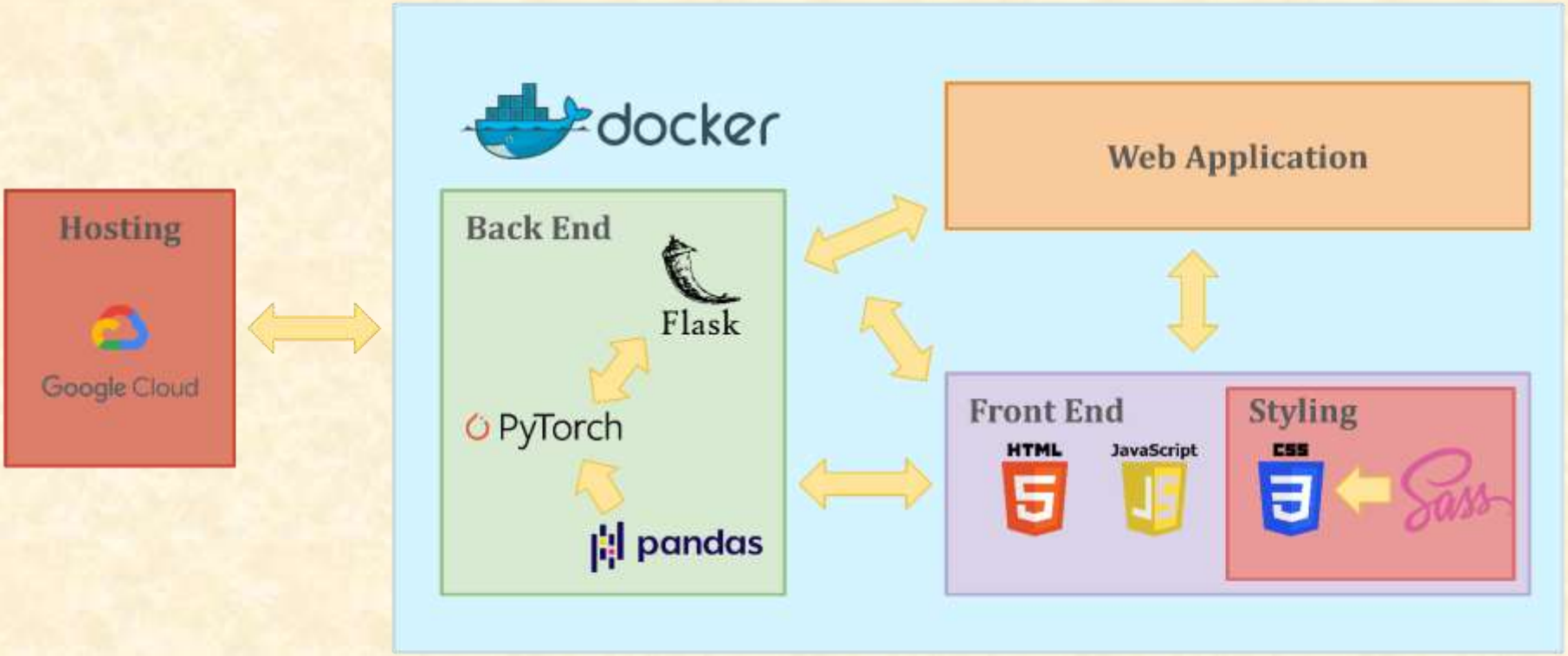
Screen Mockup: Performance Analysis



Project Technical Specifications

- Flask Website
- Python (PyTorch, Sklearn, Pandas)
- Docker
- HTML, Javascript and CSS with Sass preprocessor

Project System Architecture



Project System Components

- Hardware Platforms
  - Google Cloud
  - Virtual Ubuntu Based Server
- Software Platforms / Technologies
  - Flask – Python Based Web Framework
  - Docker – OS virtualization and containerizing
  - PyTorch – ML Model creation, training and testing
  - ScikitLearn – Prepare test and train data

Project Risks

- Risk 1
  - Figuring out what ML architecture to use
  - Test out different configurations on data
- Risk 2
  - Defining motor quality
  - Speaking to sponsor about needs and use-case
- Risk 3
  - Limited access to motor databases
  - Contacting sponsors and requesting data

Questions?