Product Portfolio.

by Kian Raissian

About

Mechanical Engineer
BS, Olin College of Engineering
Class of 2020

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About Me

Kian Raissian

I am a mechanical engineer with experience in climate technology, heavy industry, vehicle engineering, and aerospace. I am passionate about creating user centric engineering solutions with high impact.

My journey in user centric engineering design began during my time at Olin College. The curriculum initially instilled the importance of user oriented design through design coursework, which led me to choose to partner with Toyota Mobility Solutions for my senior capstone design project.

I continue to be propelled by this passion as I interact with different customers, clients, stakeholders, and teams within the framework of my engineering practice.

Outside of my career, I enjoy cycling, cooking, and playing the cello.

A Powered Wheelchair for the Digital Age

For More Details ↗

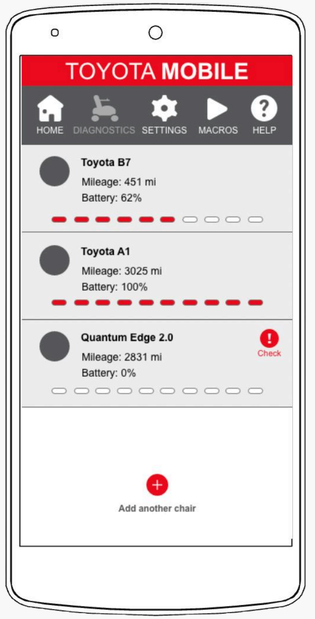
10.2019-05.2020

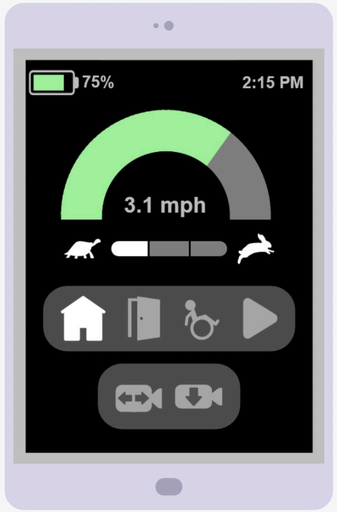
CLIENT
Toyota Mobility Solutions

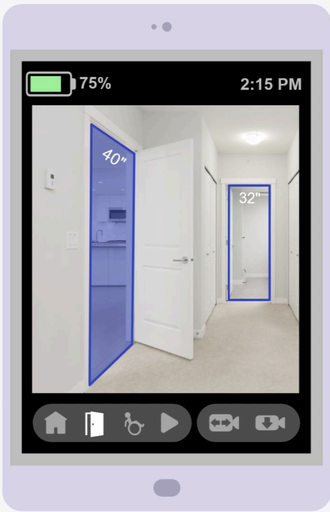
PROBLEM
Toyota wanted to design a new powered wheelchair that matched the maturity of today's integrated technology and solved problems users had with their current wheelchairs.

SOLUTION
My team and I conducted extensive research through existing surveys, data, and our own interviews with powered wheelchair users to design a new control module that was more sleek, robust, and adaptive to meet the broad demographic this community represents. I led the mechanical design of the armrest module, and along with my team, created a new digital interface for the module's screen, along with an accompanying smartphone app to allow for more capability.

SKILLS
Mechanical Design, Graphic Design, UI/UX Design, User Interviews, Market Research, User Centric Design, Project Management







Structural Capability for Self Driving Trucks

11.2025-02.2026

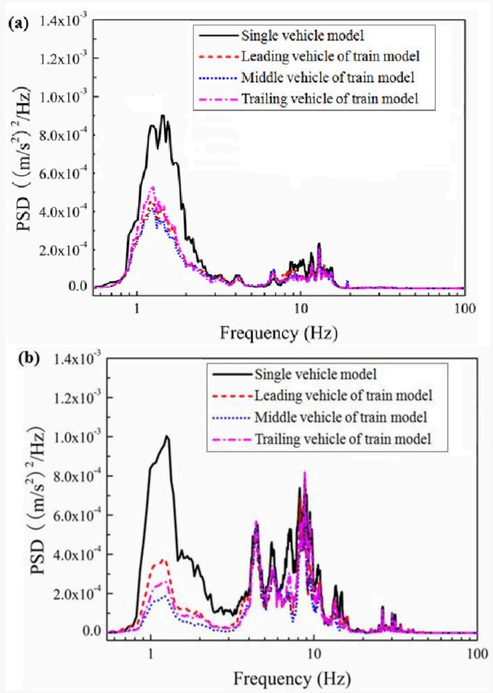
For More Details ↗

CLIENT
Gatik AI

PROBLEM
Gatik needed a structural design standard, as the previous design strategy was based on conservative industry standards, and parts were designed to last infinite life. This combination of factors meant that the hardware was overdesigned, but there wasn't a current plan to determine more relevant loads, accumulated damage during operation, and expected lifetime.

SOLUTION
After creating a test plan and measuring loads by placing accelerometers in key places on the autonomous vehicle's sensor structure, I wrote a script in Python to parse the data and return key values and graphs including max and median loads, and a power spectral density curve to act as a test standard. I also wrote a script for a separate test that gathered strain gauge load data and calculated accumulated damage using a half cycle Rainflow Counting algorithm.

SKILLS
Python, Structural Analysis, Data Processing and Analysis



Note: Images are examples of graphs and sensor setup, actual graphs and accelerometer configuration are propriety to Gatik
Graph from research paper here, car photo courtesy of The Modal Shop

Case Study: Induction Stove Accessory

10.2025-10.2025

For More Details ↗

CLIENT
Myself

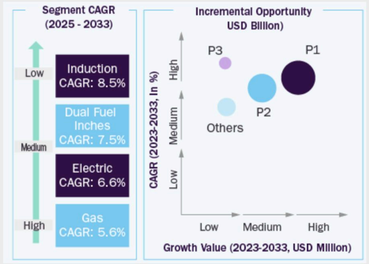
PROBLEM
To grow my product insight skills, I chose to create a pitch for a company and product that I am somewhat familiar with and excited by. I chose Copper's Charlie Induction stove. Cooking is a passion of mine and I have tested almost every type of stove available, so I felt confident pitching a feature that would solve a problem or emphasize a joy that others found with induction stoves.

SOLUTION
I chose to pitch a food thermometer that paired with the stove to keep contents at a desired temperature. It harnessed the power of Copper's existing IoT infrastructure, induction technology's ability to keep steady temperatures, and catered to serious home cooks and professional chefs that might be skeptical about the adoption from gas to induction stoves.

SKILLS
Product Insights, Market Research and Analysis, GTM Strategy

Opportunity Space

- 70% of Americans wants an induction range, but only 3% actually purchase[1]
- Induction range market and adoption rate is trending rapidly upwards, with highest CAGR of all range types[2]
- Inflation Reduction Act has rebate for induction stove, and many states are introducing additional subsidies for clean energy technologies



Sources:
1. Data
2. Data

TONKA: A Zero Emissions Mining Truck

For More Details ↗

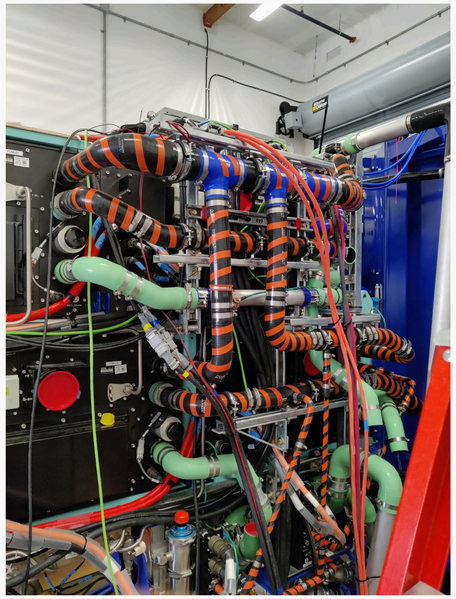
01.2021-02.2022

CLIENT
Anglo American

PROBLEM
Anglo American, a large mining company, was a client of First Mode when I joined in 2021. They wanted to extend the lifetime of their available vehicles by retrofitting decommissioned trucks with a fuel cell and battery powertrain system.

SOLUTION
The team fitted 750 kW of fuel cells, 1250 kW of batteries, and large hydrogen storage tank onto a Komatsu 930E-4 mining truck at a platinum mine in Mogolakwena, South Africa. I designed the fuel cell's coolant, air exhaust, and hydrogen delivery system. Additionally, I travelled to the mine in South Africa to act as the integration liaison. I spent time with the mine team fielding questions and concerns to help inform design decisions on the future trucks.

SKILLS
Mechanical Design and Analysis, Vendor Management, Fluids Design and Analysis, Systems Design, Packaging, Assembly and Integration, Project Management



RETRO: An Improved Retrofit of a Mining Truck

06.2022-01.2024

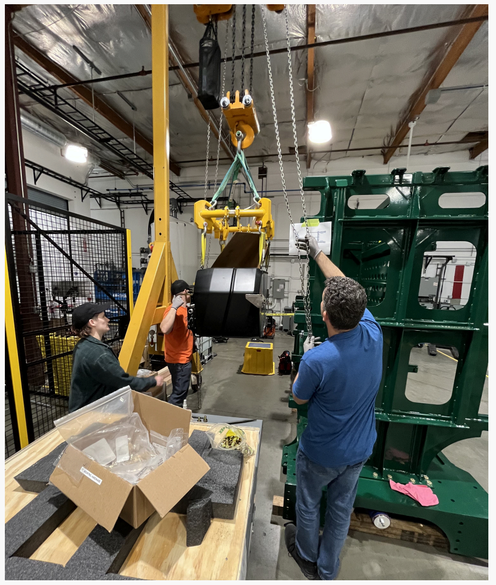
For More Details ↗

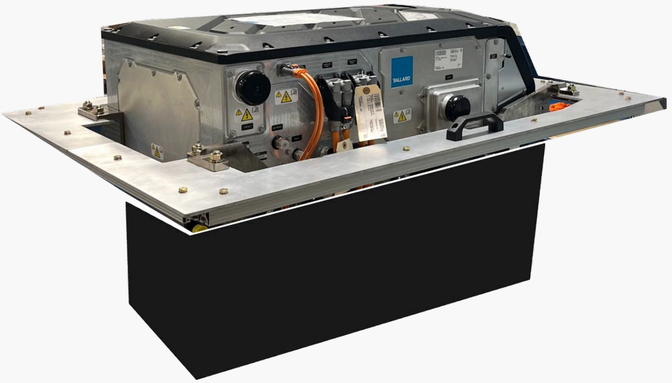
CLIENT
Anglo American

PROBLEM
After a successful proof of concept with TONKA, Anglo American wanted to continue their relationship with us, allowing us to improve on our past design.

SOLUTION
This retrofit consisted of 1100 kW of fuel cells and 900 kW of batteries. I took what I learned from our previous retrofit across all the teams I interacted with to start a new design. I choose a new fuel cell and architecture, designed the mounting solution for the fuel cells, and created an assembly and integration plan that would allow the system to come together in a tight manufacturing timeline. I also worked cross functionally with different engineering teams, acting as a liaison to communicate requirements and design status.

SKILLS
Mechanical Design and Analysis, Vendor Management, Structural Finite Element Modeling, Systems Design, Vehicle Architecture, Assembly and Integration, Project Management





OEM MK2-MK5 Electric Formula Vehicle Design

10.2016-05.2020

For More Details ↗

CLIENT
Olin Electric Motorsports/Olin College

PROBLEM
My project team in college was responsible for designing and building an electric formula style race vehicle to participate in annual races.

SOLUTION
The team designed and built a race vehicle every year that had to pass race inspections and compete in events to test our vehicle's capabilities. Over the four years I was a part of the team, I designed and manufactured our exterior body panels for 3 of our vehicles from fiberglass and carbon fiber, and spent my last year on the team designing an aerodynamics system, along with building a framework for the team to continue learning about composites and aerodynamics in race cars.

SKILLS
Mechanical Design and Analysis, Composites Design and Fabrication, CFD, Assembly and Integration, Vendor Management