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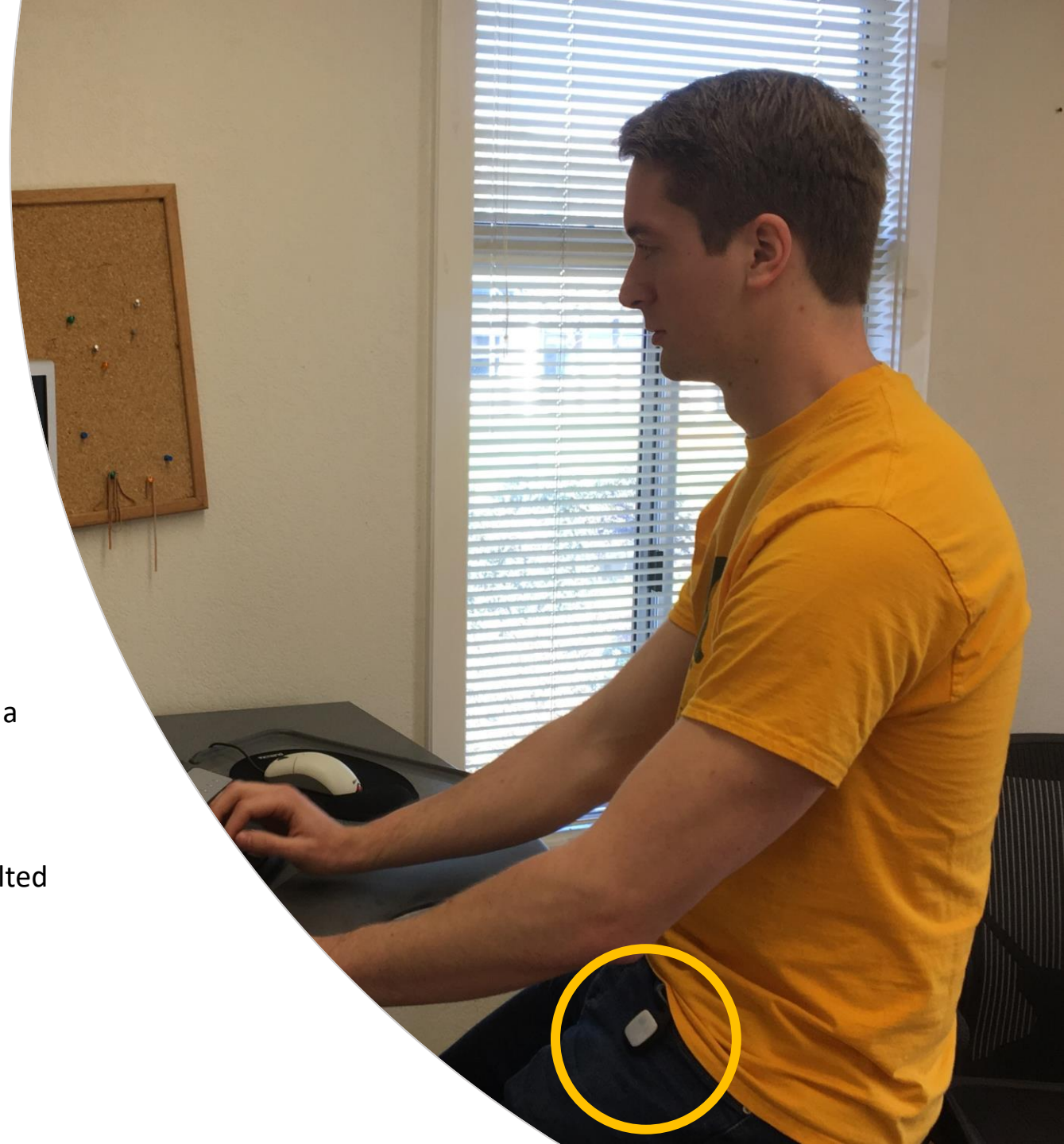
Prototyping:
UC Berkeley / UC San Francisco Ergonomics Program

Background -

I joined the UC Berkeley / UC San Francisco Ergonomics Program as a research intern on the ActiveTrack project.

The laboratory plays a major role in the fields of public health and ergonomics. Companies such as Microsoft and Logitech have consulted with the laboratory on the next generation of ergonomic devices.



Objectives -

The laboratory wanted to make a device that could detect different posture states as part of a multi-year study involving office workers. As they were not able to find a product suitable for their needs, the laboratory opted to build the device.

Role -

My job was product development as I developed and tested out the algorithms, hardware, and enclosures to create the device.

Daily, my work consisted of prototyping, testing, assembling, and monitoring the performance of the devices.

I also helped in the design process of the mobile companion app and instructional guides.

Ideation -

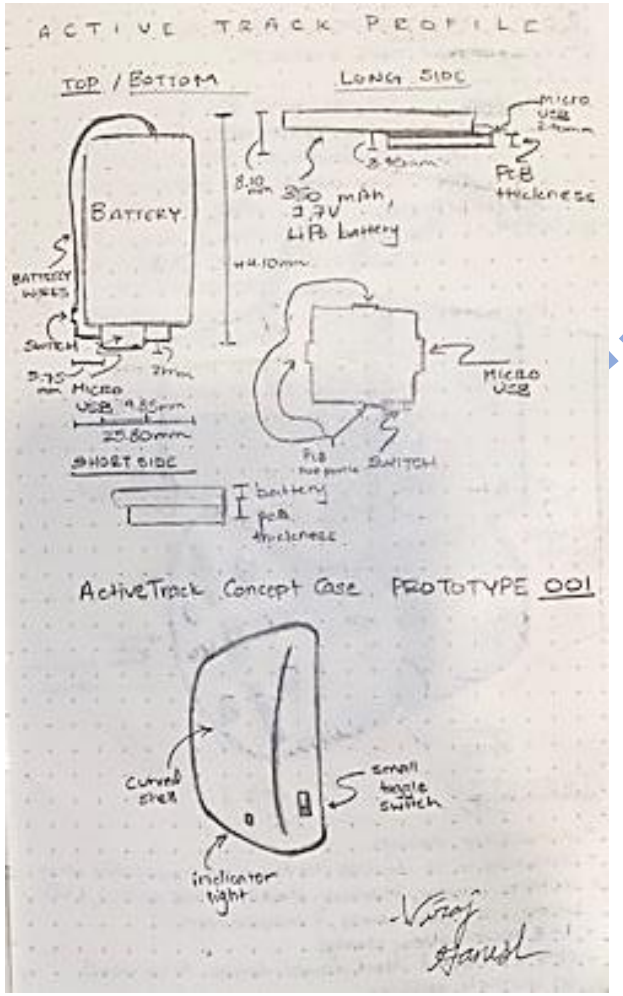
As a fan of Thinkpad, I wanted the device to look and feel durable and compact.

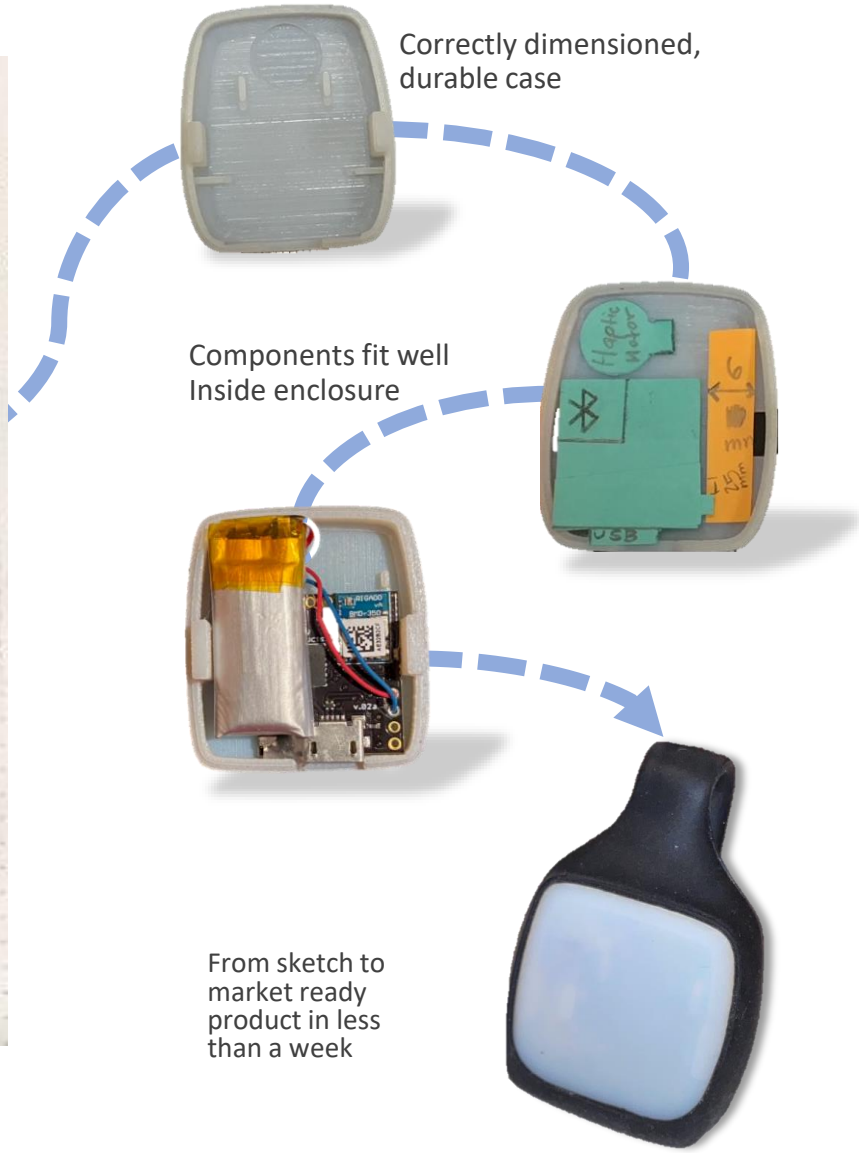
I went through 25 enclosure redesigns, 10 different battery sizes and power outputs, and 3 haptic motors changes before getting a device that could be used in the study.

Manufacturing -

Working with design specialists at the Jacobs Hall Makerspace, I learned how to use advanced 3D printing to make the enclosures. I spent weeks at Jacobs Hall cleaning, prepping, and testing prints until I had a high-quality enclosure.

Design sketch





Quality Control -

Besides manufacturing the devices, I also tested and debugged the algorithms. To control for variability in testing conditions, I built a robot arm which could expedite the testing process by having up to 10 devices run through a cycle of posture states over a 12-hour period.

Configuration as shown on the right allowed us to simulate walking.

Arm attachment shown to the left can hold up to ten devices at a time.

Outcome -

By the end of my internship, we built a market ready device capable of detecting different posture states and giving curated feedback to increase an office worker's physical activity throughout the day.

The highlight of working on this prototype was when one of my friends thought this product was made by Apple.

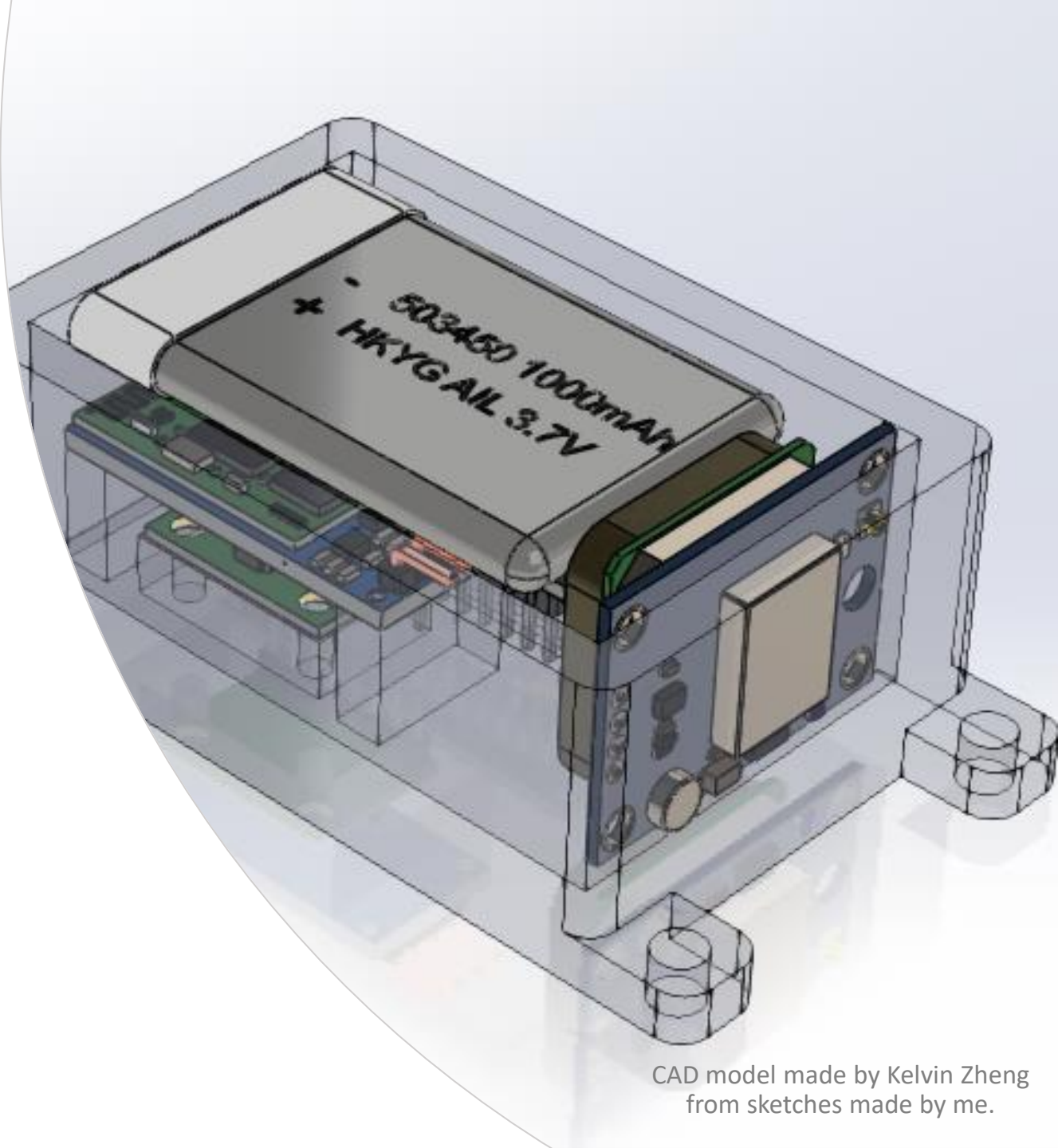
ActiveTrack device on model (one of the researchers at the laboratory).

Product Management: Motorcycle Crash Alert System

Background -

Motorcycle riding is dangerous. My co-founders and I have personally experienced and/or know people who were seriously injured or have died from a motorcycle accident.

Started out of ME 110 at UC Berkeley, our project became a full-time startup after we graduated. We are a part of Berkeley SkyDeck's Fall 2020 HotDesk Incubator Program.



CAD model made by Kelvin Zheng from sketches made by me.

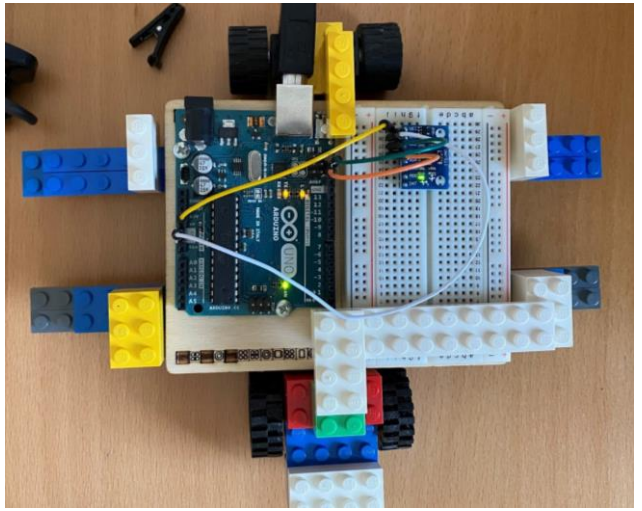
Objectives -

We wanted to create a device to sense and alert first responders of a motorcycle accident to lower the crash response time thus minimizing the chance of a permanent injury.

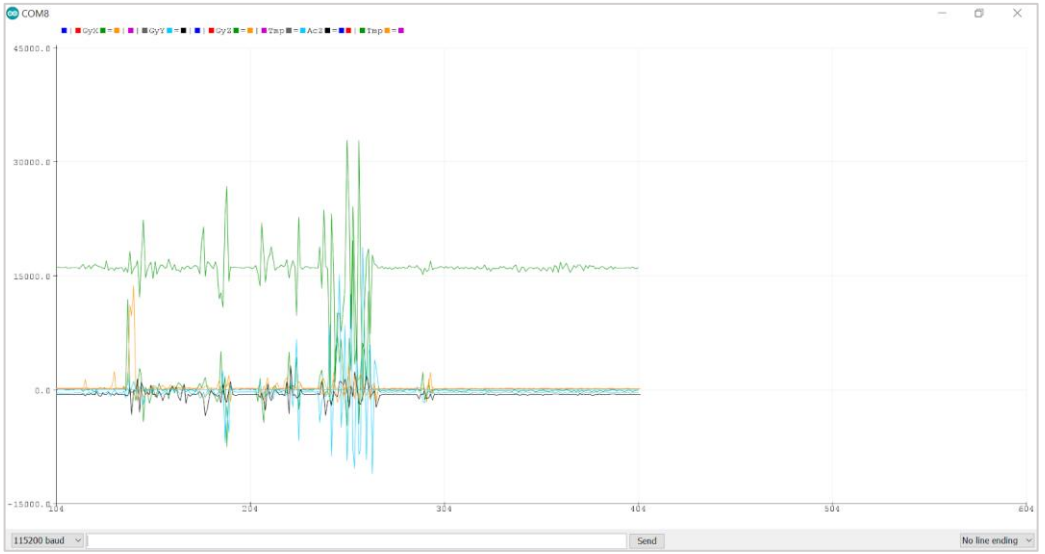
Role -

I am the Co-founder and Chief Executive Officer of the company. My duties include leading the product development of the device, working with lawyers on legal compliance, gathering user feedback, and developing the company’s business plan including funding requirements.

Early mockup of iOS app



Testing rig to test out the accelerometer and gyroscope sensor

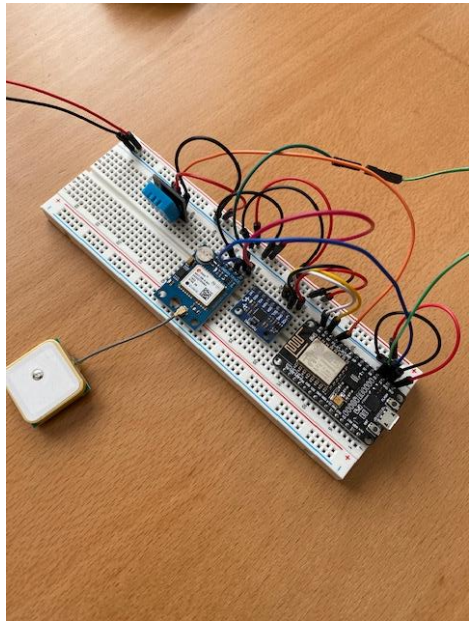


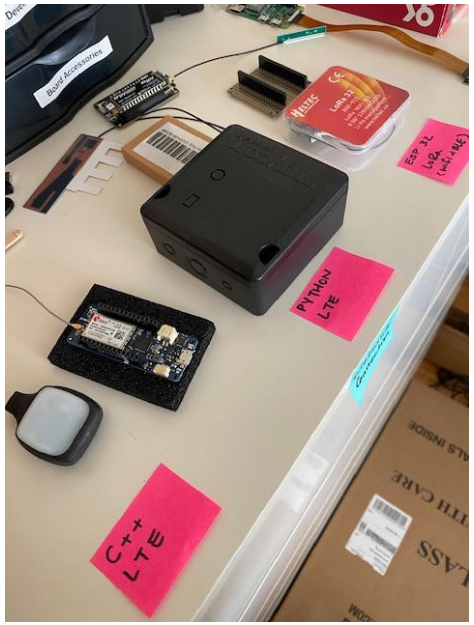
Graph showing a simulated low-impact crash

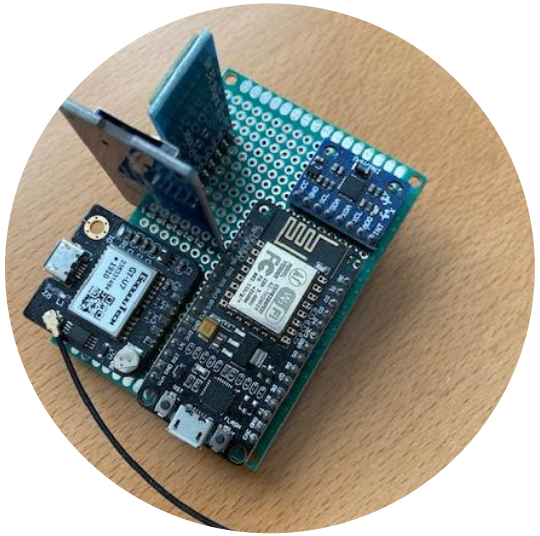
Hardware Prototyping -

Above all else, our product is meant to be 100% reliable no matter the condition. I ensured we met that goal by focusing on building a robust device.

I worked with network providers in the Long Range (LoRa) Wifi, SigFox, Long-Term Evolution (LTE), and 5G spaces to find the best network communication to send data while on the road.







Through building the device, I learned how to prototype the electrical components using breadboards and development boards.

Web Design -

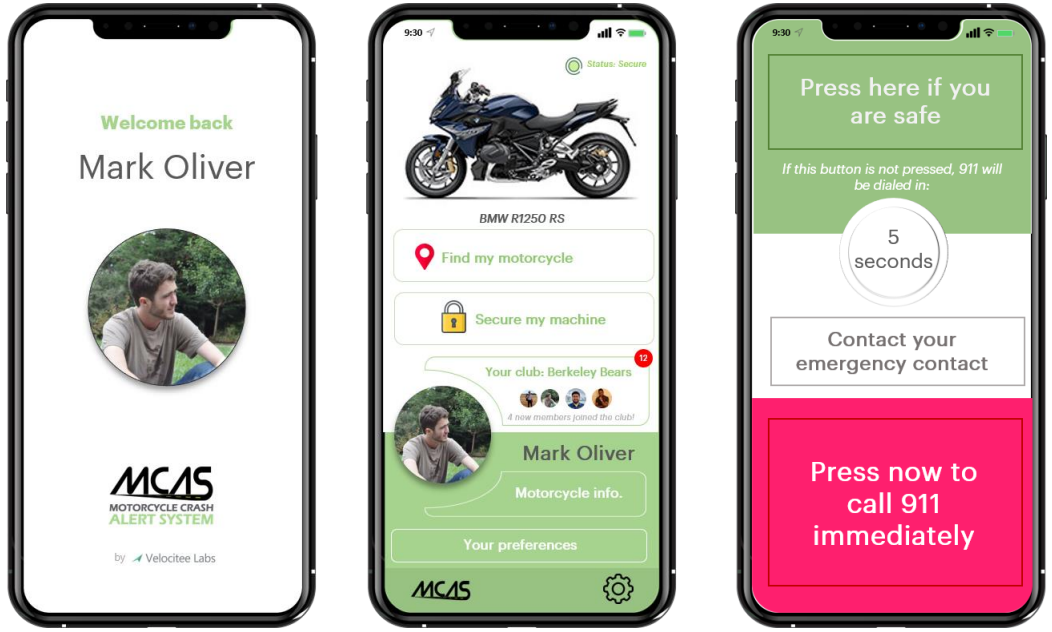
I also made mockups of the companion mobile application and created prototype web application as part of our minimum viable product.

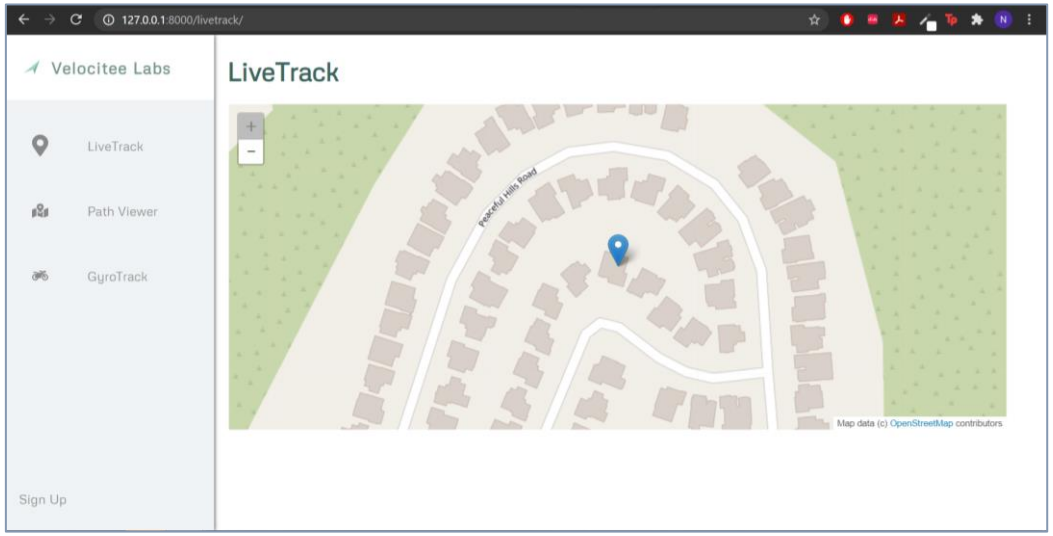
Potential Customer Feedback -

I created a survey to understand the customer market landscape. Throughout the web design process, we had potential customers try the app out using Framer and conducted A/B testing to refine the layout of our application.

Outcome -

I learned how to use Django and Heroku to frame and host a web application. I refined my skills in Python and C++ from programming the devices. We are getting ready to beta test this device in 2021 and see if we can reach our goal of improving motorcycle safety





Graphic Design: UC Berkeley / UC San Francisco Ergonomics Program

Background -

As the program had grown in scope, the staff realized the lack of a logo was detrimental to the lab's brand name and recognition in the field of ergonomics.

Objectives -

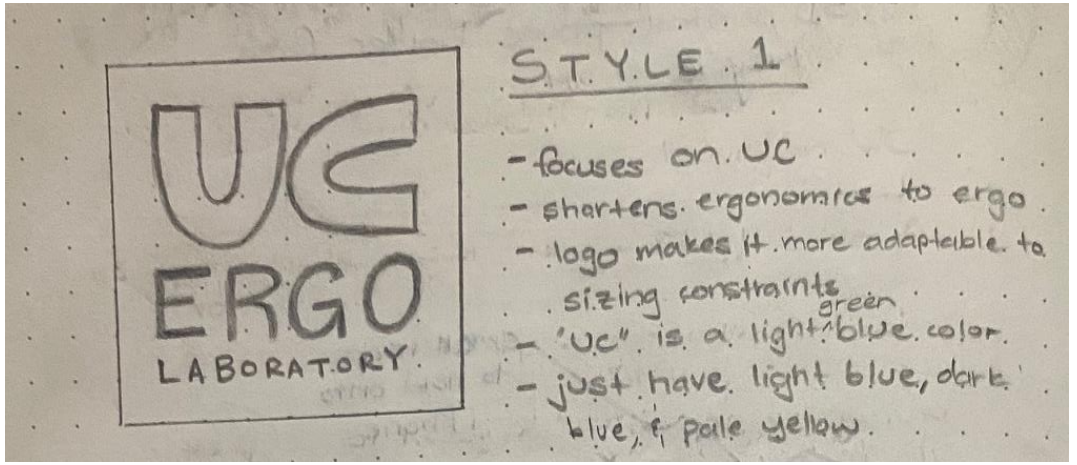
Considering the long laboratory name, I wanted to create a compact logo that would easily fit on any publication, research paper, and/or promotional material.

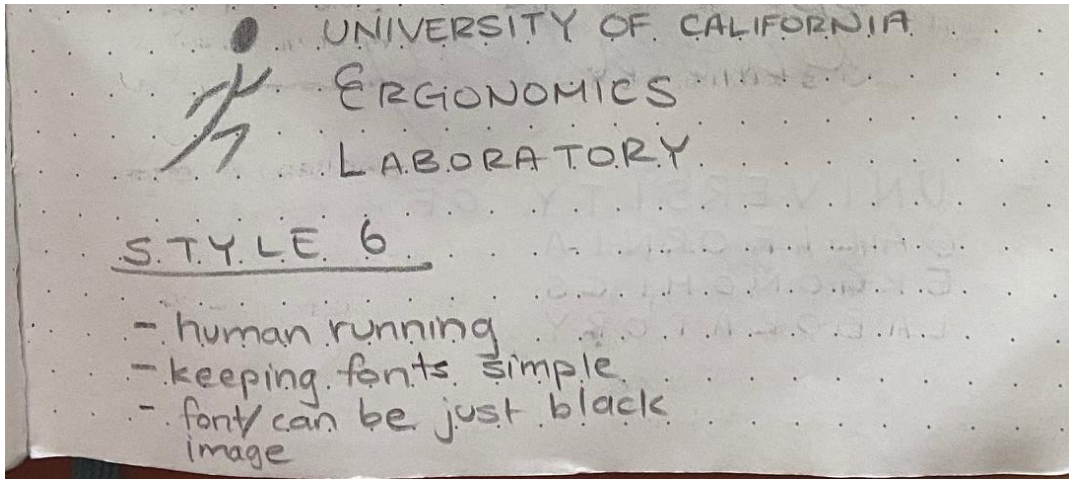
Taking inspiration of Apple's logo, the lab should have an icon that represents its work.

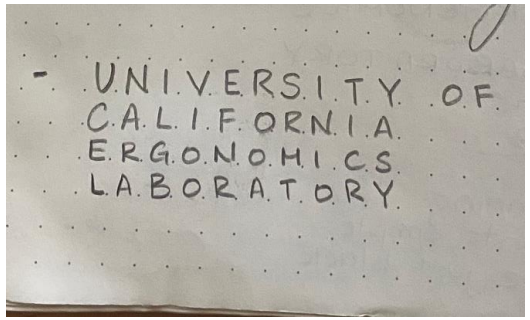
Role -

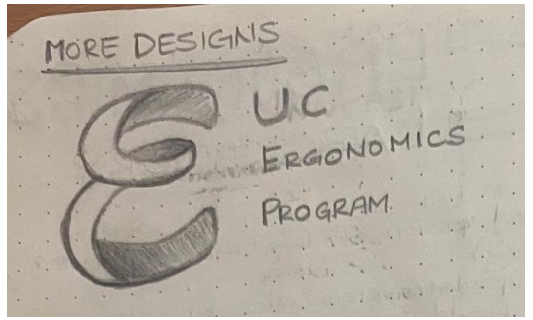
As the primary designer for this project, I oversaw the entire iterative design process as well as gather feedback from key stakeholders.

I had meetings with other graphic and web designers to ensure that the logo was up to industry standards and compliant with the Web Content Accessibility Guidelines (WCAG).









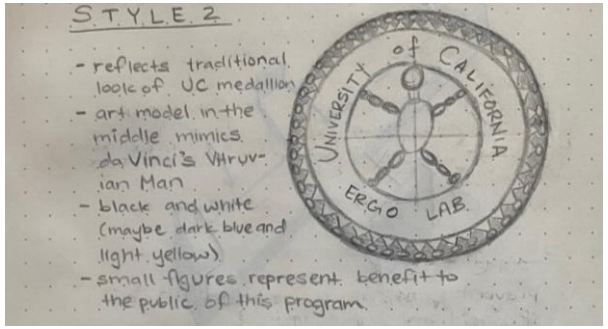
Sketching -

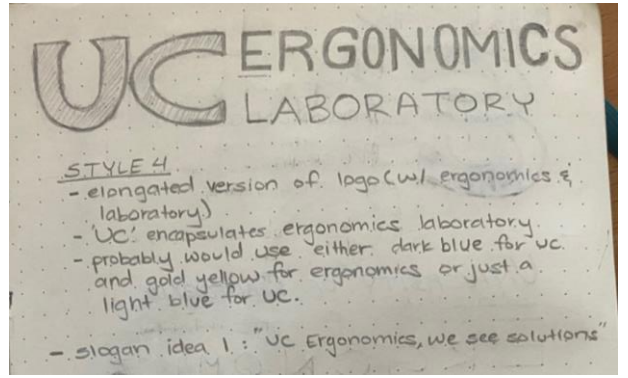
With the Director's permission, I began a total revamp of the laboratory's brand scheme. I developed of a new website for the laboratory in addition to creating a logo.

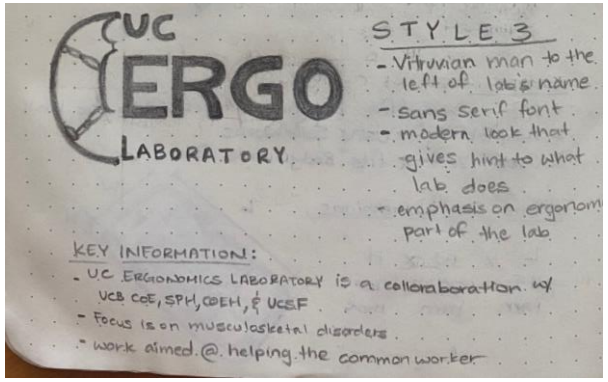
Using what I learned in Design Innovation 21, I sketched out a few designs. Each one emphasized different words of the lab's title as well as included some design elements such as the Vitruvian man.

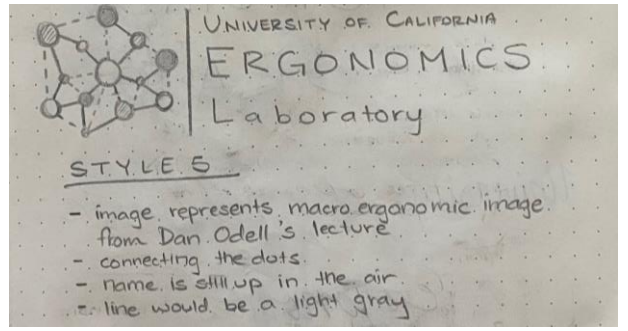
Process -

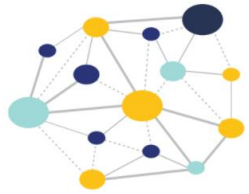
After colorizing the logos, I got input from the director, the laboratory's staff, and the research interns. Their insight helped to narrow down the logo to the active walking person.









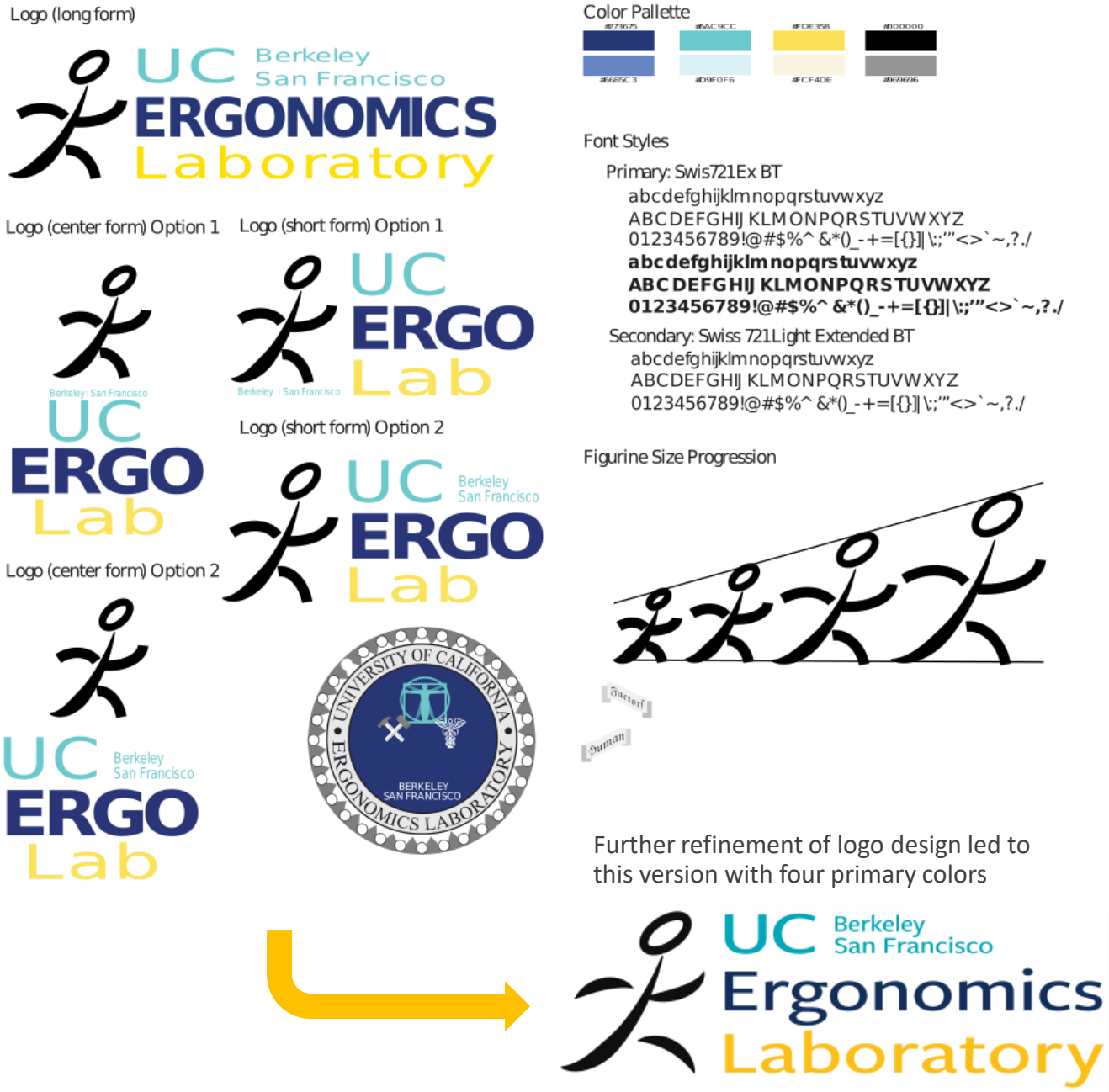


Feedback -

The additional feedback gave me direction in on where to refine the logo. To simplify the colorization and potential modification of the logo, I created a breakdown chart of the different iterations of the active walking person, the colors used, and the scaling of the figurine.

Learning from others -

Talking with graphic designers and web designers, I made sure the logo could be easily used in print and on websites. After one final round of input, we changed the gait of figurine, adjusted the arms and legs to give the impression of running, and reduced the primary colors down to two, blue and yellow.



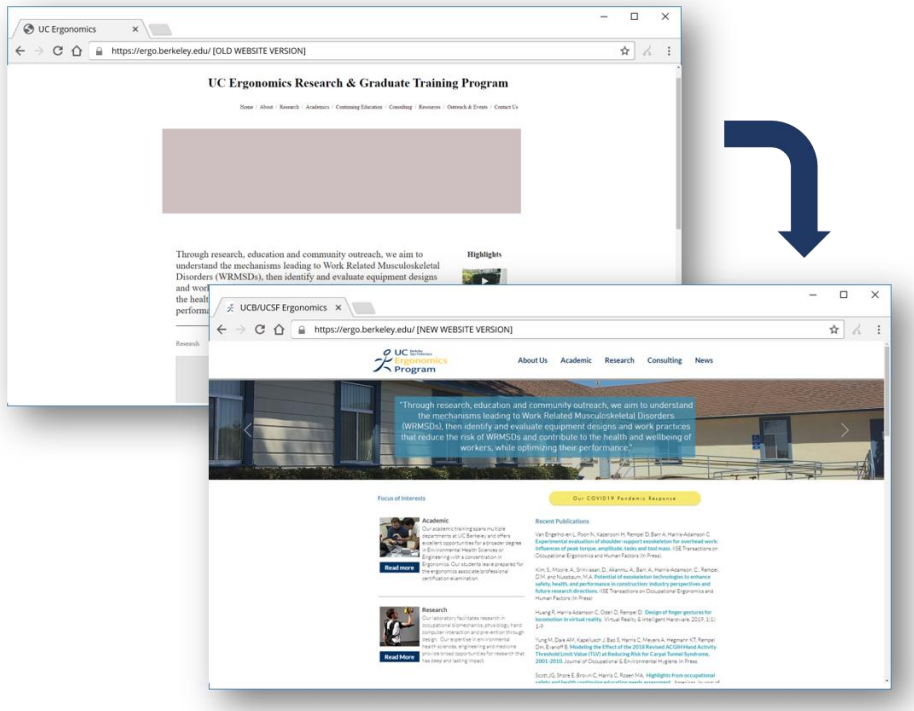
Outcome -

After its release, the logo has used on all the laboratory's papers, promotional material, and website. Having a consistent brand identity also helped me when I redesigned the lab's website.

Through this experience I got to learn how to use Adobe Illustrator, create favicons, and understand color codes standard like Hex and HSL. Additionally, this experience gave me the confidence to make more logos during my college career.

UC Berkeley San Francisco
Ergonomics
Program

Old Website



New Website

Velocitee Labs

MCAS
MOTORCYCLE CRASH
ALERT SYSTEM

ENGINEERING
STUDENT
COUNCIL

Project Management: Free Menstrual Product Initiative

Background -

I was elected as the Engineering Student Council President during my time at Berkeley. As part of my initial goals, I wanted to create an Equity and Inclusion Committee. While creating this committee, I thought of the idea of providing free menstrual products as a potential initial project.

After vetting this idea with the E&I committee as well as with my engineering peers, I kickstarted the month-long project to convert this idea to a full-fledged service.

Objective -

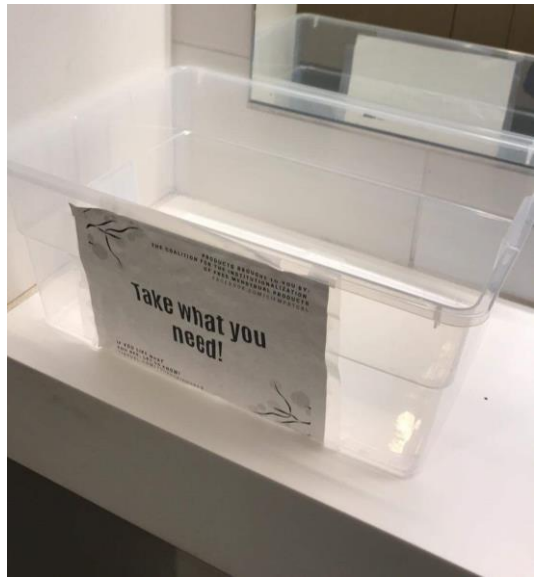
Seeing how menstruation has prevented my friends and colleagues from attending class and participating in career building activities, I wanted to create a reliable system that provided menstrual products to majority, if not all, gender-neutral and womxn –identifying restrooms.

Role -

As ESC President, I led the entire operation from developing the restocking system to the crowdfunding campaign to obtain funds to support the infrastructure costs. I reached out and negotiated an agreement with the Coalition for the Institutionalization of Free Menstrual Products to receive $40k worth of products over a 10-year timespan for free.

Process -

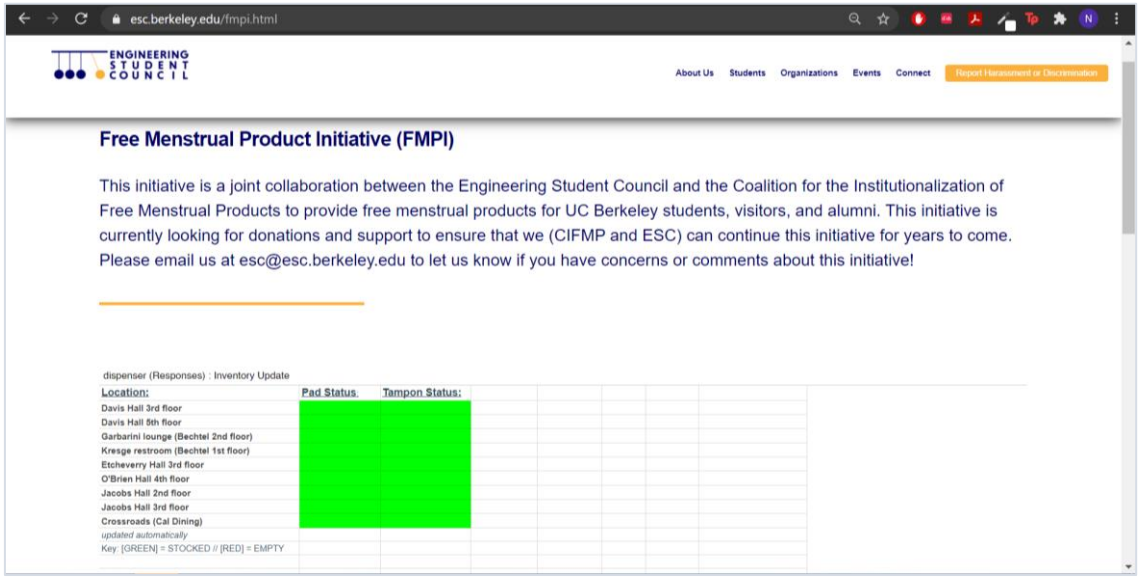
We gathered student input on offering a free menstrual product service and consolidated the opinions down to key features. I focused on the restocking efforts as that was a major problem of existing services on campus. Additionally, we raised over $1700 from our crowdfunding campaign to support the infrastructure costs.



I got help from the ESC's External Vice President's committee to gather photos on current solutions to distribute menstrual products around UC Berkeley.

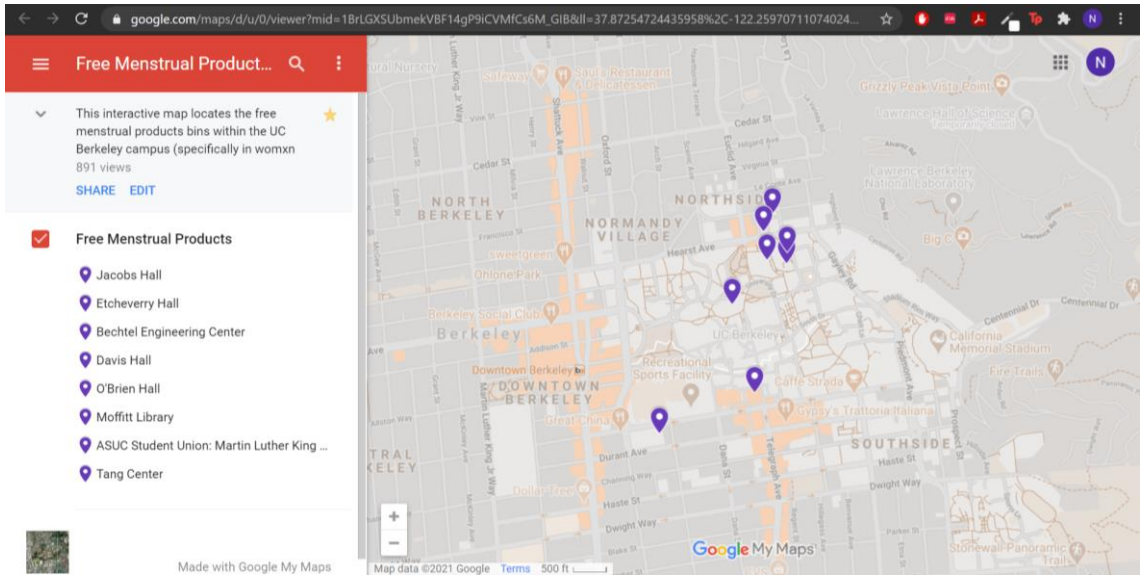
Coding a Web Application -

I coded a web application to streamline the restock process. As the ESC website was not set up to handle this, I restructured the entire website using HTML5, CSS, and JavaScript. Lastly, I created an interactive map using Google My Maps to help students find which locations offered free menstrual products.



Outcome -

By time the pandemic closed campus, 8 womxn-identifying restrooms had these products. We were on track to doubling that number by the end of March and have the entire College of Engineering covered by the end of the semester. Currently, efforts are being made to have this initiative become a part of the services provided by Berkeley Engineering.



Thank You

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