Problem Statement/Objective/Purpose

Creation of a taekwondo kicking target with automatically adjusting contact pad locations, with force feedback.

Use Case

The use case offers a customizable and versatile kicking target for various taekwondo needs

Business Case

The business case for this potential product would be providing a target that is not currently offered on the market. Many of the targets offering force feedback are inaccurate, and there is no target with app-controlled movements.

Notable Challenges

The most notable challenge was the app design portion of the project.

Key Specifications

- Each arm pad will have pad rotation about the vertical axis as well as vertical translation up and down the vertical axis.
- Force or acceleration data will be fed back to the user to view on a phone app interface.
- Accuracy of force or acceleration data must be interpreted within 5% of the actual value.
- Positioning of pads must be able to be stored into at least 30 different overall positions.
- Sustain forces from a skilled taekwondo practitioner, up to 6,400N (1439 lbf) of impact force per kick

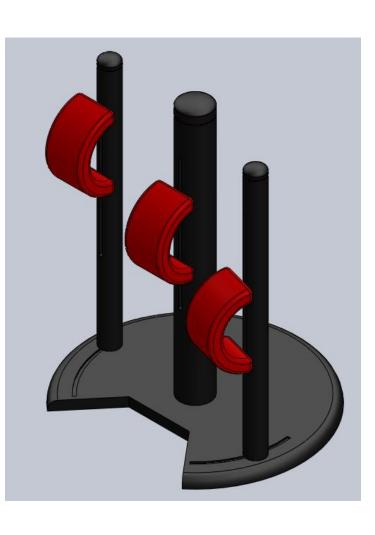
App Design

- The app will serve as the main control interface for the entirety of this project's functionality.
- The app will control all movements of the target, including vertical translation, rotational movement and locking.
- Additionally, the app will retrieve and display the force feedback.

Team 22: Taekwondo Kicking Target Blake Sanderson, Ali Mohamed, Liam Allen, Willow Biggs, and Sam Zebrowski

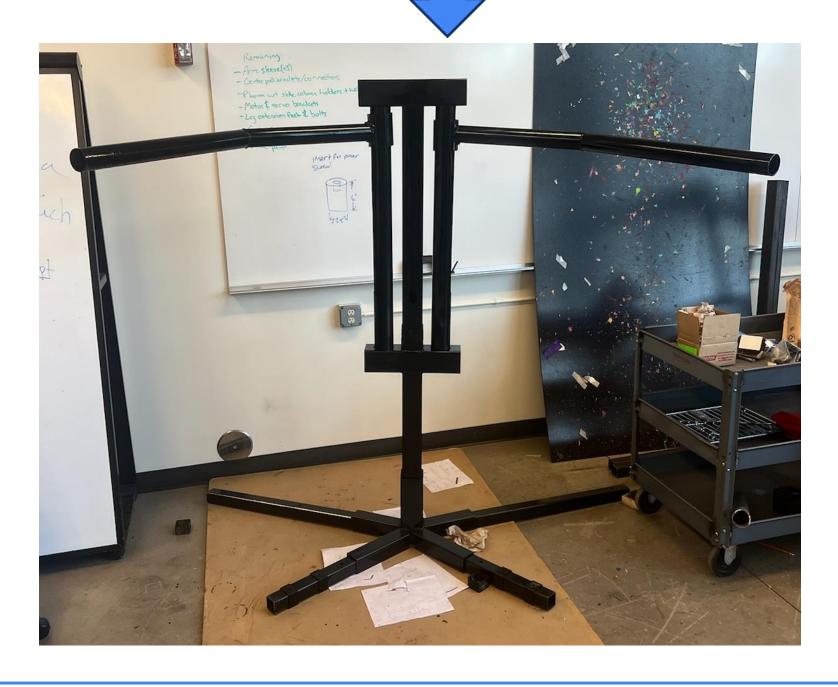
Concept Selection

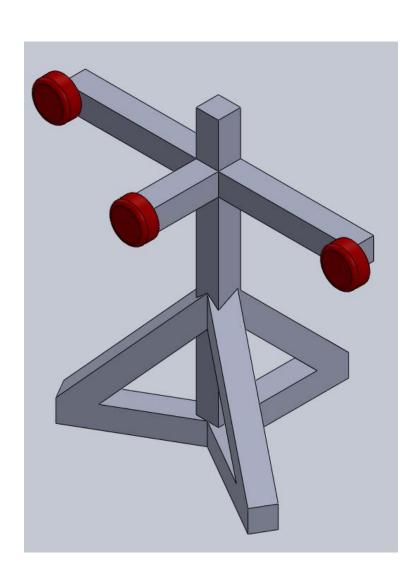


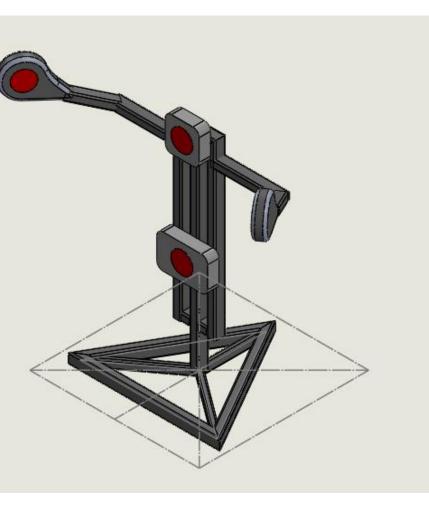


Build Progress







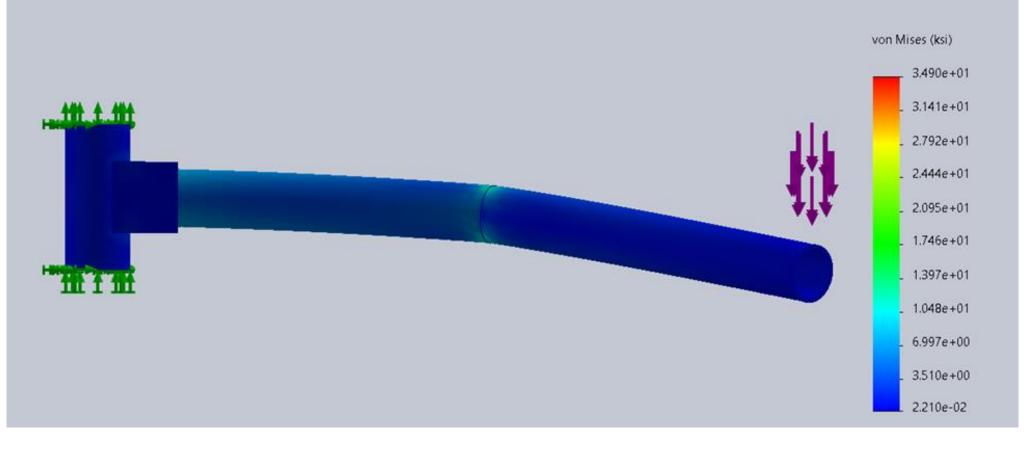




legs, at the ankle.

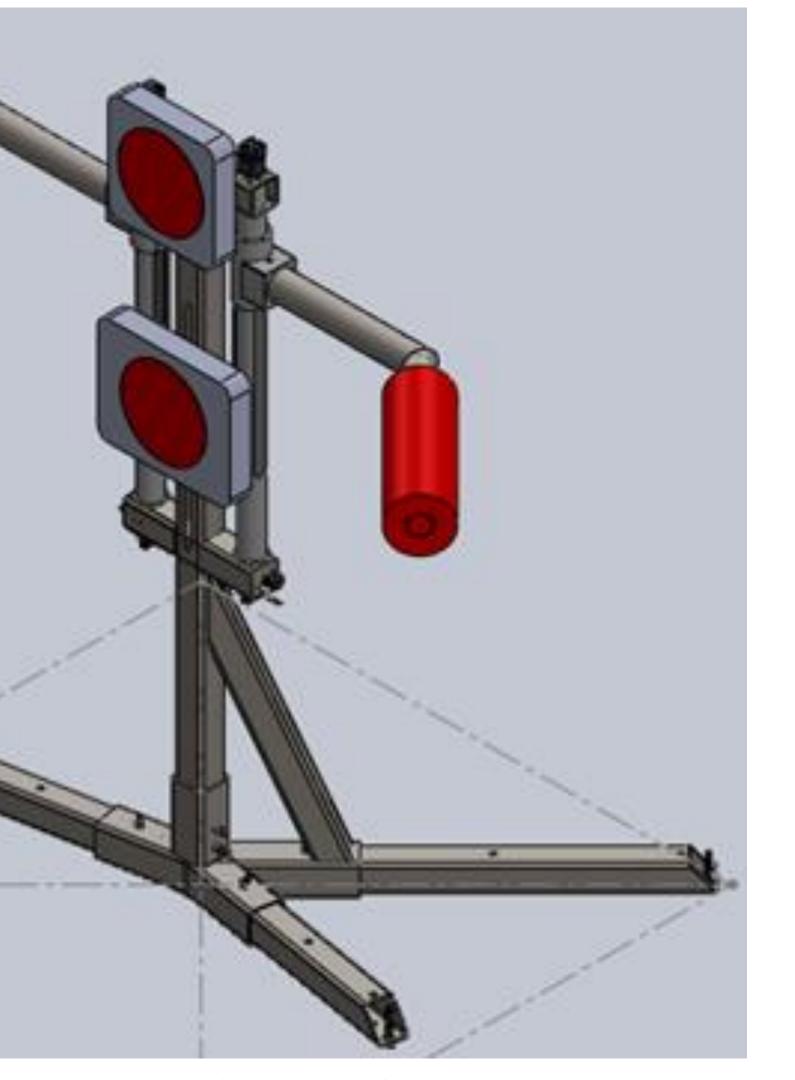
FEA Analysis:

Analysis was completed to ensure the critical point (arm connection) did not exceed the yield strength and allowed for 50,000 cycles without failure.

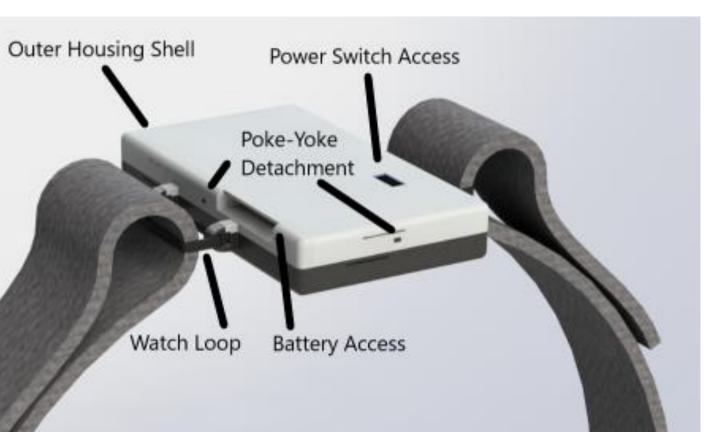




Final Design



Band Mounted Accelerometer



The Band Mounted Accelerometer provides force feedback through acceleration data. Bands will be strapped to the user's