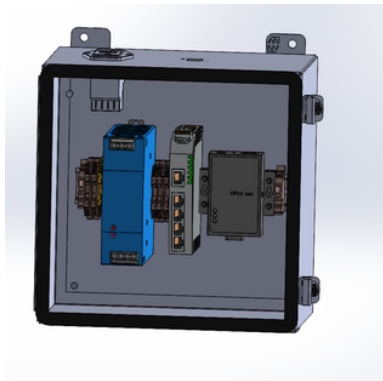
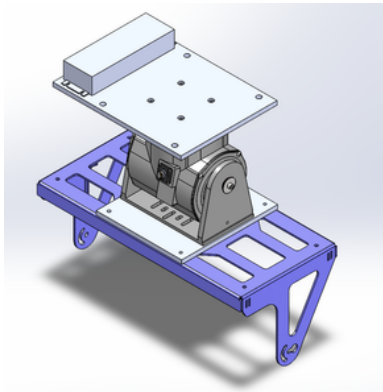


VIRTEK VISION MOTORIZED MOUNT



Electrical Panel Design



Mount Solidworks Model



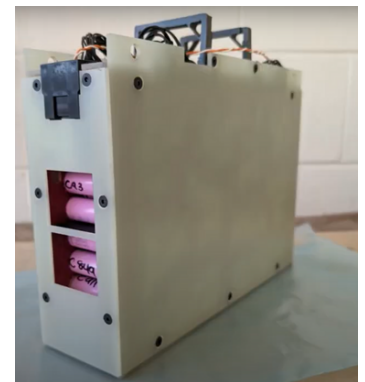
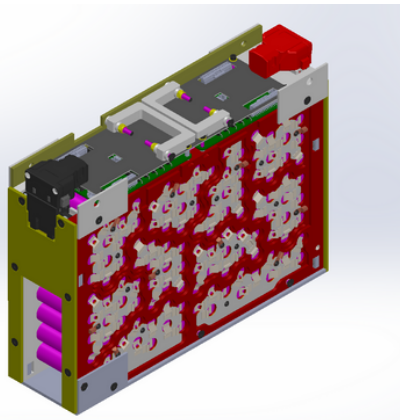
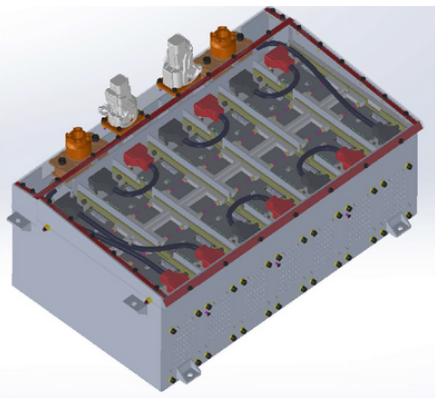
Mount Software

- Lead project by designing the mechanical, electrical and software aspects needed to control motorized mount for positioning Virtek Laser Projectors in manufacturing environments.
- Designed and sourced parts for an electrical panel and custom cables that convert **Ethernet** to **RS-485** as well as provide power and communication to both the motorized mount and projectors.
- Created a full-stack **C++** desktop application to manually jog or automatically move to positions based on the state of the projector using an **UART**-based protocol to communicate with the hardware.
- Designed plates in **Solidworks** to support a mass >25kg including the motorized mount, power supply, and projectors.
- **Soldered** cables and **milled** plates used for a fully functioning prototype displayed at trade shows.



Mount displayed at Trade show

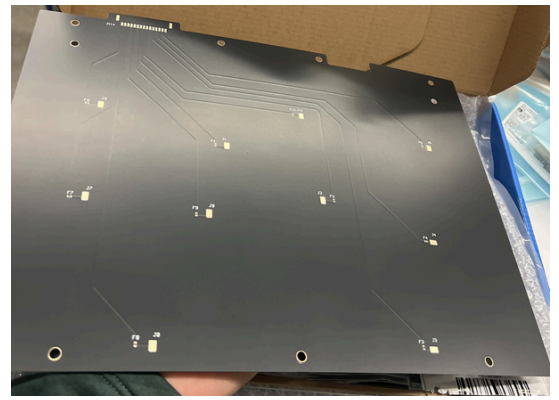
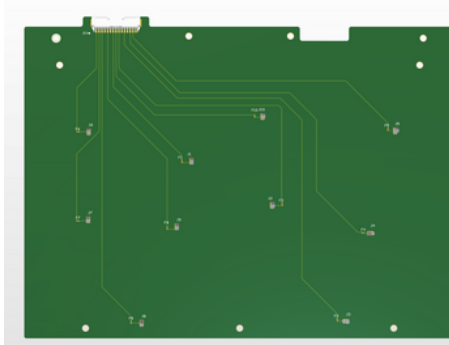
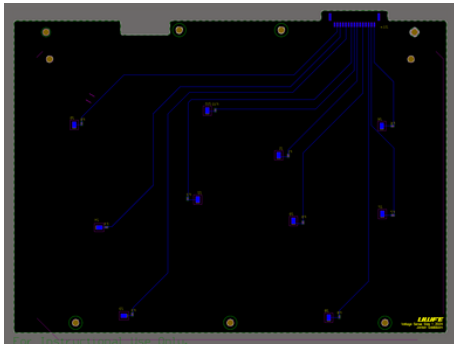
FORMULA ELECTRIC - BATTERY SEGMENT DESIGN



- Collaborated within a small team to develop the design of the segments for a 588V battery system, used to power an electric racecar. The design was executed using **Solidworks**, the segments are currently in the manufacturing phase.
- Implemented handles and mounting shims ensuring both security and ease of removal within the enclosure allowing for simple serviceability.
- Integrated the segment terminals to allow for electrical flow between segments this including interfacing with the busbars, mounting the terminals, insulating the cells and creating slots for routing the wires between the different segments.
- Created routes for the sense wires from the Accumulator Management Unit PCB to the thermistors and bus-bars using the **Solidworks Routing Tool**. Carefully managed wire placement within confined spaces to prevent potential arcing between busbars.



FORMULA ELECTRIC - VOLTAGE SENSE PCB

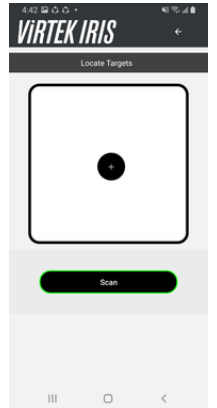
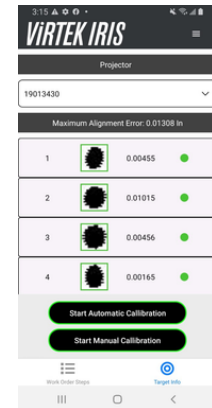
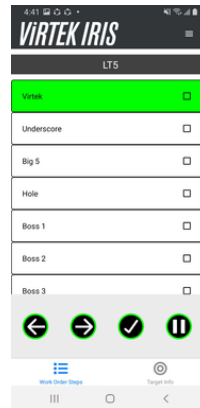
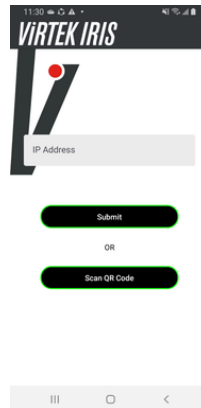
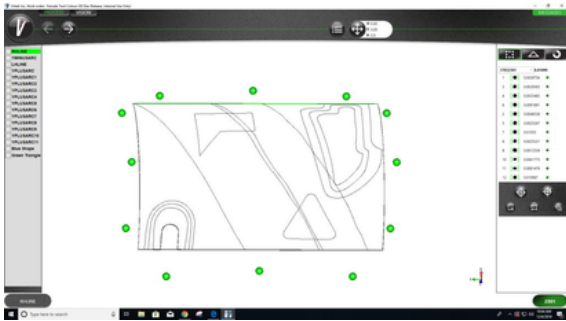


Layout

PCB

- Designed two PCBs to sense voltage of cell groups by directly contacting busbars with spring loaded connectors
- Replaced wired connections that were causing faults while driving because of frequent disconnections with fuses
- Reduced part count from 22 to 2, allowing for significantly easier assembly

VIRTEK VISION MOBILE APP

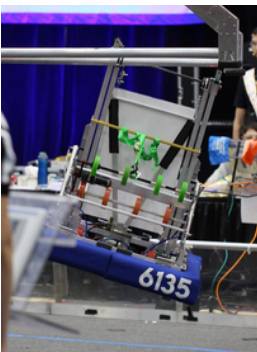


Virtek IRIS Software

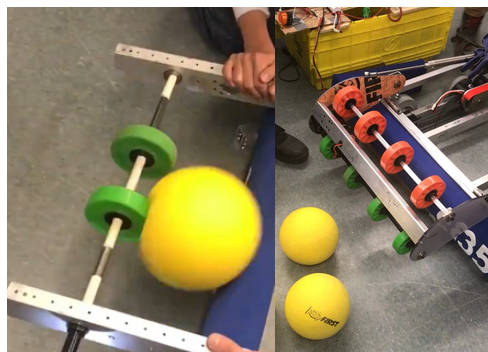
Mobile App

- Independently developed **React-Native** mobile app to emulate Virtek's flagship Iris laser projection software.
- Used existing **Restful API** and **RabbitMQ** functionality to control projector workflow and reflect what is happening on the desktop eliminating the need to interrupt the manufacturing process by returning to the computer.
- Added functionality for the next release of the flagship software using **C#** to display a QR Code allowing the user to easily connect the mobile app to the desktop software.
- By the end of the coop term the app was displayed at a trade show and beginning the testing phase, it is expected to be released on the Play Store and App Store within the next year.

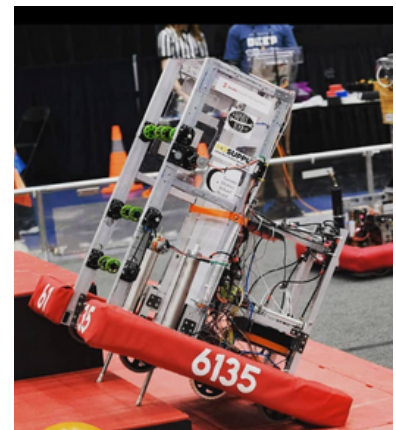
FIRST ROBOTICS COMPETITION TEAM - ARCTOS 6135



Robot Hanging on Bar



Prototype and Manufactured Intake



Stair Climbing Mechanism

- Worked with a team to design, program and manufacture three 150-lb robots within a 6-week time frame.
- Collaborated using **Fusion 360** to design and integrate drive train, manipulators, and electrical components.
- Assisted in the prototyping, designing and fabrication of mechanisms to intake balls, pull robot up onto a bar, and climb stairs using compliant wheels, chain elevator and pneumatic pistons.
- Maintained a role on the leadership team for 3 years as team captain training lead and business lead