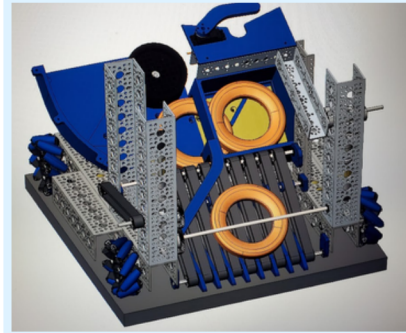
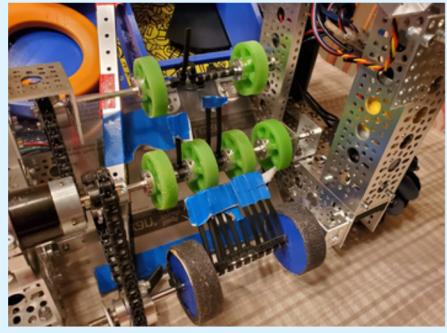


# JOEY MILLER

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## 2020-2021 FIRST TECH CHALLENGE ROBOT



### What

- Use **SolidWorks** to design a new intake system for the 4" foam ring game pieces.
- Did research on other team's designs to see what worked best.

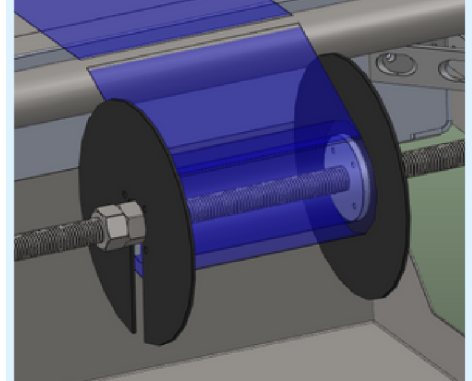
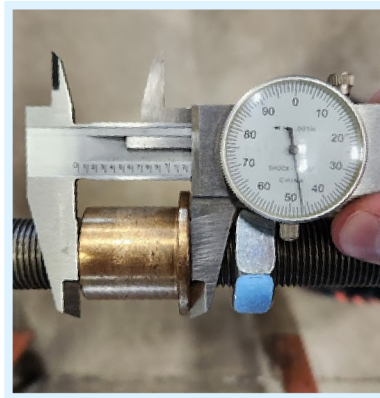
### How

- Designed a new belted intake system for a more continuous intake speed.
- Created 15 custom 3D printed parts for the new design.

### Results

- The new design qualified my team to compete in the world championships by placing second at the Minnesota State Tournament.
- Nominated for the 3D printing award at the MN State Tournament.

## REMOVEABLE SPOOL CHUCK - ASPECT AUTOMATION



### What

- Tasked to create an assembly that can replicate the functionality of an existing removable spool chuck.
- Mount the new design to a different part of the machine without spatial conflicts.

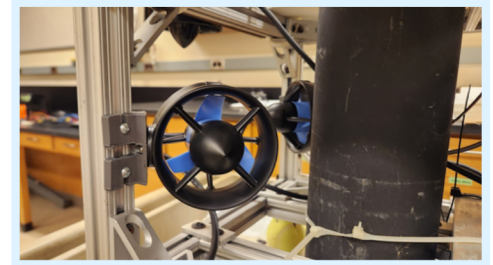
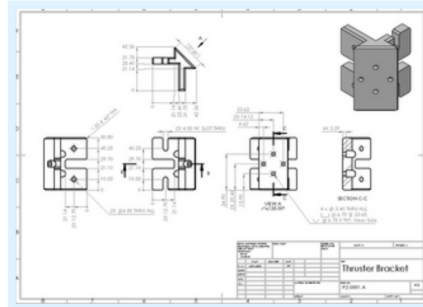
### How

- Measured the physical mount location and interacting parts.
- Used **SolidWorks** to create custom parts for the chuck.
- Created detailed manufacturing drawings for all custom parts.

### Results

- Design of the assembly was approved for production on the machine.
- All custom parts were manufactured and installed.

## THRUSTER MOUNT BRACKET - DIVER TEAM, MINE ENTERPRISE



### What

- Mount a BlueRobotics T200 thruster to an underwater robot.
- Thrusters should be able to mount to the robot regardless of hull design.

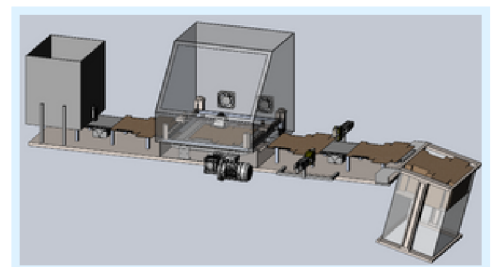
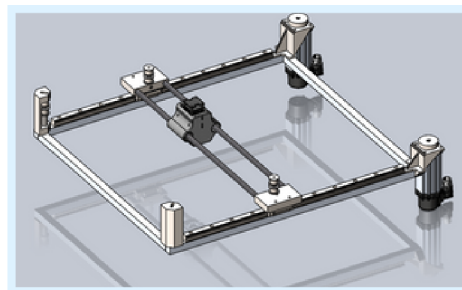
### How

- Used technical documentation to find the thruster hole pattern.
- Created a custom 3D-printed part that mounts to the t-slot extrusion frame.
- Researched 3D printer material mechanical properties to reduce delamination between layers.

### Results

- Mounted the brackets and thrusters on the proof of principle robot design.
- Thruster and bracket attach to the frame securely.

## FOLDED PACKAGING AUTOMATION MACHINE - MENTOR CLASS



### What

- Asked to make a project that displays what you learned from your mentor over the semester.
- Decided to create a custom automation solution for the manufacturing of folded cardboard packaging.

### How

- Used **SolidWorks** to create the design of the automation machine.
- Researched and sized components to be included in the machine design.
- Used a Core-XY system for the laser to increase speed and precision of the tool head.

### Results

- Used documentation to create a timing diagram for the overall machine.
- Generated a quote estimate for the final machine.