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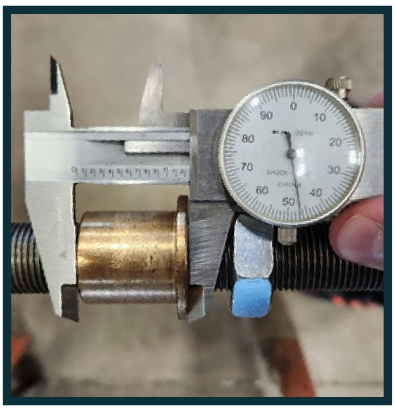
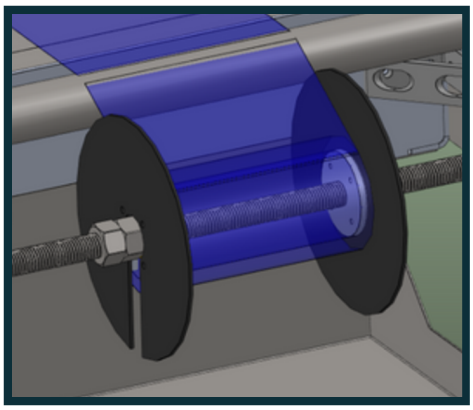
REMOVEABLE SPOOL CHUCK - ASPECT AUTOMATION





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.

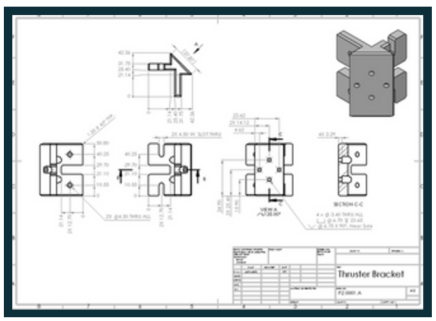
How

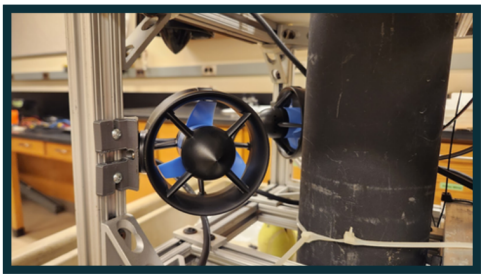
- Measured the physical mount location and interacting parts.
- Used **SolidWorks** to create custom parts for the chuck.
- Created detailed manufacturing drawings for all custom parts.

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.

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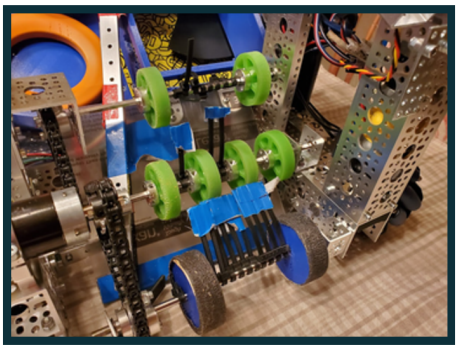
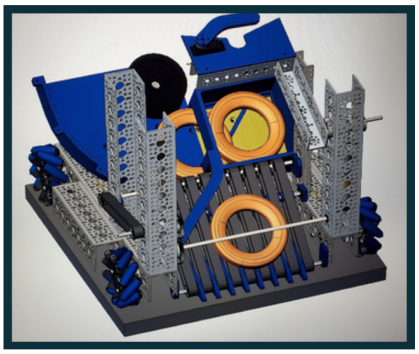
2020-2021 FIRST TECH CHALLENGE ROBOT





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.

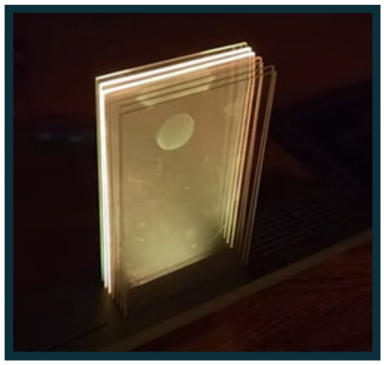
How

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

Results

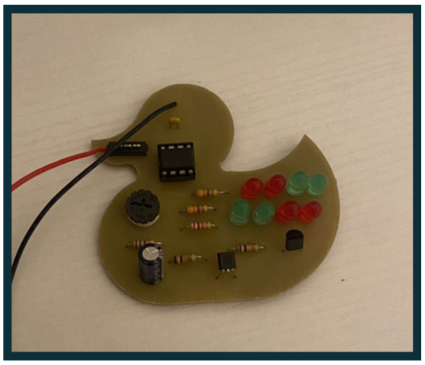
- The new design qualified my team to compete in the world championships by placing second at the Minnesota State Tournament.
- Nominated for the 3D printing award at the MN State Tournament.

EDGE LIT CLOCK



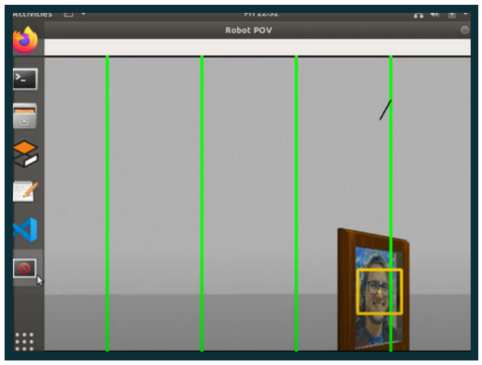
- Developed housing and code for a transparent 7-segment display on etched panels
- Soldered and tested display to verify interface between a real-time clock module

CUSTOM PCB DESIGN



- Designed custom PCB from a given schematic
- Successfully soldered and tested completed PCB

ROS FACE TRACKER



- Used ROS to create a face-tracking robot programmed in Python
- Implemented OpenCV by using image cascades for face detection
- Simulated robot movement in Gazebo