

Beach Cleanup Bot

Team Beach Cleanup Boys

SAN DIEGO STATE UNIVERSITY
College of Engineering



Project Mission

Problem Statement: Many of the earth's key species that we rely on as humans reside in the ocean. Trash left of the beaches has the potential of making its way into the ocean and putting these species in harm's way. The issue we face is that today there are few options available to efficiently clean up and dispose of this trash.

Mission: Team BCB is aimed towards creating one of the world's first robots capable of autonomously navigating the beach and effectively picking up trash without human operation nor direct interaction. The robot is aimed to collect trash items such as cigarette butts, bottle caps, food wrappers, and other micro-plastics within a predesignated area.

Specifications

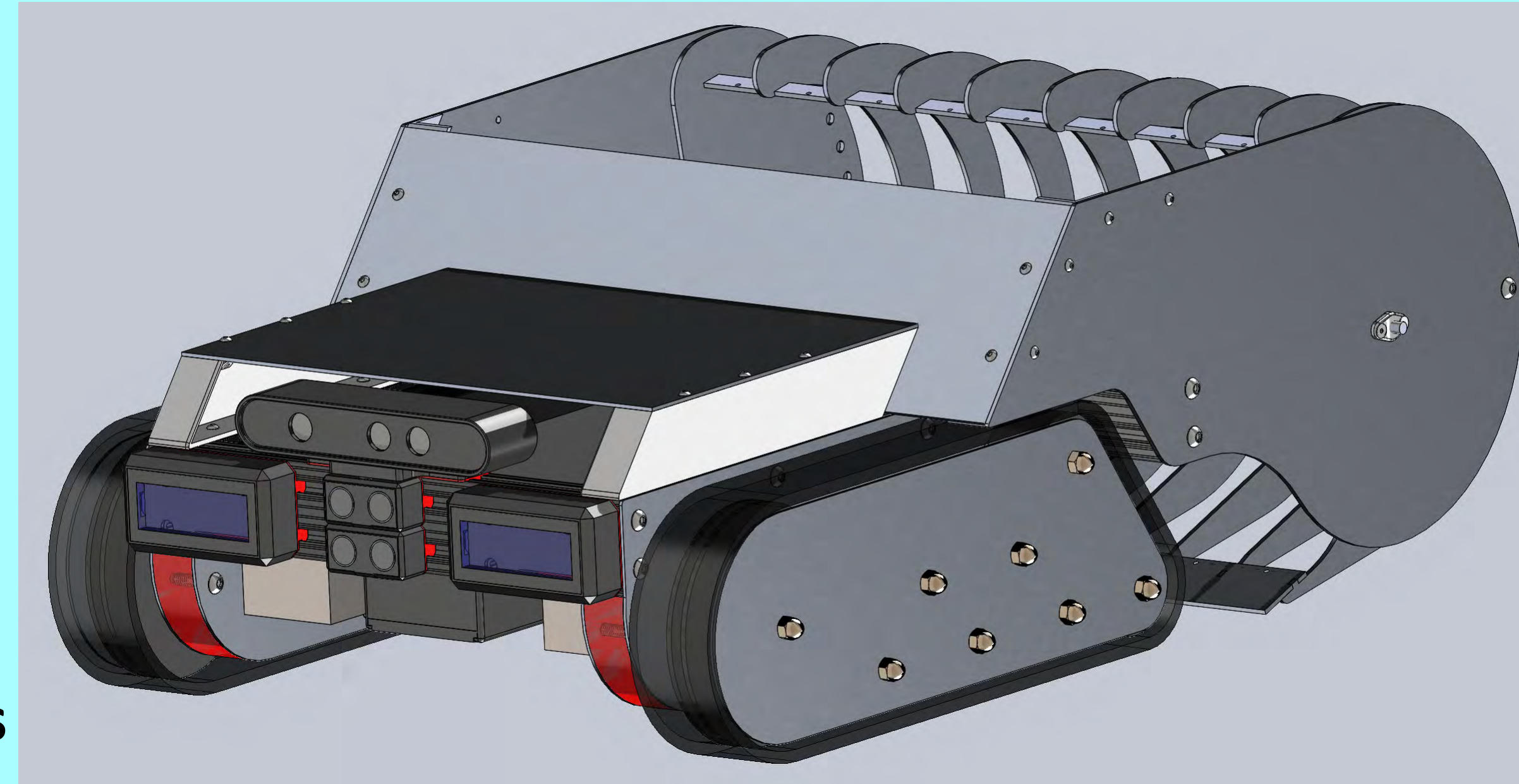
- Autonomously navigate different beach terrains to clean trash in both flat and uneven conditions
- Collect a minimum trash size of cigarette butts and a max size of surgical masks
- Operate for 30 minutes
- Avoid inclines and drops greater than 25 degrees
- Avoids objects within a 3ft range
- Optional remote control operation

Project Sponsor

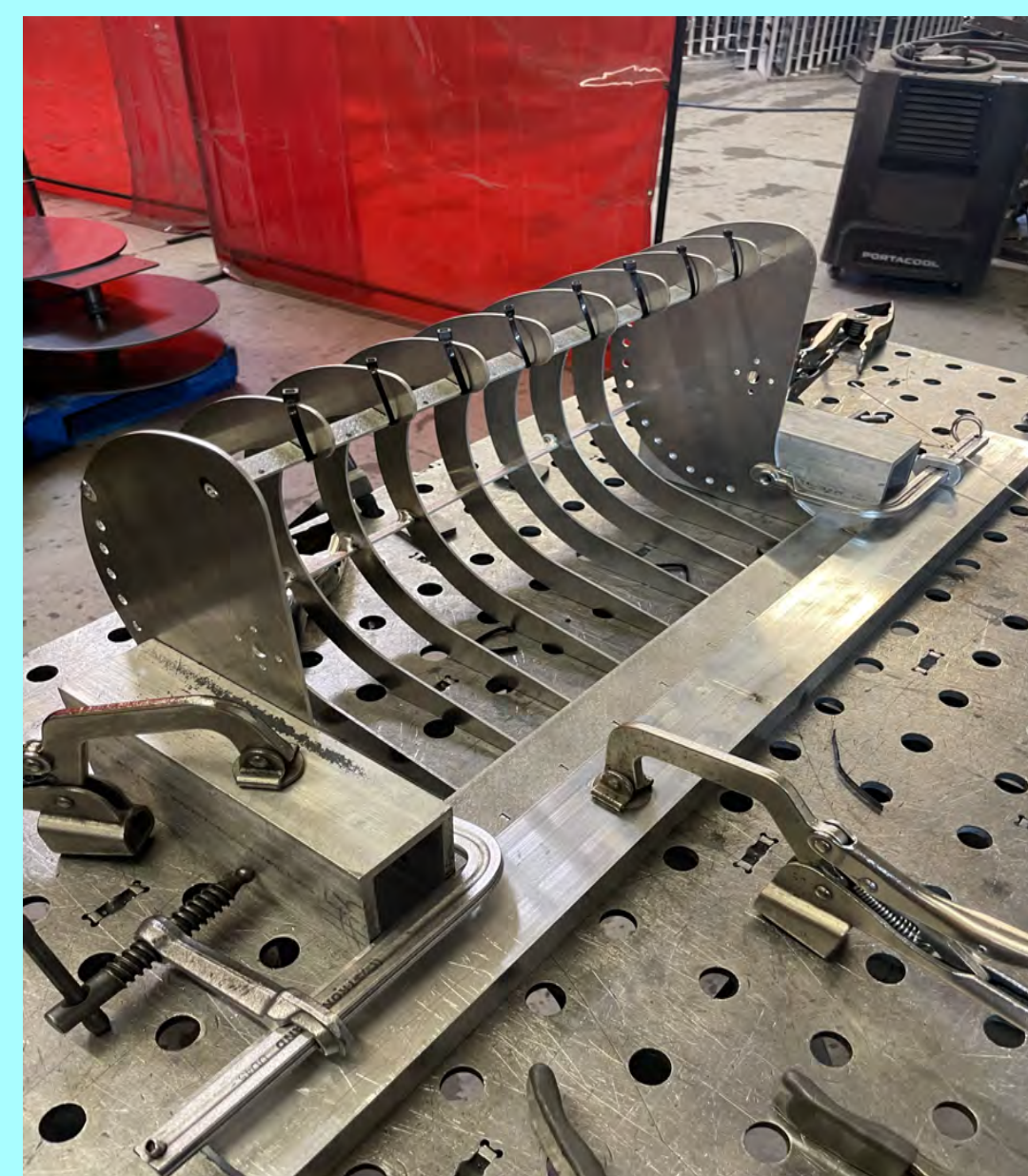
Team Beach Cleanup Boys would like to thank the **Engineering Department of San Diego State University** for sponsoring our project.

We would also like to extend a special thank you to Dr. Shaffer for making this project possible!

Design



Manufacturing

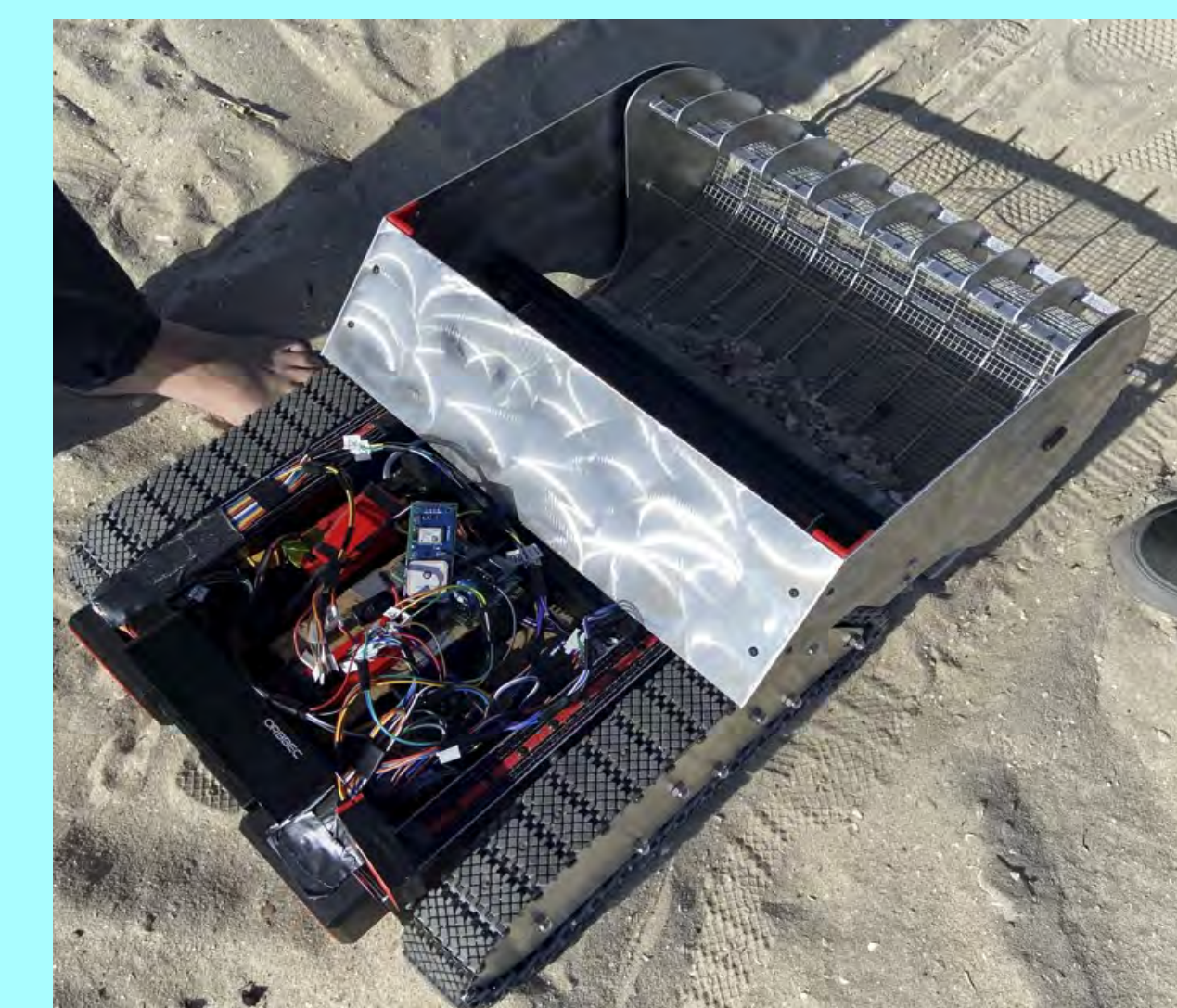


Fabricating Collection System

Assembling Drivetrain Tracks



Testing

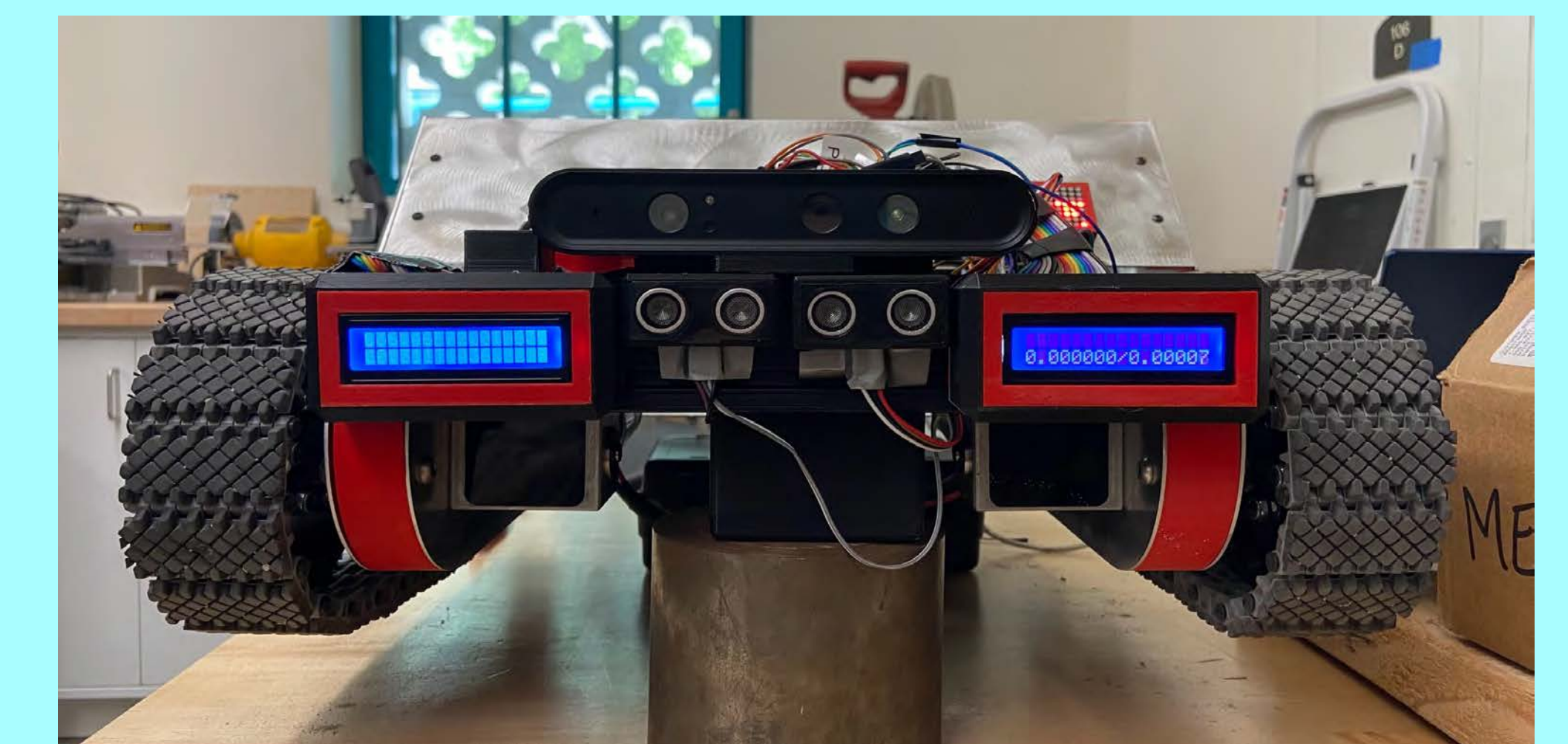
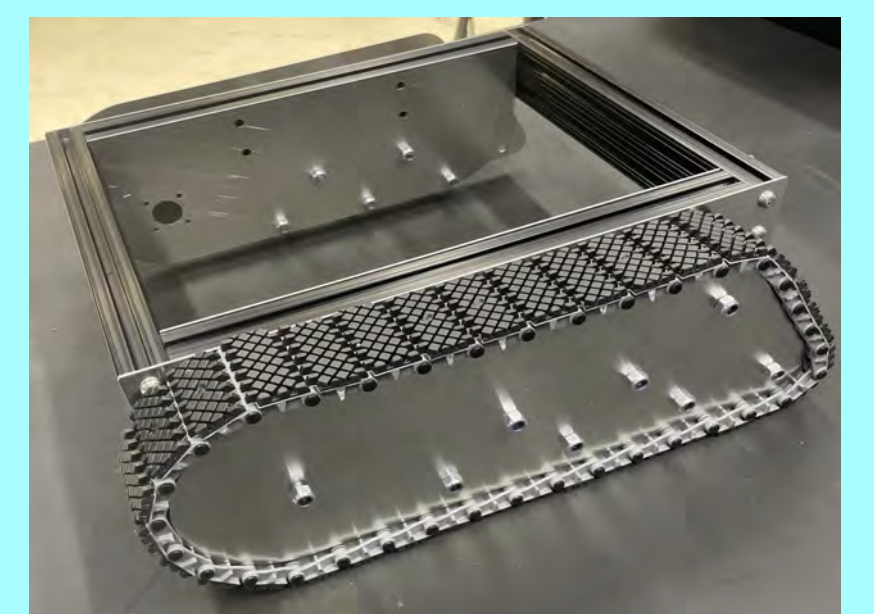


Beach testing of tank tracks, collection system, and total electronics integration

The Tech

Electronics

- Ultrasonic Sensors (shown)
- GPS Sensors
- Camera (Orbbec Astra)
- Dual LCD Screens
- Arduino Uno
- Raspberry Pi
- Brushed Planetary Gear Motors
- 12V 10Ah LiFePO4 Battery



The Beach Cleanup Robot's LCD screens integrate all sensors and tech to provide digital readouts on the robot's position, direction, surrounding temperature, humidity and tilt angle.

The Team



Left to Right

Spencer Dickson, Matthew Blackmun, Ben Hayenga, Jason Bethmann, Kyrel Polifrone