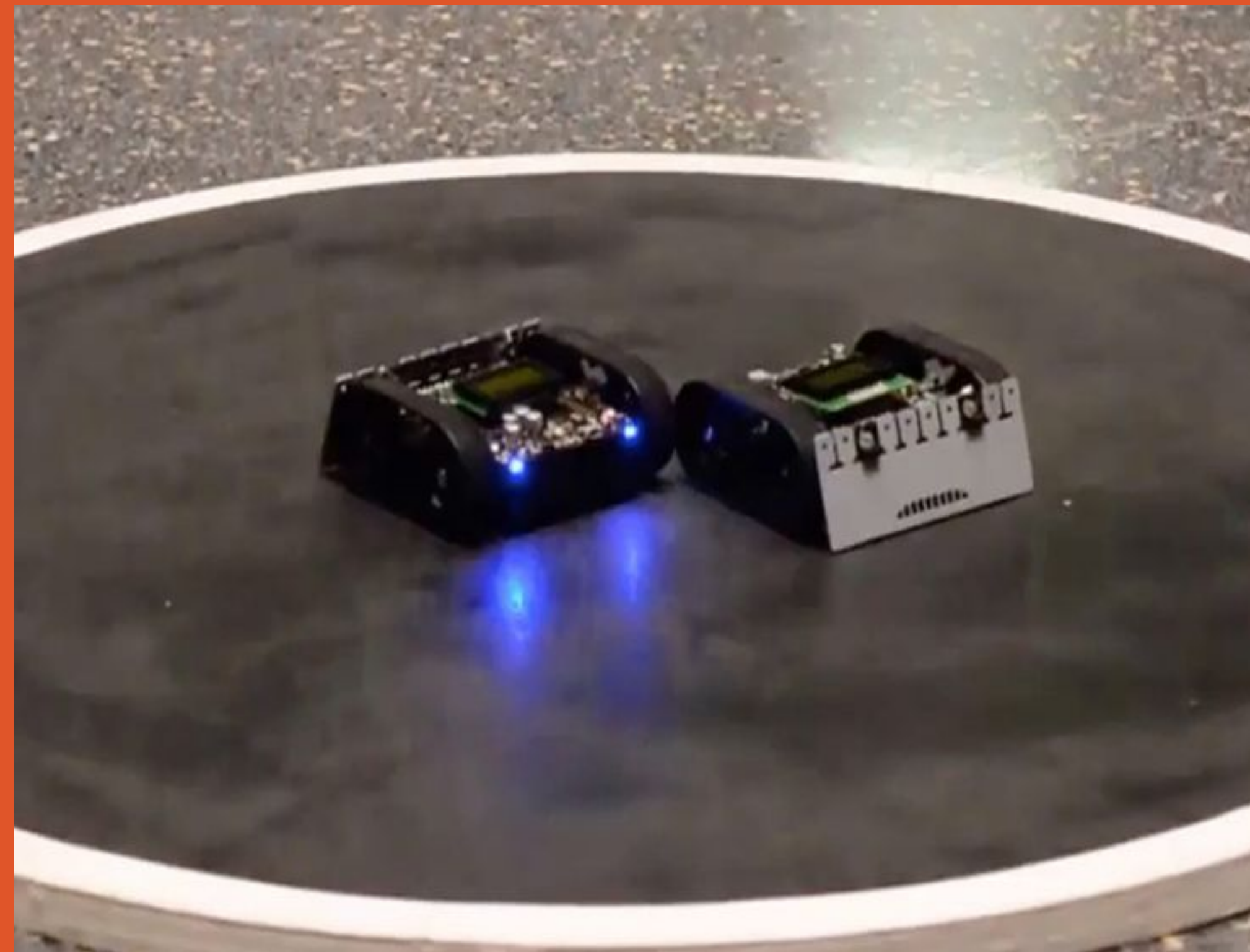## Team Overview

- The 2023 Sumobot team 609A is comprised of 3 senior capstone members (Lucas Cooper-Murray, Bryce MacGragor, and Dawson Poppitz).

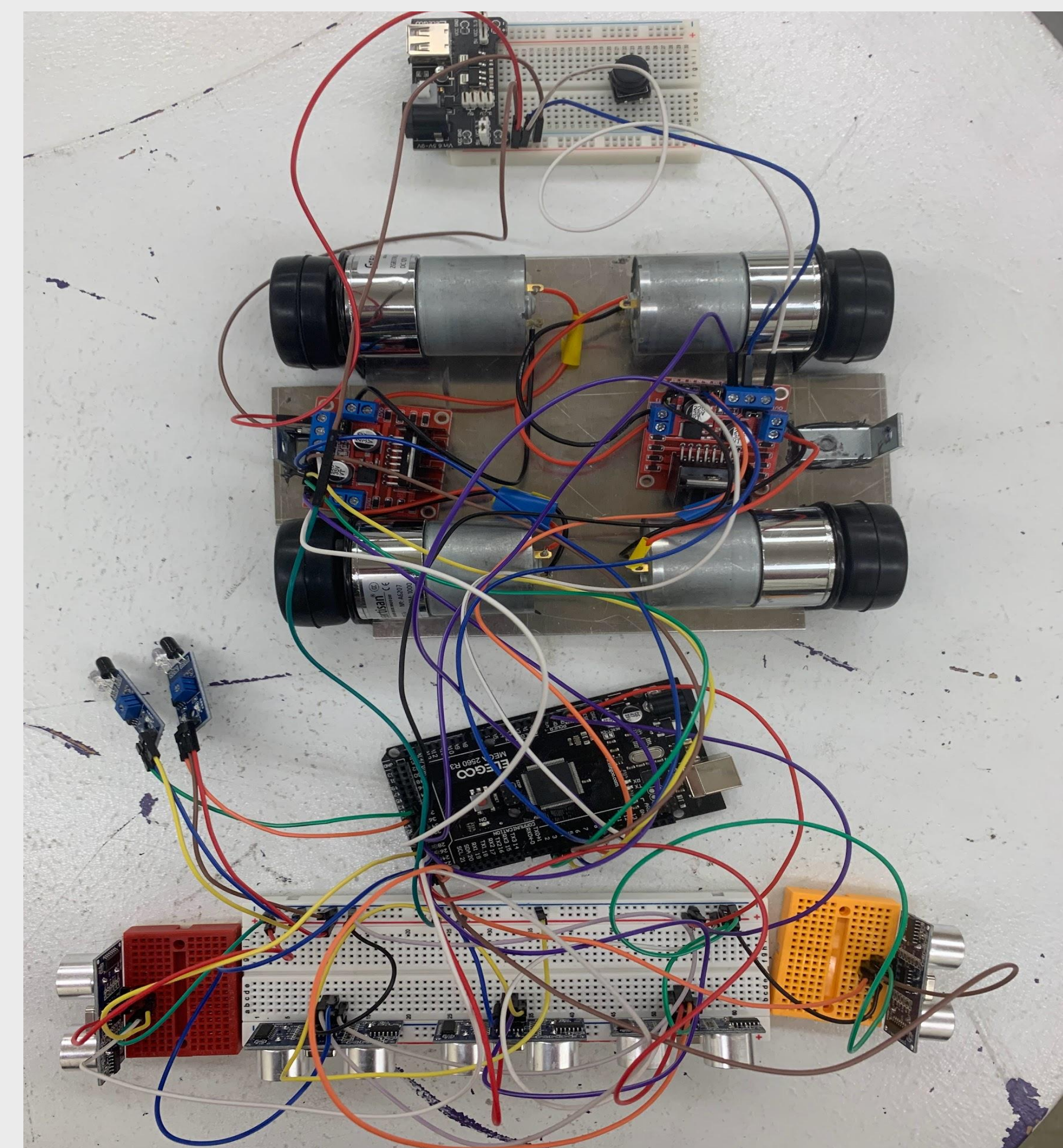
Competition Requirements and Restrictions

- Must fit in a 20 by 20 cm box.
- Sumobot must weigh less than 3 kg
- No weapons that can damage opponent.
- Must detect the opposing sumobot and the ring.
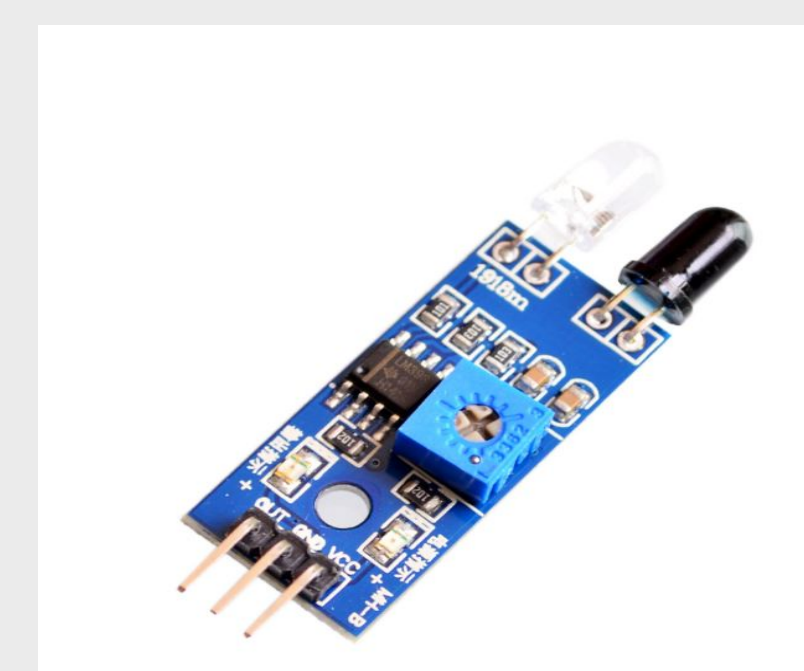

The Sumobot

Competition Overview:

- Head to head match takes place inside a circular arena called a Dohyo.
- Each match has 3 rounds lasting 1 minute each. Best 2 out of 3 wins.
- Each Sumobot must be fully autonomous with no team control.

Circuitry/Sensors/Power:

- The Sumobot is powered by a 14.8 V battery that powers four 12V 1000 RPM motors
- The Sumobot is equipped with 5 ultrasonic sensors to detect the opponent, and 2 IR sensors to detect the white line of the ring.
- All main systems are controlled by an Arduino Mega 2560.
- Seperate sub-circuit using an Arduino Nano that will control the deployable ramps.
- The entire system will be initiated by the push of a button

External Construction:

- The body and chassis of the Sumobot were fabricated from aluminum sheet metal
- Holes were punched out to mount the ultrasonic sensors
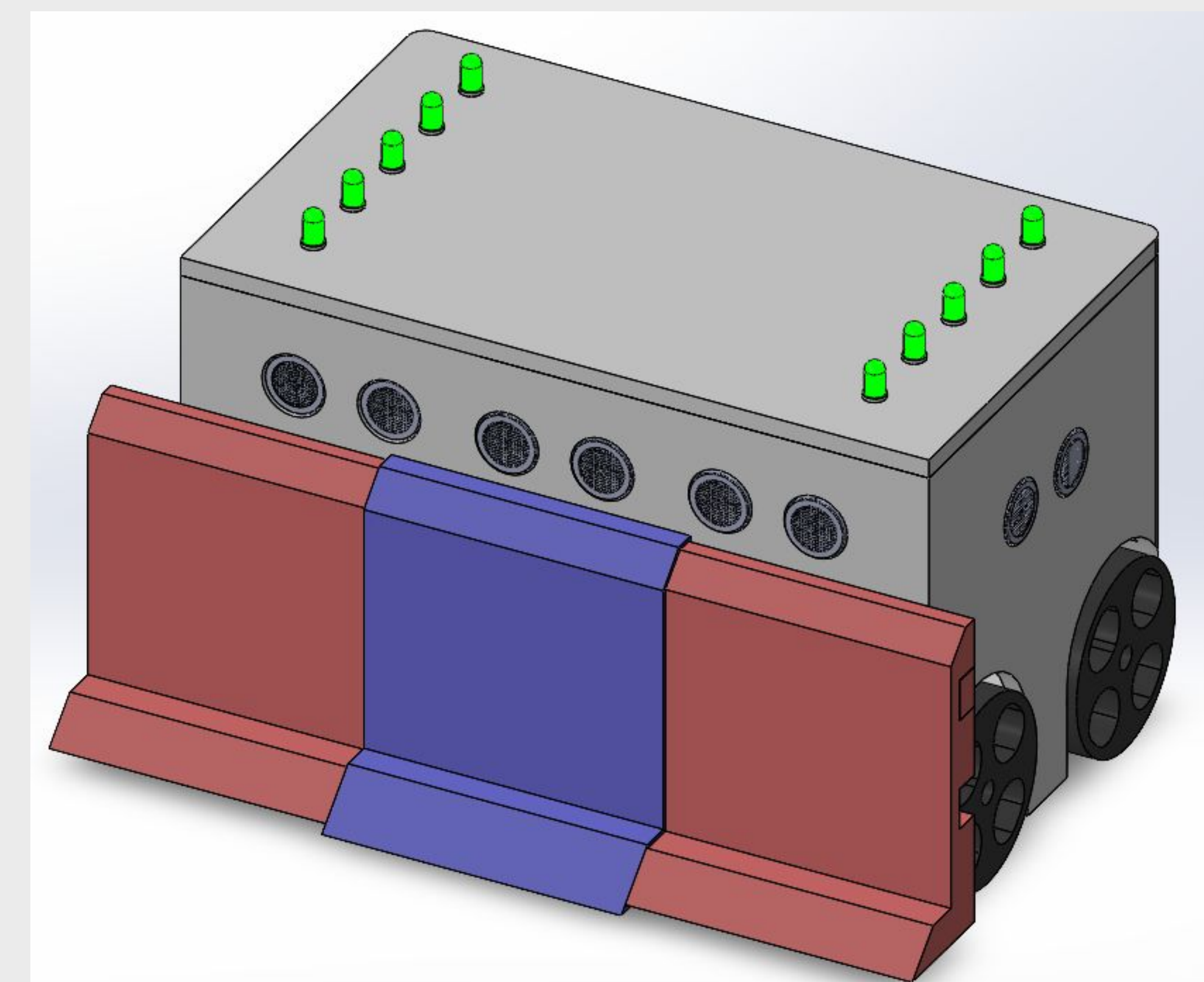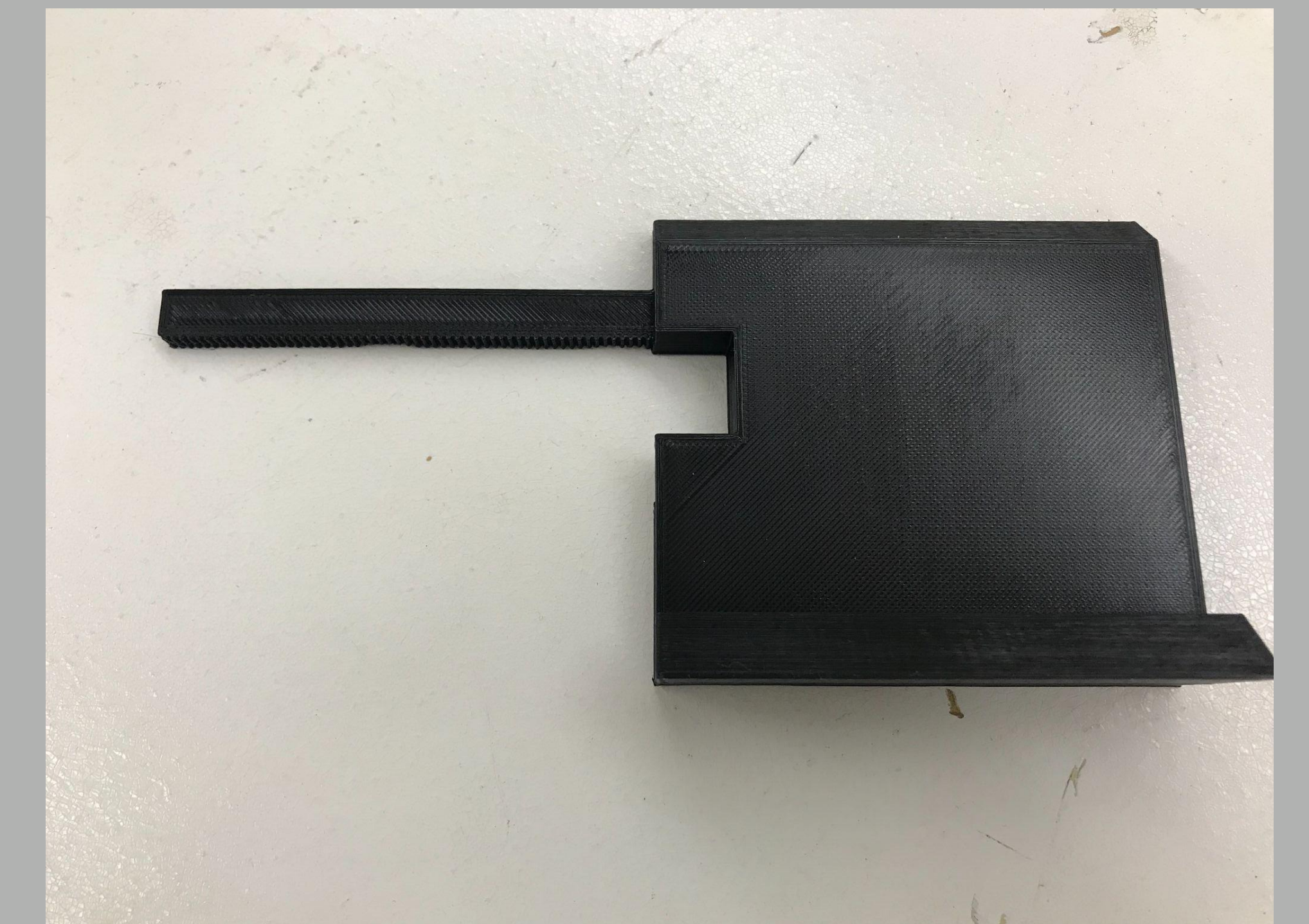- The exterior of the Sumobot was sandblasted

Infrared Obstacle Detection Sensor

HC-SR04 Ultrasonic Sensor

Preliminary Solidworks Model of the Sumobot

Deployable Ramps

- In order to increase the chance of making contact with an opposing Sumobot, Team 609.1 decided to create a set of small ramps that will extend from the sides of the robot.

- The ramps pictured above slide out of the side of the Sumobot on a set of rollers using a rack and pinion setup. A small stepper motor drives the pinion gear that meshes with the teeth on the rack to extend the ramps.

- Initially, the rack, pinion gear, and ramp were three separate parts. However, the rack and ramp were combined into a single component to save space and reduce the number of overall parts.