SUMOBOT COMPETITION: THE BOTTLEBATS

What is SumoBots?

The SumoBot competition is a battle where two robots face off against each other with the goal of staying in the ring, known as the dohyo.

For this competition, each team was given restrictions:

- The base cannot be greater than 20x20 cm.
- The weight cannot exceed 3 kg.

Unlike Battlebots, Sumobots are not allowed to have any weapons or attachments that would do intentional harm to their opponent. The main goal is simply to push the opposing robot out, or to dodge them to stay in the ring.

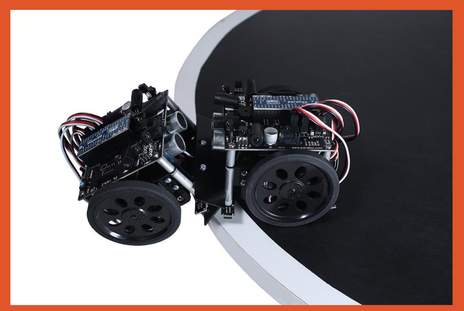

Figure 1: Example of the SumoBot Competition

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Design Process:

Original Concept:

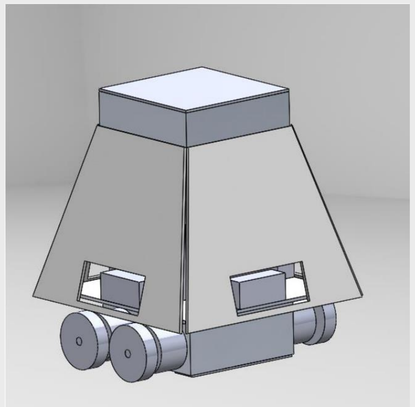

Figure 2: Original CAD Concept of The Robot Design

- Large base with a smaller top
- Angled panels to protect wheels and sensors
- Long column in the center to contain batteries and wires
- Good start, but many flaws were discovered

Updated Concept:

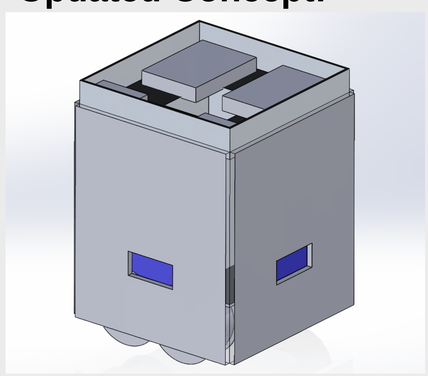

Figure 4: Updated Robot Concept

Some big changes were made to this version, including:

- Top section enlarged to fit extra electronics
- Panels are no longer angled, fixing concerns about size and sensors
- Custom designed 3D printed Wheels

Initial Physical Design:

Figure 3: First Physical Prototype Model

- First Physical Build of the robot
- Made of wood to save on cost
- Clear plastic resin for panels.
- Highlighted design flaws, and paved the way for improvements to the final design

Manufacturing:

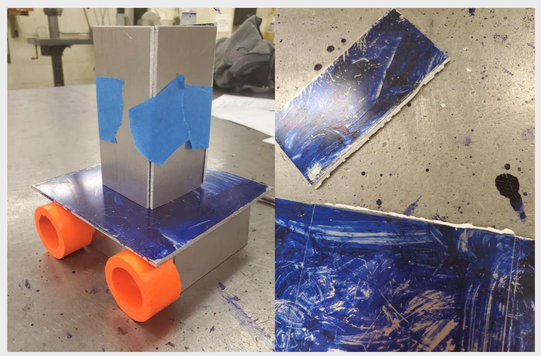

Figure 5: Final Prototype Model

- Thicker than expected aluminum sheets
- bending machine broke aluminum
- Each part had to be individually cut
- Corner brackets are used to combine instead of welding parts together

Sensors Used

- Ultrasonic Sensor: We are using this sensor to find the opposing team's robot in the ring so we can approach it and attempt to push it out (Figure 6).
- Infrared Sensor: We are using this sensor on the bottom of the robot to detect where the ring will end so we can have it stop in time (Figure 7).

Figure 6: Ultrasonic Sensor That Was Used

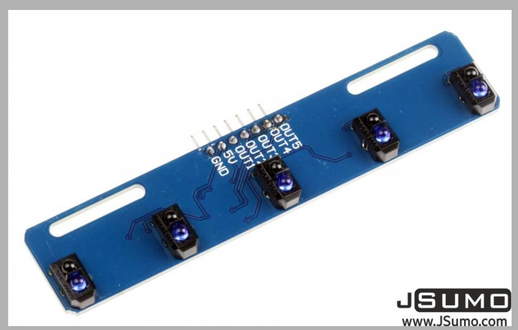

Figure 7: The Infrared Sensor That Was Used.

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