WHAT IS SUMOBOTS?

SumoBot Competitions consist of one robot trying to eliminate the opposing robot(s) within a ring, known as dohyo; this is done by pushing the robot out, or incapacitating it, within the time limit.

***Figure 1**. Official SumoBot Competition*

COMPETITION REQUIREMENTS

- 3kg weight class (6.6 lbs)
- 20cm x 20cm
- Contains one or more offensive and/or defensive mechanisms other than a ramp
- Must have non-standard body geometry (not a cube)
- User-controlled (RC)

Oregon State University

BENNY BULLDOZERS

SPONSOR: OSU SCHOOL OF MIME

MANUFACTURING:

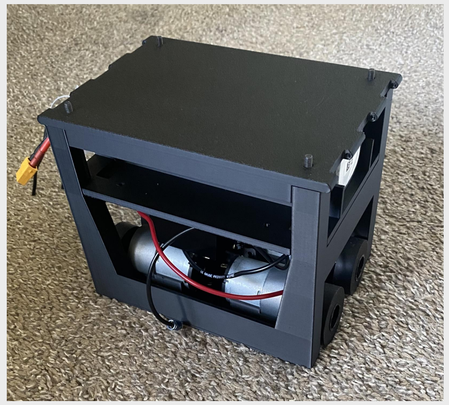


***Figure 2**. Internal frame of SumoBot*

The SumoBot is made up of three main parts:

- The internal frame (pictured above)
- Sheet metal walls
- The defensive mechanism, side skirts

The internal frame is a multi-level design, where the driving motors are housed on the base of the frame and the necessary electrical components sit on the middle plate, shown in **Figure 2** above. This frame was 3D printed using PLA because of its flexibility and easy accessibility of the material.

DEFENSIVE MECHANISM:

Our defensive mechanism employs the used of hinged side skirts and shock absorbers from an RC car to dampen or reduce the impact from the opposing SumoBots.

***Figure 3**. RC Car Shocks*

ELECTRICAL COMPONENTS:

- x4 1000 RPM Geared DC Motors
- Cytron Dual Motor Driver (30 Amp 7-35V)
- FS-i6X 10CH RC Transmitter and Reciever
- 14.8V 6000mAh LiPo Battery

All components listed above are shown in **Figure 4** below. The displayed electronics are housed within the different levels of the internal frame shown in **Figure 2**, to the left.

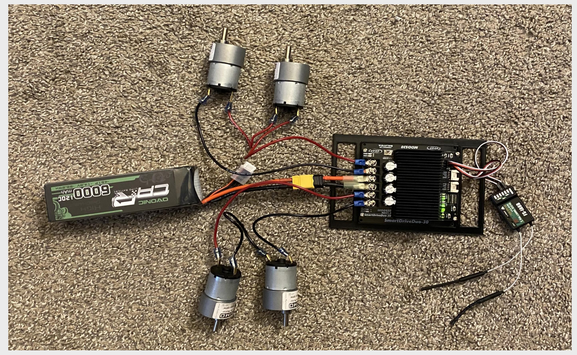


***Figure 4**. Fully Exposed Electrical Components*

OFFENSIVE MECHANISM:

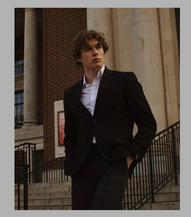
***Figure 5**. Front Fork Mechanism*

The offensive mechanism of our SumoBot are three front facing "forks". These forks act to ram and travel under the opposing SumoBot, reducing its traction, and giving our robot the upperhand.

MEET THE TEAM

Chase Cornett is a fourth year Mechanical & Manufacturing Engineering student hoping to pursue a career in the Aerospace Industry.

Sivan Fox is a fourth year Mechanical & Manufacturing Engineering student with a passion for renewable energy



Tristan Saultz is a fourth year Mechanical Engineering student with an interest in Aerospace engineering.

FEA ANALYSIS:

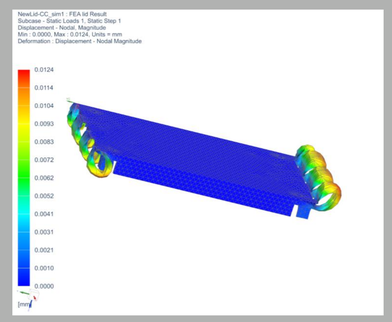


***Figure 6**. Stress Analysis of Chassis Lid*

We performed a stress analysis of the chassis lid because it acts as the hinge point of our defensive skirt mechanisms. The stress simulation shown above in **Figure 6** is representing a force of 6.5 lbs (equivalent weight of an opposing SumoBot) acting on each of our side skirts, a worst-case scenario.