

Team BumoSot Documentation:

This document covers the process of the creation of our sumobot for the advanced McMaster Sumobot competition. The rules and constraints of this competition may be found here:

<http://sumobot.ca/#/advanced-competition>

Planning and Documentation:

Date	Milestone
September 24 th	<ul style="list-style-type: none">• Preliminary Research• Code Framework• -Wheels• · Batteries
September 31st	Finish Code Ensure each component interacts with code properly Have final design modelled
November 7th	Set up Mock Ring Assemble control system First Functioning Prototype
November 11th	CNC Frame Begin Final Assembly
November 15th	Second Prototype Completion Testing and Iteration Obtain live robot to oppose
November 15th - 17th	Competition Simulation
November 17th - 24th	Iteration and Improvement
November 24th	Day of Competition

Meeting Schedule:

Meeting Number	Meeting Date
1	September 24th
2	September 28th
3	November 1st
4	November 4th
5	November 8th
6	November 11th
7	November 15th
8	November 18th
9	November 20th
10	November 22nd
Competition	November 24th

Software Ideas:

Containment Program
Optimal Robot Identification
Optimal Path Finding
Strategy Select
Mode Creation

Design Ideas:

Robot Functions upside down
Scoops on all sides (THE DEFENSIVE!)
Acceleration on the ramp
No front wheel
Multiple back wheels
Sensor tricks - reflect ultrasonic not where the robot is
Sensor defence

Movement Strategies:

- The backwards juke
- BOOM attack
- Side attack
- Side step dodge on start

Wheel Design Plan:

- Silicone caulking
- 3d printed cast

Materials needed to create silicon wheels:

1. 100% silicone caulking (looking for vinegar smell), not GE silicone 2
2. 100% Corn Starch

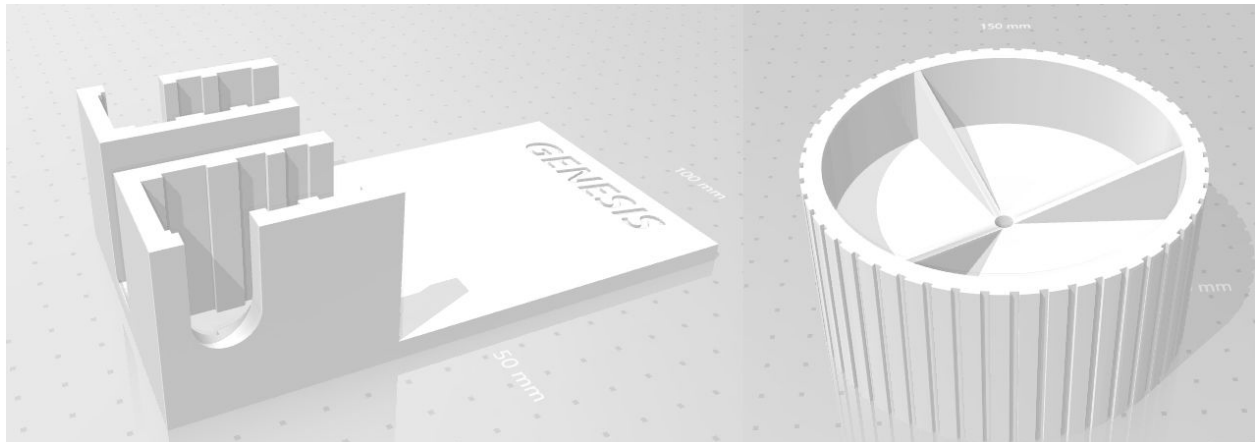
Steps:

1. Mix cornstarch, and caulking to desired texture and fill mold
2. Ensure all gaps are filled (use excess silicon just to be sure)
3. Wait at least 4 hours to let the solution settle
4. Open mold and remove excess silicone

Overall, the creation of silicon wheels were definitely the optimal choice for a few reasons. It allowed us to avoid buying expensive model wheels online. It also allowed use to quickly prototype many different wheel designs inexpensively. However the trade off is that the wheels are not as perfect as an injection mold for example.

Prototype Design GENESIS:

The purpose of this original prototype was to create a barebone model to ensure the functionality of our wheels, motor mounts, and motors. The name Genesis was chosen because this represented the start of our project



Desired Specifications for Final Frame:

Thicken motor mounts

Make screw holes bigger on motor mounts

Add screw holes for arduino, motor driver, ultrasonic sensors, IR sensors (with spaces for nuts)

Spaces for weights at front?

Spot for battery - replaceable

Holes for ultrasonic and IR sensors

Supplies Needed:

Motor Screws + washers

Ultrasonic Screws

IR screws

Motor Shaft Screws + nuts + washers

Weights

H Bridge Screws

Gorilla Glue