MEAM510 Design Review-2

Final Project - Group 3

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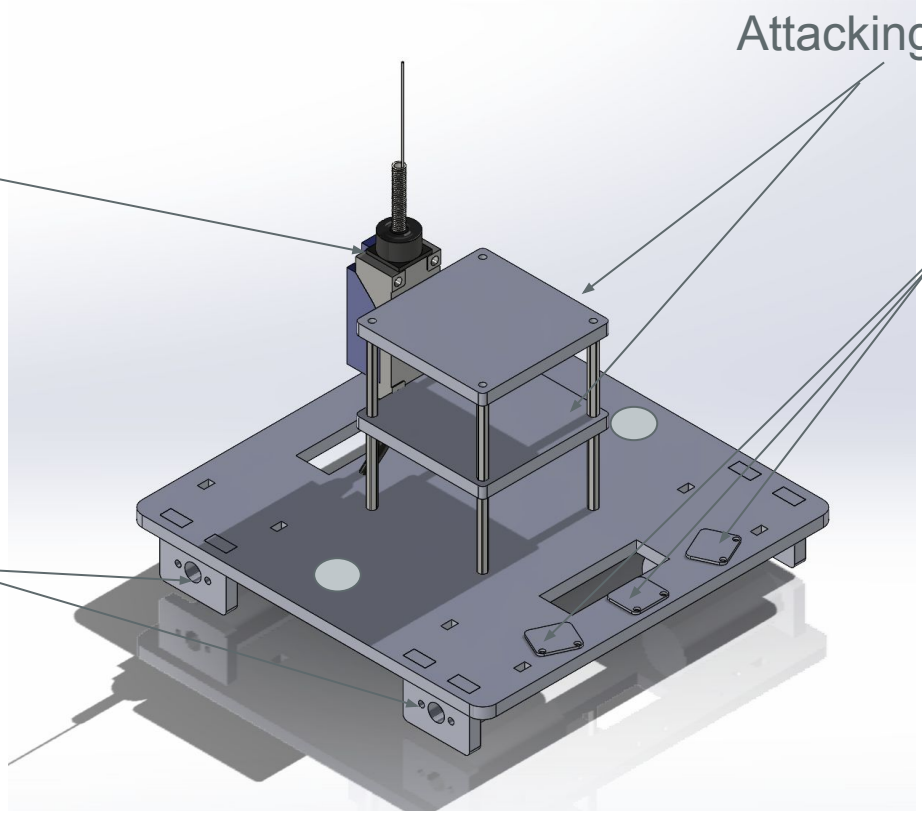
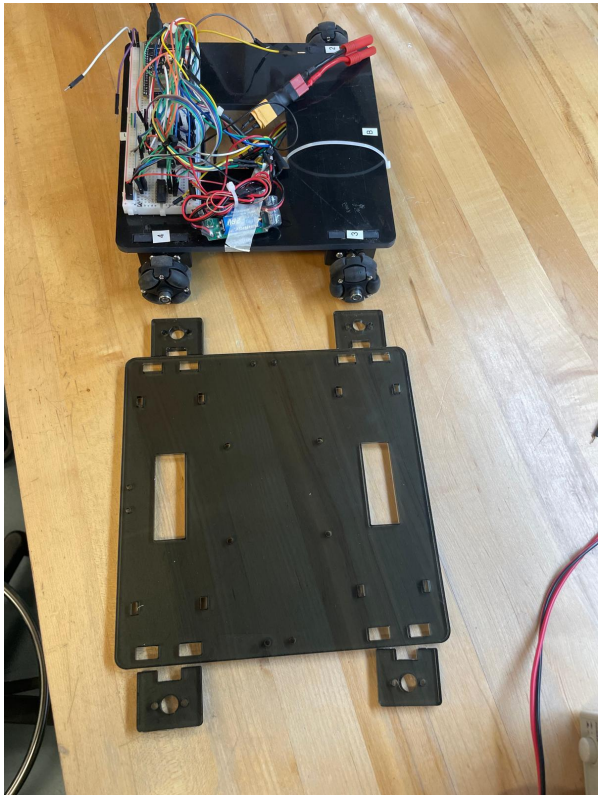
Updates Since Design Review-1

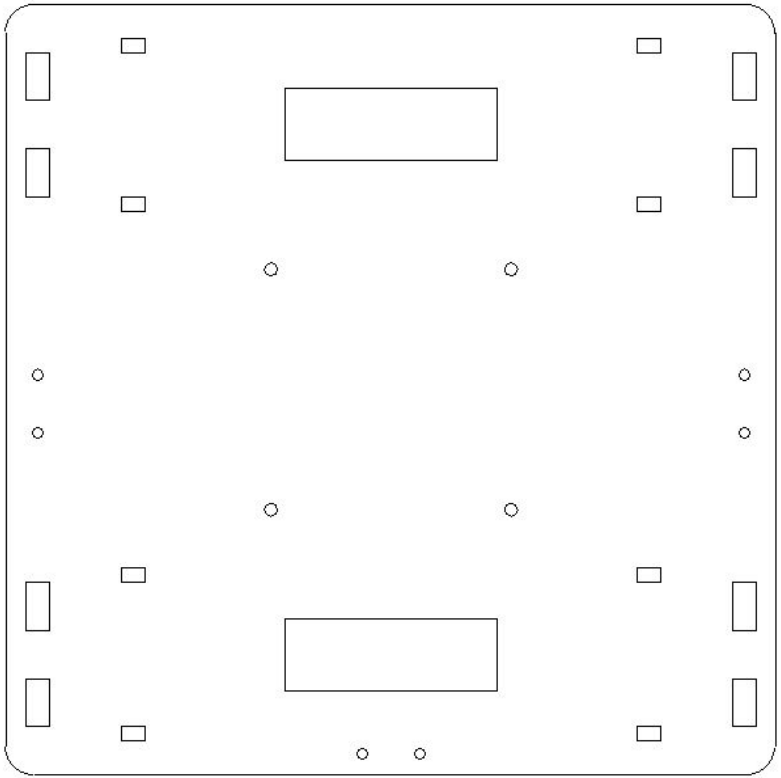
- Improved controller (Tuned Kp and implemented PD controller)

- Updated CAD

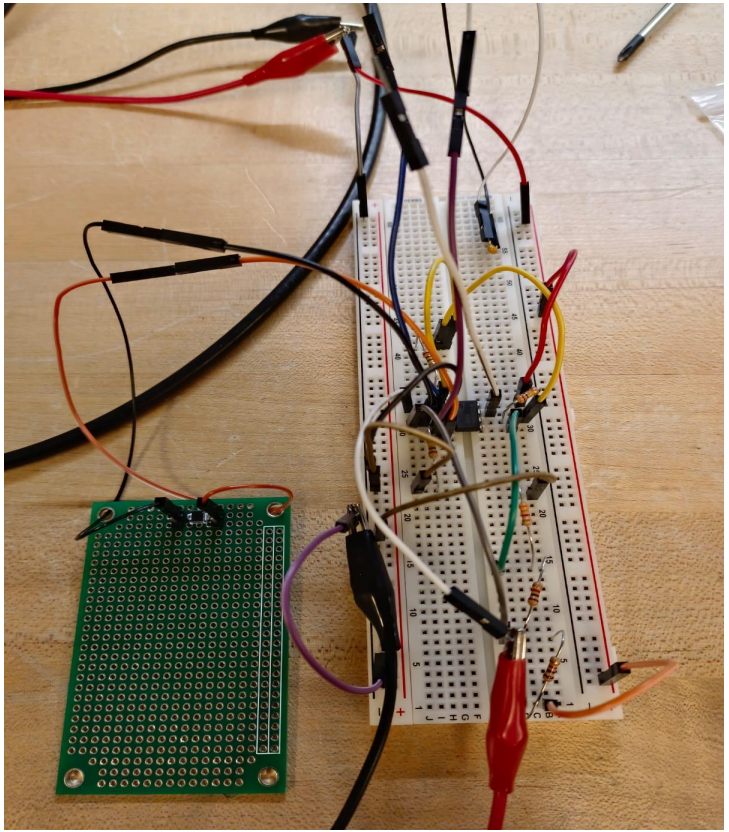

Circuitry Mounting (Vive + Driver/Control Circuit), Attacking servo in the front
Limit Switch
3 TOF Sensors Position changed to the sides
Motor Mounts
Cover circuits with acrylic casing

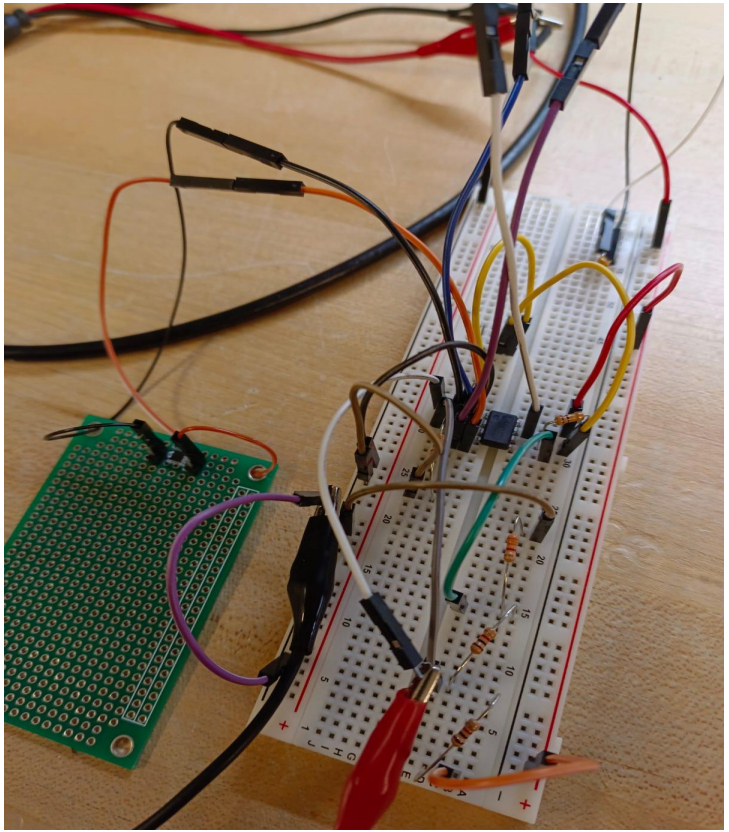
- Laser Cut New Mobile Base





- Tested Vive Circuit





Algorithm Overview

Our car is a 4 wheel skid-steer

The basic structure of our autonomy algorithm is

1. Implement occupancy grid
2. Generate waypoints between current pos and target pos
3. Implement no-entry zone that prevents us from attacking our side.
4. Initiate bug algorithm whenever we detect an obstacle to avoid obstacle.
5. Regenerate waypoints to target
6. Wall Following using ToF
7. Attack using rotating arm at the front of the robot

List of Components (Ordered All)

Component	Part Number	Quantity	Price
ESP32 S3	ESP32 S3 Development Board	1	$6.32
DC Motor	JGA25-371 DC Gearmotor	4	$17.12*4 = $68.48
H-Bridge	L298N	2	$6.39*2 = $12.78
Voltage Regulator	MP1584EN	1	$5.66
LiPo Battery	Turnigy 11.1V 3c	1	$14.99
Time of flight sensor	VL53L0X	4	$12.99
Op-Amp	TLV272	1	Ministore
Photodiode	PD70-01C IR	1	Ministore
Wheels	Mecanum wheels	4	$20
TOTAL	(+misc not added)		**$51.43**

Tentative Schedule

22 TODAY - Design Rev 1	23	24 Mobile Base Design Finalize	25 Vive Circuit Tuning	26 Testing	27 Design Rev 2	28 Consolidate Electronics
29 Order components	30	1 Hardware Assembly + Circuits	2 Hardware Assembly + Circuits	3	4 Controller Tuning	5 Wall Following Logic Imp
6 Robot Testing	7 Robot Testing	8	9 Graded Evaluation	10 Final Improvements Start	11	