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Design Implementations

Task 1 - Requirements

Functional Requirements:

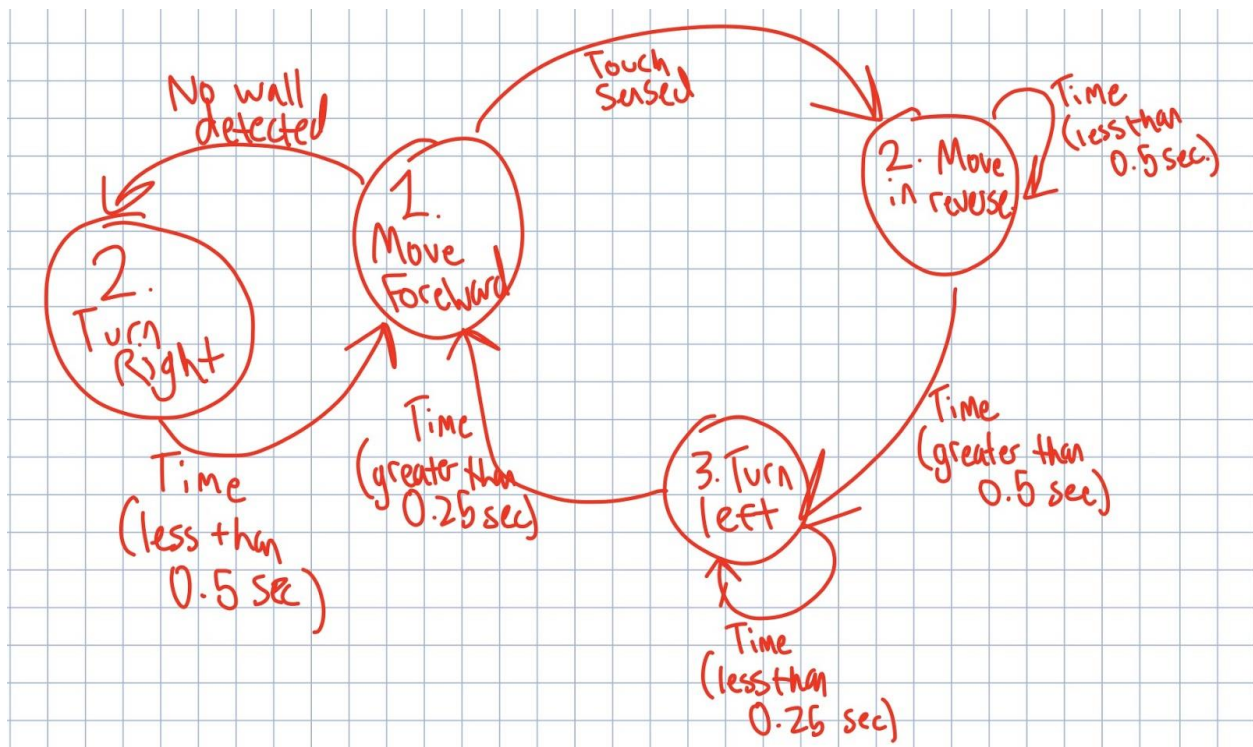
1. Traverse the maze autonomously. Pick the object and go out of the maze

Non-Functional Requirements:

1. If there is a stop sign, then the robot should stop
2. An autonomous mechanism to pick up the obstacle
3. The object should not fall

ID	Task Name	Start	Finish	Duration	Nov 5 2017							Nov 12 2017							Nov 19 2017							Nov 26 2017			
					7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
1	Design of the car	11/7/2017	11/7/2017	3h																									
2	Pseudocode for the maze traversal	11/7/2017	11/8/2017	6h																									
3	Implementing the code for basic maze traversal	11/14/2017	11/14/2017	3h																									
4	Test the code	11/15/2017	11/15/2017	1h																									
5	Include the Stop sign implementatio	11/20/2017	11/20/2017	1.5h																									
6	Test the implementation	11/20/2017	11/20/2017	1h																									
7	Implement the object pick up mechanism	11/21/2017	11/21/2017	1.5h																									
8	Test the implementation	11/21/2017	11/21/2017	1h																									
9	Final Run	11/22/2017	11/22/2017	1h																									

Task 2 - State Machine Diagram



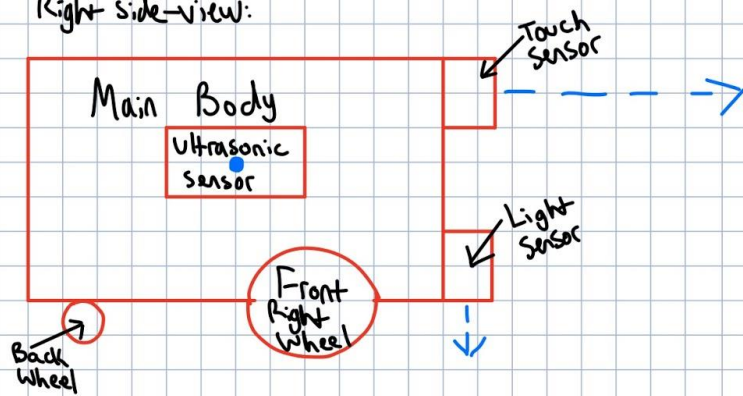
Prototype Sketches

Legend:

- Physical Layout
- Functional Direction
- Miscellaneous

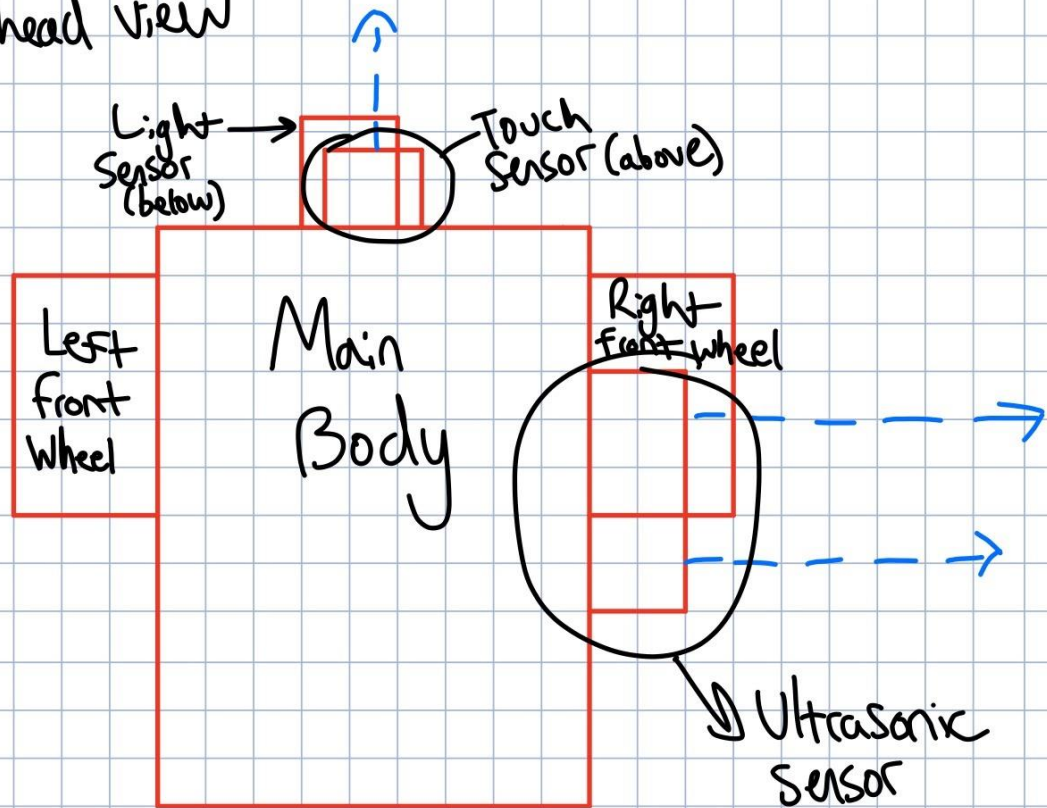
General Concept Sketch

Right side-view:



General Concept Sketch

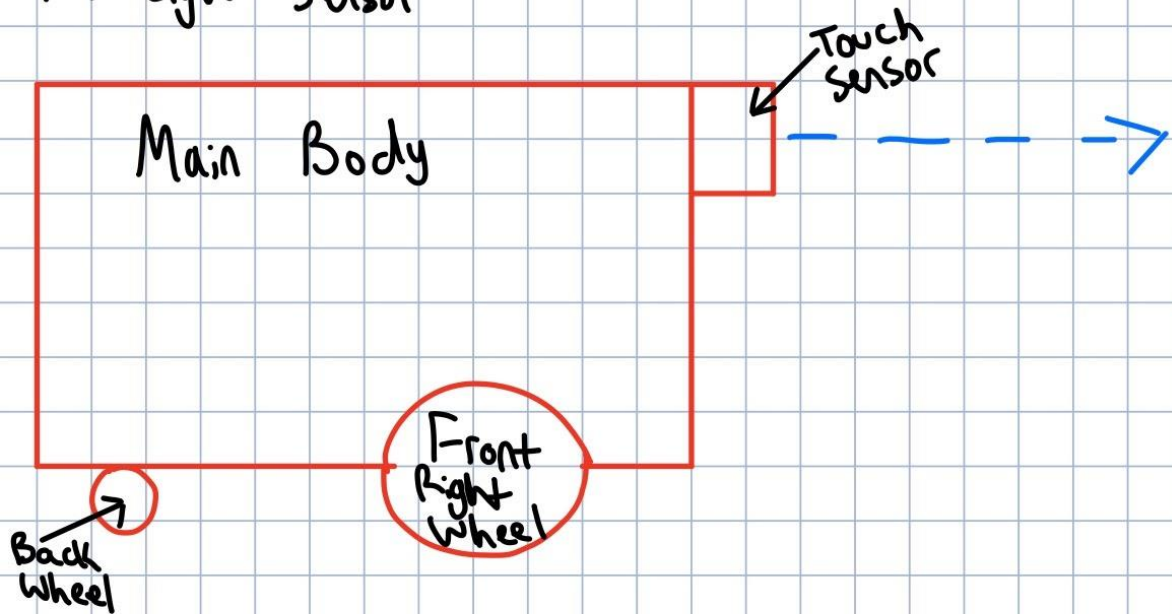
Over head view

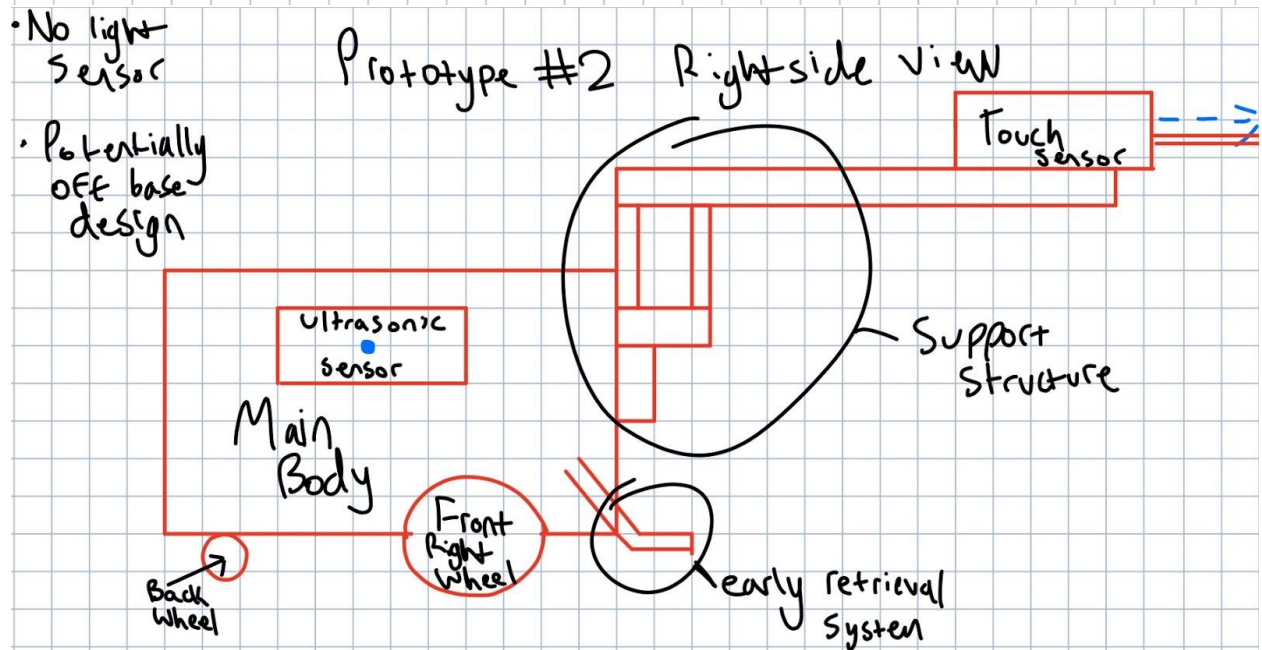
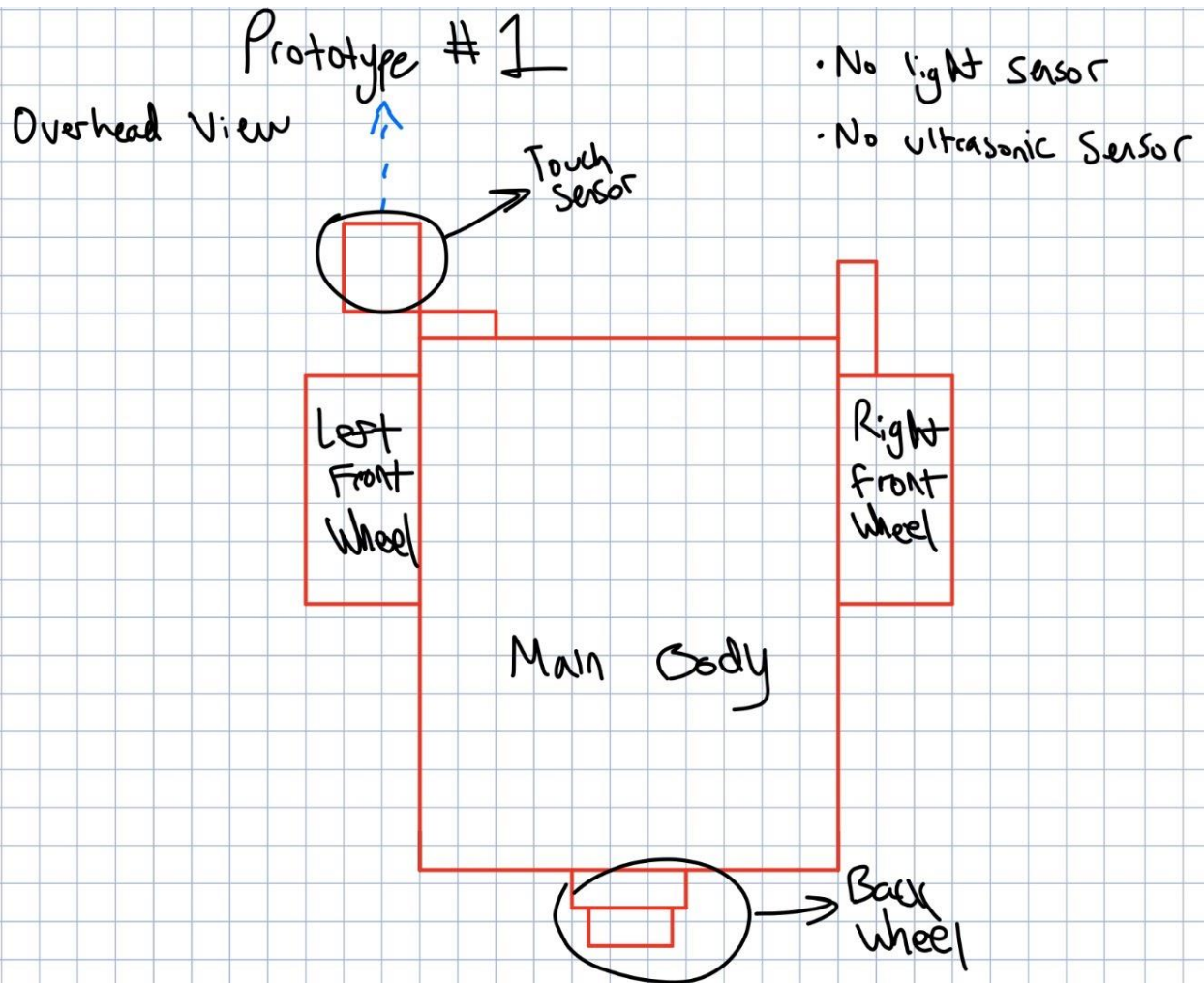


Prototype #1

- No ultrasonic sensor
- No light sensor

Right Side View





Prototype #2 Overhead View

- No light sensor

- Potentially off base design

Early retrieval system

Left Front Wheel

Right Front

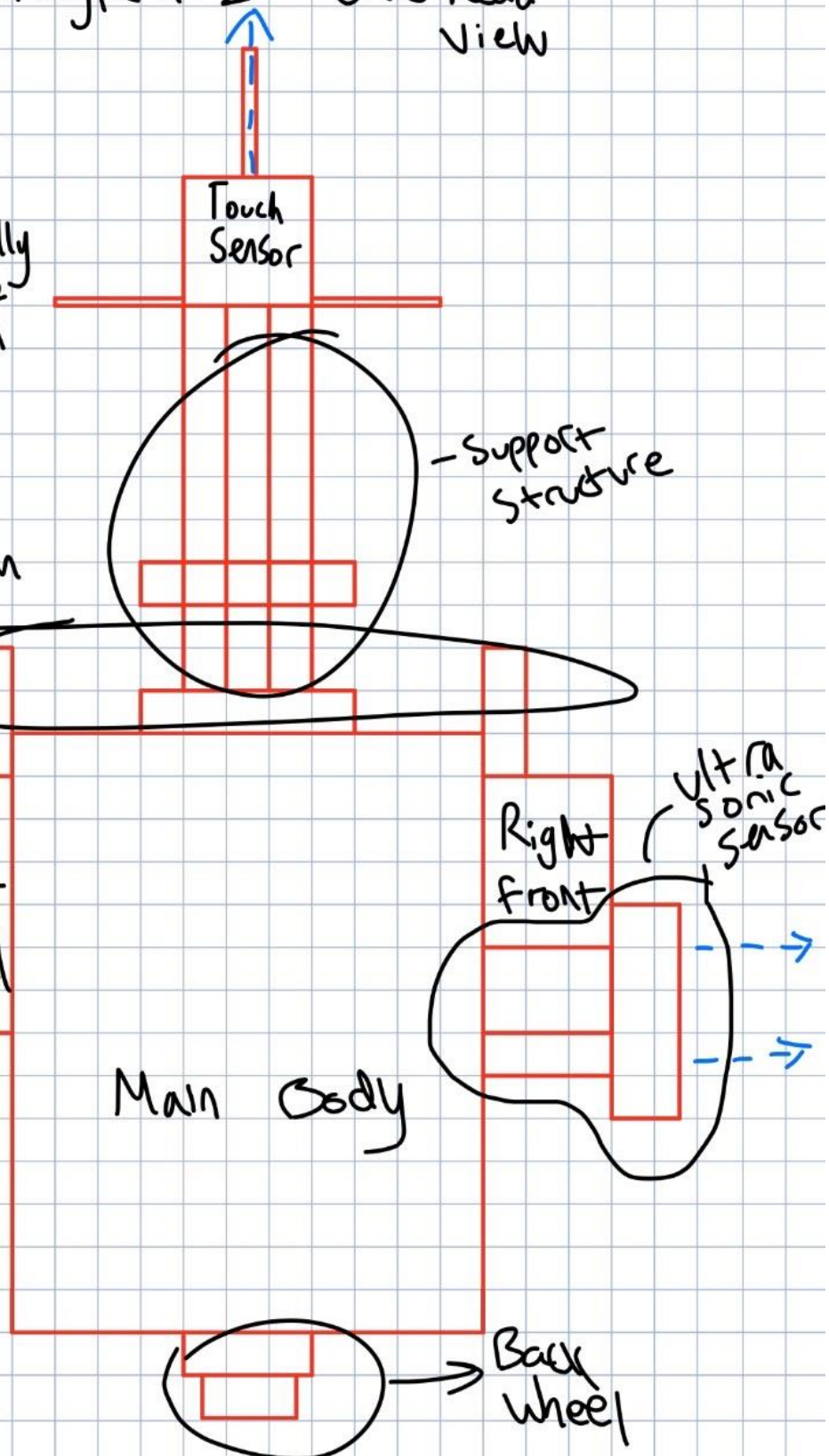
Ultrasonic sensor

Main Body

Back wheel

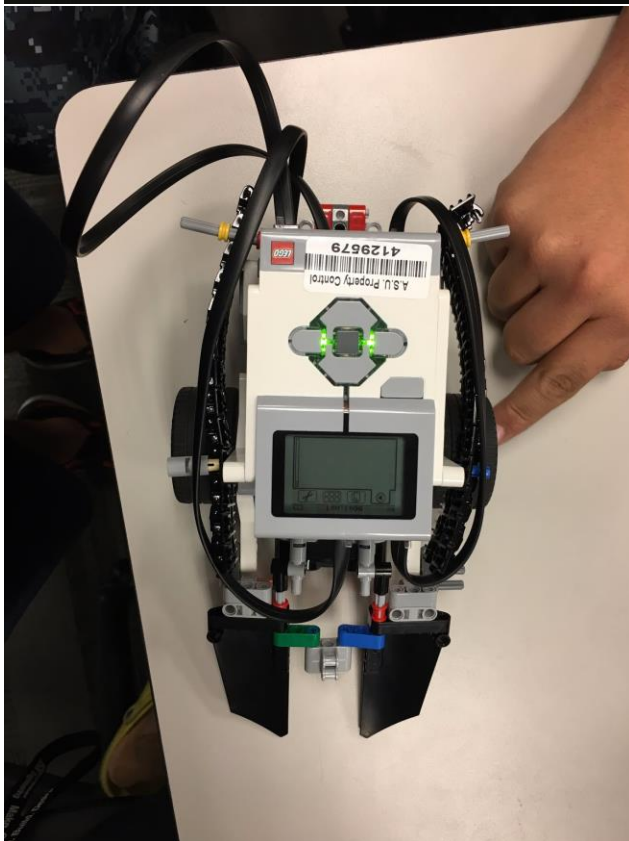
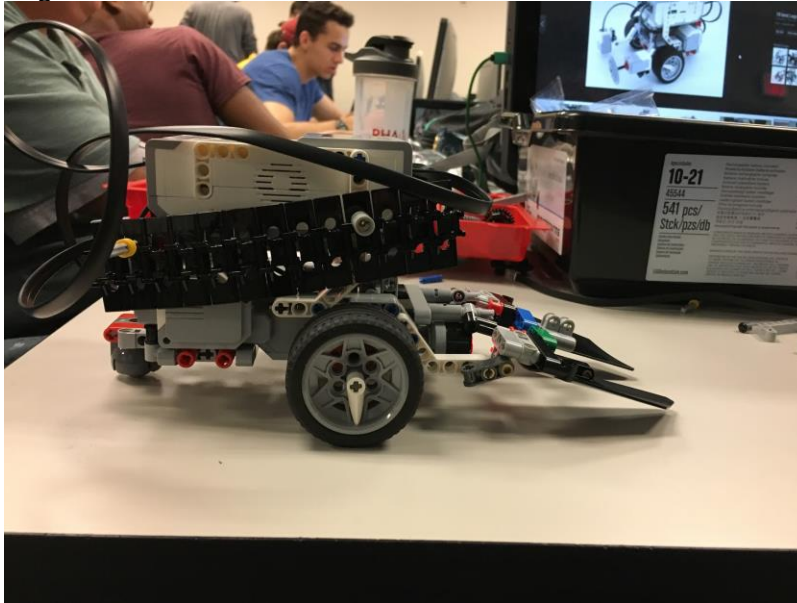
Touch Sensor

- Support structure



Final Design Implementation

The overall design principle is to scoop the other team's robot wheels and make them redundant. Thus it will be easier to throw them out of the ring easily. It has protectors on both the sides so that nothing can hook onto our robot and drag it out of the ring.



If another team has something to penetrate the inside of our robot then we can defend our robot because of the chainmail wrapped around it so all the inside is protected. This adds weight to the car and cannot be easily flipped over. We have added 2 shovel parts to the design so that we can stop the other team's wheels from moving forward or in any direction and the wheels become redundant. Thus we can scoop them away and throw them out of the ring

The main points of pride are :

1 Chainmail around the robot

2 Shovel parts in front of the robot to stop the wheels of other robots.

