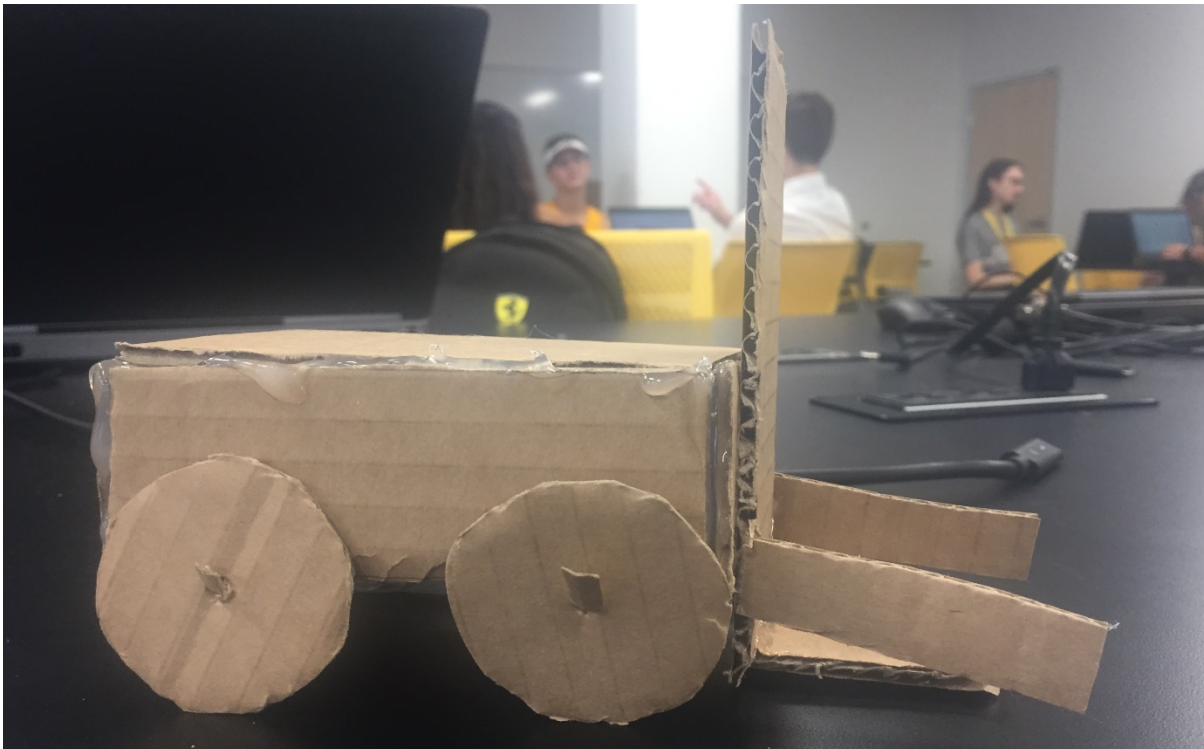


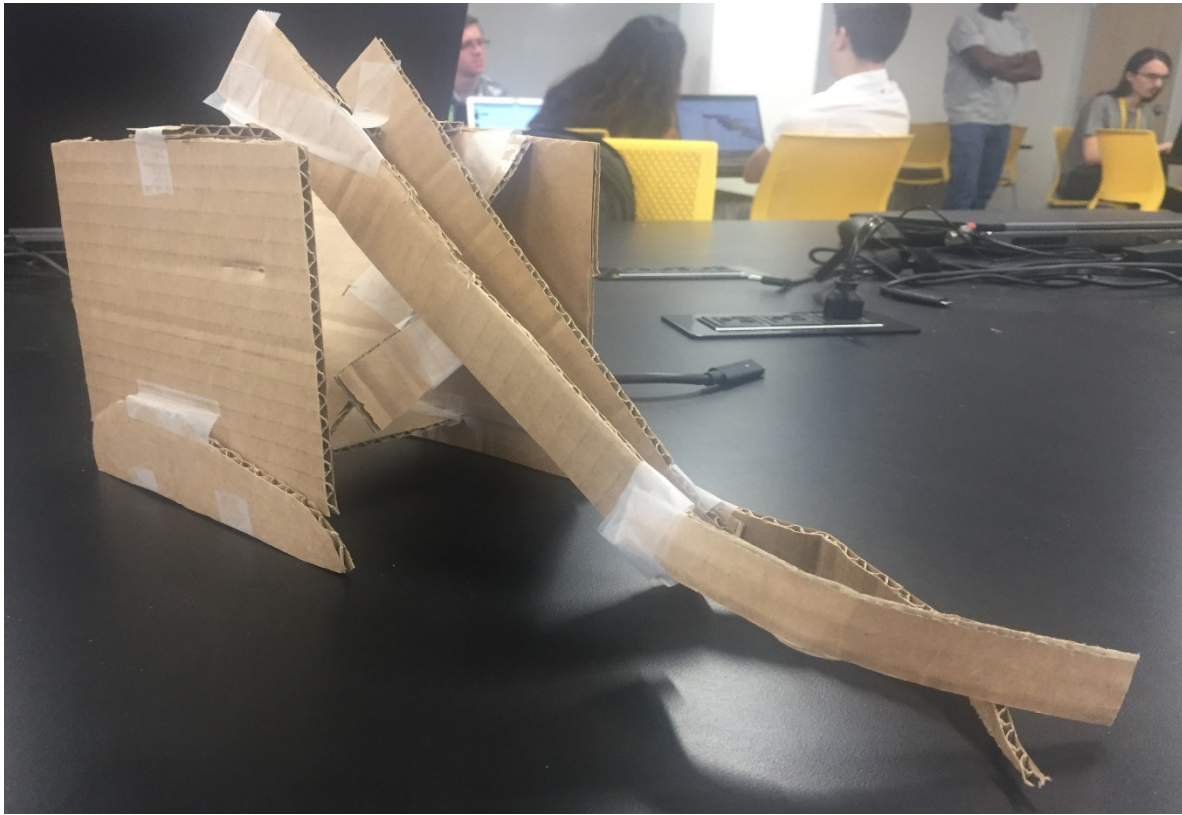
Wheels on Wheels Design Document

Design 1:



This vehicle was designed to keep the customer as safe as possible, while also making pick-up and drop-off as simple as possible. The flat base of the lifting system (which is similar to a forklift) will go under the wheelchair between the wheels to eliminate the possibility of being dropped and this also avoids the pushing of the chair away during pick-up. The claw then keeps the chair in place while movement is occurring, including the lift going up and keeping them in place when the vehicle stops due to stop signs etc. On the front of the vehicle will be the light sensor and distance sensor, the light sensor faces down toward the ground at a bit of an angle to detect colors on the ground and the distance sensor faces forward to keep the vehicle from hitting the walls. This car is made to do its job as efficiently as possible, as simply as possible, and as safely as possible.

Design 2:



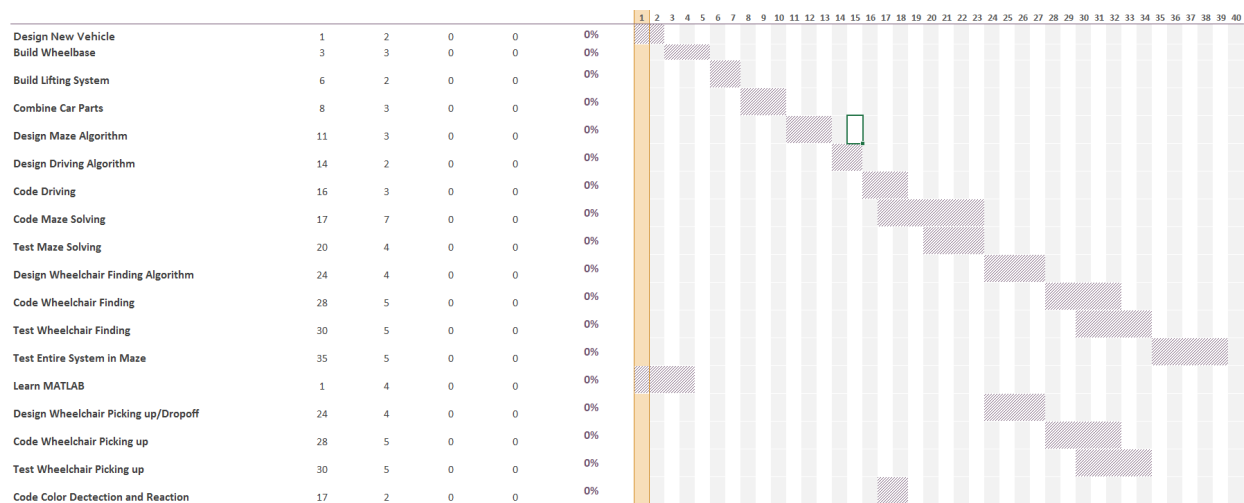
The 2nd prototype car uses a tank tread driving system to move around the maze. It has a claw gripping arm that grabs the customer and lifts them above the ground. The car has a poking arm that pokes at the walls on the right side of the car to detect a wall. It has a color sensor pointed on the ground to find colored strips in the maze and react to them.

Combined Design:

We decided to combine the two designs because each design had something lacking that the other made up for. The design is most like design two with the lift added from design one instead of the claw system. The final prototype car uses a tank tread driving system to move around the maze. It has a lift system that grabs the customer and lifts them above the ground. The car has a poking arm that pokes at the walls on the right side of the car to detect a

wall. It has a color sensor pointed on the ground to find colored strips in the maze and react to them. We plan to test out autonomous pick up and drop off though if it doesn't go as planned we will move on to remote pick up and drop off.

Gantt Chart:



Feedback Summary:

Project Manager:

Stated that we needed to add if we were going to do autonomous pick up and drop off so we changed that information in the combined design section. Told to add color detection and pick up and dropping off wheelchair in the Gantt Chart, changing the timeline slightly and making sure we added everything we planned on doing to the chart.

CEO:

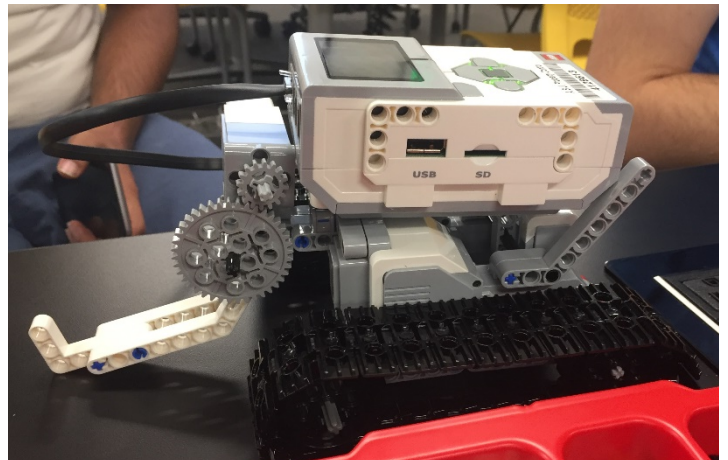
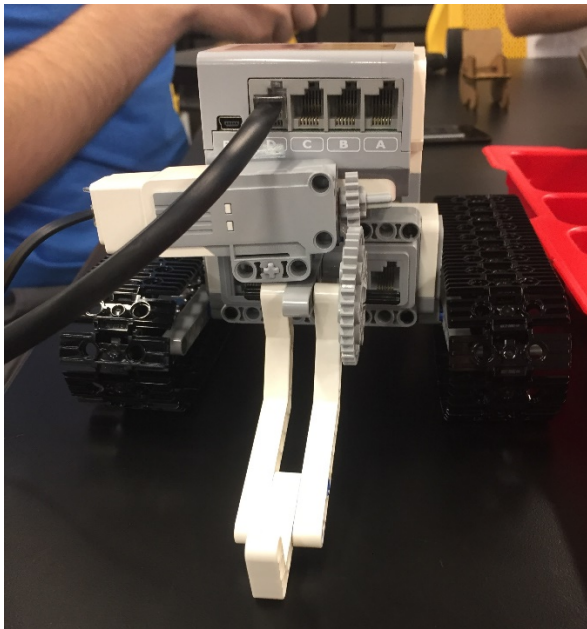
Just add Gantt chart to word document!

Implementation

10/5/2018 Day 1:

Today we are starting with the wheels and final design of the car.

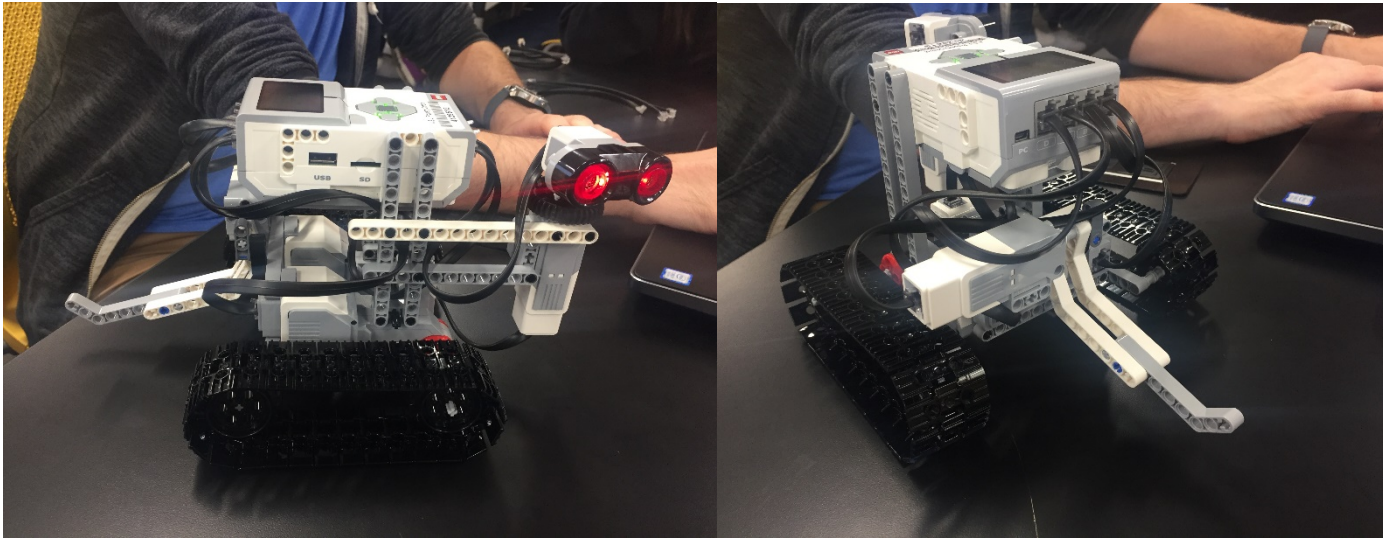
The type of wheels we've decided on are treads considering they use only a few motors to operate.



This is the design we have so far today. We have tried to create and test a lifting system that has not succeeded yet, we finished the wheel base, $\frac{1}{2}$ lifting, learned some MatLab, and final design is done.

10/12/2018 Day 2:

Still fiddling with the design to find the best location for sensors. Also testing to see if the current design works with coding in MAT LAB or not. We took apart the original design and revamped it to work better for what we needed.



We also started the process of creating a remote to control the car for pick up and drop off.

This week as a team we rebuilt the car and Eric programed while we watched giving feedback on what the car could and should do. Next week Eric will finish the coding for the remote while we learn mat lab coding for autonomy, aka sensors.

The Gantt chart has been updated with out finished pieces and is submitted as an excel document separately.

10/19/2018 Day 3:

Our goals of the day are to turn in remote control portion for Milestone 1, start working on autonomy and find a way to connect one of our personal computers to the Lego Brick.

So far today we have automated the distance sensors motor, downloaded an older version of MatLab onto 2 computers which one kinda worked and the other did not at all. So far we are stuck using the school computers to control the robot car thing and we are sad. This brick is being rude to us and not staying connect to literally anything. We finished the video and submission for Milestone 1.

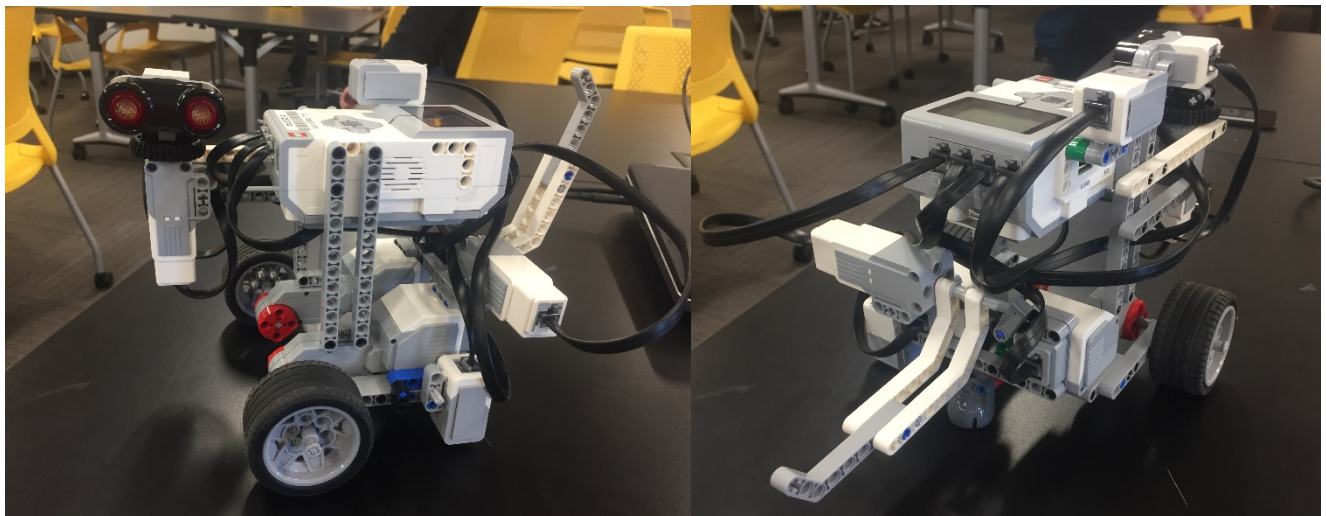
10/26/2018 Day 4:

Our goal today is to figure out the color sensor and test which one we would prefer to use. So far, we have decided that the RGB color mode will give us the most accurate values to have EVOO do what she needs to do at each color. We set ranges for the colors on a 360-degree scale. EVOO seems mad today, she didn't know what her brick was. 2 minutes later, still does not know what brick is. Now EVOO knows what her brick is, days are going well, I lied she almost drove off the table and is seeing ghosts. BUT EVOO understands red now and will stop when she sees it, Good Job EVOO. She can also tell if there is a wall near her though she stops then drives into it. EVOO is just a little dumb. EVOO is more than just a little dumb, she runs into walls and is annoying by breaking every two seconds.

11/2/2018 Day 5:

Today EVOO is being much more cooperative, we are working on the full automation of EVOO going through the maze. The issue that is arising is her confusion in some areas of the maze, because of this we had to change our algorithm to also scan the right wall, rather than our original left wall-based algorithm. The red lines on the ground are confusing EVOO, it makes the entire program freak out for a while. As well EVOO likes running into walls.

11/9/2018 Day 6:



This is how EVOO looks now, her final form. Today we are fixing the color sensor and possibly submitting our final milestone. EVOO likes to fall apart but don't we all sometimes. EVOO is very slow and hates colors, she may want to be color blind but we won't allow it. She is color slow and just generally slow... WHEN SHE WORKED LAST CLASS. We turned in milestone 2 now we are working on getting the color sensor to work at the same time.

11/16/2018 Day 7 Final Working Day:

Today is our last day working on EVOO she kinda sucks today not gonna lie. She is just doing everything in her power to concern us with our final product. She stops at stop signs on occasion but no longer runs into walls (as much), we think she will get through the maze if she doesn't flip herself over. She's doing a lot better now, and really appreciate that (until she messes up again).