9/30 - Matt

Today was the first day of 2020 robotics. After getting settled in teams, we developed ideas by looking at photos and videos of other people building robots built for this year’s game.

Personally, I noticed that a lot of the mechanics required for the game (as per the current meta) had been very similar to last year’s game, named Tower Takeover. In last year’s game, robots had to make stacks as well as drop blocks onto towers, allowing for a doubling or even tripling the score of a certain colored cube. After throwing that observation out during today’s meeting, we came up with ideas as to what we should be focusing on when building the robot. **At this initial point, I think we wanted a robot that specializes in speed, descording and defense abilities.**

2020/10/06 - Heejin Kim

We started planning by sharing ideas of how to make a Change Up robot. We watched some videos of similar robots that other people built previously to find out ideas they have put and several robots that have worked well. One of the videos we have watched is 10955M change up robots, and we realized that using vertical intake helps balls go upward easily. Since we are focusing on speed, defense, and scores, we came up with the conclusion that using vertical intake is better than intake that is directly moving upward because when this is moving, it takes longer time to carry balls to the tower. To sum up, we are still finding ways to defend well from opponents and see how to shorten the time of balls being carried.

2020/10/7 - Sejun Park

Now, we have decided which type of robot we are going to build, my team members started to build the chassis with 4 4” omni wheels with 4 motors: 2 motors on the left, 2 motors on the right. While building the chassis, we also decided to use 2 motors for the vertical intake and another 2 motors for the horizontal intake, because we thought that it will need a lot of power to lift up the balls using the vertical intake and 2 motors for horizontal intakes because we are planning to use 1 on both sides, just to give the intakes an equal amount of power.

We have designed our basic model of the robot, I start to write a few codes mainly with 3 parts: pragma, basic functions, and user control. For the pragma, I simply defined 8 motors that we are going to use, and gave the port number where the cable will be connected to the brain(It is a temporary set up, so it will be changed based on the build).

Then I made 4 integer variables, each one representing one of the Axis1 to 4 values. I also built some void functions to help my coding a bit more easier. One of the things I have done is that I grouped the motors doing similar functions to have the same value of power in a single line rather than having multiple lines making the code more complicated.

Next, I wrote the code for the user control in 3 different parts. The first part I made is a basic chassis control. Our driver wanted to test it out both arcade and tank control, so I made both of them. Then I made an integer called “option” and I made it so that the driver can change the chassis control by simply changing the number of the integer “option”. Then I wrote another code for the intakes. I made it so that the robot intakes with 100% power when the diver is pressing the L1 button and outtakes in 100% power if button L2 is pressed by the driver.

Finally, I made one optional thing which was a power control. I wanted to make an option for the driver to control the robot more precisely through slower movement then default. I made a float variable called “change”. All the values of the chassis motors are written Axis value x change. On default, the change is equal to one, which means that the motor runs in an axis value. However, when the certain button is pressed, the “change” value changes to 0.7, which makes the motors allow power up to 70% of the current value of the axis.

2020/10/09 -Matt J.

Today… Well, today was very slow paced. While we did work on building the chassis, I mostly observed today’s building, even though I’m in charge of the design and build process. I was pretty burnt out the whole week but I still wanted to commit to robotics today. Even though I wasn’t motivated to work on building, I decided to figure out how to build the intake. Based on what I saw, a lot of people had an intake where balls are taken in front of the bot and released also on the front, but on top. Initially, I thought we could make do with having the rotational speed of the outtakes as the same speed, but somebody introduced the idea of using a flywheel to me. I joined last year when Tower Takeover was introduced, so I wasn’t around to learn how flywheels worked. I looked up a couple of videos on it but I still have a bit of trouble understanding the mechanics. From what I understand, a powered intake is connected to an unpowered intake via chain link.

2020/10/14 - Heejin Kim

Today we focused on fixing our robot to make it become more stable. We tried finding ways to make the tires become less loosen by adding spacers and washers on the driveshafts. Since we realized that some of them were bent, we tried finding ones that are not bent to make the tires move smoothly. We also changed where to put the middle c-channel that holds two c-channels so that it can do a role of both holding them and making four tires have enough space. While we were making some spaces, we also moved the bearing flats back. Another thing we realized was that one of the bars that are placed on the inside part were screwed on the opposite way, so we flipped it to make all of them face left side.

After these processes, we planned to test driving on Friday with two variations:

1. Two motors in the back
2. One motor in the front, One motor in the backx

10/20 - Matt (Draft)

A lot of progress had been made today. Until today, our progress had been painstakingly slow. But one of the captains from the other teams came by to help us finish today’s chassis. We’re planning to test drive the chassis tomorrow, because I have yet to decide if I want to drive a (whatever you call 2 motors in the back per side) robot or an all wheel drive robot. Chances are if I’m going to drive with 4 motors in the back, I’ll want to learn how to be proficient at tank drive, as last year I only used arcade drive since it was a very familiar way to drive for me.

2020/10/23 - Heejin

Today we focused more on giving ideas than continuing with building. Since the ball’s diameter is 16.5 cm and our distance where balls go in is 16.2 cm, we decided to attach two 45-degree gussets in order to let balls go in smoothly. Adding to that, we also decided to attach anti-slip mat between the space (16.2 cm) using zip ties. Between the two c channels (below the anti-slip mat), we chose to attach the standoff to make that part become more stable. +

2020/10/27 - Matt

Since I wasn’t here on Friday to contribute ideas for the intake, I asked Heejin and Sejun what ideas they had. Our robot is not as wide as the other robots, so one of the ideas thrown around for the intake was to make what I think is called a step up intake, where the first intake is lower than the second. However, it’s built vertically, which is why it’s called a step up intake, rather than a vertical intake.

We started by determining the standoff height as well as the length of the lower piece. For this, we first used a 1.5 inch standoff accompanied by a 5 x 3 wide c-channel. When we put the cog under there to test how well the intake would work, it didn’t work well, so we had to extend the height to 2 inches. I think that height worked, pretty well, but it took longer than I expected to build one. For the next meeting, we need to build the second step. From there, we can determine what we need to fix, since I don’t see a clear problem yet.

2020.10.28 - Heejin

Today we focused more on building the intake. We did not attach the gear yet, but we attached many standoffs on each side of c-channels around the middle. Above 4 standoffs, we attached another c-channel to attach another 4 standoffs. Between the two c-channels, we also attached another c-channel perpendicularly so that the gears can be attached on them.

We started attaching gears under the two c-channels that we attached perpendicularly to other c-channels. To make gears move by V5 smart motor, we used standoffs, collars and some spacers to connect them. It was hard to find the right length of standoffs because we had to find one that does not make gears to touch both the c-channel above and the wire below. Our plan is to attach other gears on the other side of c-channels (front side), and connect two gears on the same c-channel with one long chain.

2020.11.11 - Karin

Today we worked on improving how well the intakes intake balls, and stabilizing them. We first attached anti-slip to the standoff that runs across the middle of the chassis, which would help guide the ball into the robot. When we first tested it out, the ball would take a while to grip onto the anti slip and slide in, so we decided to lower the height of the middle standoff. We did this by adding ¼ inch stand-offs and spacers under the pillow block. Additionally, we stabilized the intakes and prevented it from moving by attaching a standoff on the chassis and screwed it onto the intake. Because the intake was one hole off from where the standoff was, we came up with the solution of using a collar to connect the standoff and the intake. After changing these things, we tested the intake and it took in the balls much more easily.

11/14 2020- Aisha

For today's meeting (11/11), we tried to rebuild the intake so it would be more compact. The previous intake took a lot of space so we decided to move backward so it would take a little space.

It was pretty challenging to reattach the parts but we finished reattaching everything. Attaching the spacers and fitting in the screw was hard work. In the process, the spacers and the screws did not fit correctly and they were very loose. So we tried several times to attach these. Our next task is now stabilizing the intake and plan for the upper part of the robot.

11/17 2020 - Heejin Kim

Today we focused on fixing c-channels to make the two c-channels that connect to the geers more stable. We realized that if those two c-channels are more stable, then the ball will go in smoother. Before we fixed them, we put each of them between other c-channels (5 holes each) with screws, spacers, and washers. We also attached several standoffs below and next to them. However, we instead decided to attach the two c-channels to c-channels that have 5 holes. This means that we took out the spacers and washers, and found shorter screws to attach them. We are still discussing the design of the intake, and also where to put the brain.

11/24 Aisha Oda-

For Thursday’s Robotics, we repaired parts such as the C-channels and the place to put the brain. We also focused on building the intake and stabilizing them. In addition, we decided to build the rollers and attach them to the intake. We finished building the C-channels or the basic structure of the intake The rollers are based on other team’s and they are created using gears, screws, couplers and standoffs.

Monday notebook - Heejin Kim

We attached four C-Channels vertically to make the intake. However, since they were attached vertically, they were not stable enough, so we decided to attach some stand-offs in order to connect the two c-channels each on the same side. Firstly, we used the two collars and a nut to make two holes that can connect c-channels and stand offs. After attaching one of the holes to the c-channel with the screw, we extended the stand off by using shorter standoffs and spacers with short couplers. After attaching them, we connected it to another c-channel that was on the same side. After this process, we could observe that this helps c-channels for intakes become more stable. c