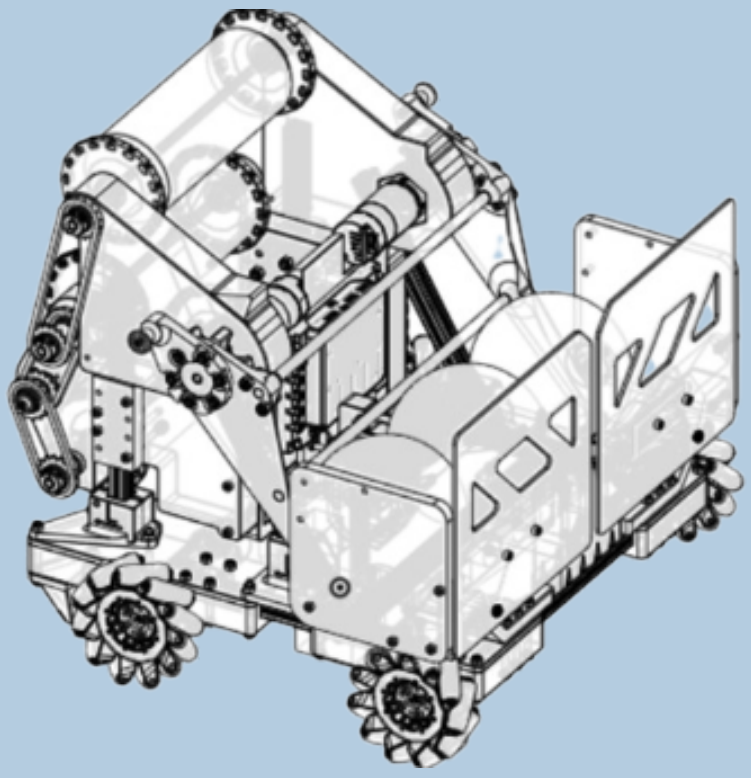
WOLVES ROBOTICS

Wolfpack 5661

DECODE

2025-26



DECODE

PRESENTED BY RTX

FTC

FIRST® Tech Challenge

WHO WE ARE

OVERVIEW

We are team 5661 Wolves Robotics Wolfpack located in Goodyear, Arizona. We work alongside our sister team 7156 Wolves Robotics Puppack.

GOALS

This season, our biggest goals were to spread robotics throughout our school, and to refine our major skills in CAD, 3D printing, and leadership.

WHAT MAKES US UNIQUE?

What makes us unique as a team is that we are not just a robotics team in our community; we are a part of our community. We do multiple different forms of outreach to build up our robotics team.

HOW DO WE CONNECT?

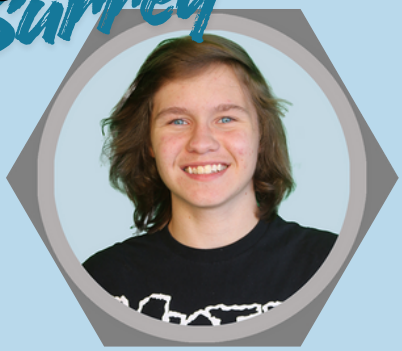
We connect with our community by supporting future STEM leaders, engaging in community service, and leaving behind a positive mark to last.

OUR FAVORITE ACHIEVEMENT

If we had to choose one thing to be our favorite so far of the season, it would be spreading FTC around the school and bringing in an array of new members

MEET THE PACK

SHAWN Surrey



Senior -4 years in program

I'm planning to make the most out of my last year in FTC by taking others in and spreading robotics

CARSON Phillips

Senior -4 years in program

I'm planning to expand my CAD skills and team leadership skills.

LILLIAN Manning

Senior -1 year in program

I am planning on developing my coding skills and my resume.

Future Sustainability

As a smaller team, we have worked hard with our school and Mr. Matteson to ensure the sustainability of EFHS robotics. Firstly, At the beginning of the year we held a future freshman night to encourage incoming freshman to join robotics. This, in part, led to the success of recruiting a full fresh set of members for our sister team 7156. Those kids have now fully invested into robotics club and show up weekly to design and learn. They will then take our spot next year in 5661 and bring new members on to keep the club going. On an even earlier note, we also ran the robotics side of Steam Camp at one of out K-8 feeder schools. This class that they were able to partake in for a whole week excited children of all ages to invest into robotics as a whole. Additionally, we have helped to form and heavily contributed to the new robotics class that is at our school. This program with two levels will allow students to learn and get excited about robotics within and without school hours. We understand that our program rests in our hands, and thus we have made the greatest effort to make sure the people we have brought in have been engaged and mentored thoroughly. By ensuring sustainability, we will have a team for many years after we leave.

MENTORSHIP

LUIS Valledor

JAMES Bennett

BADEN Armstrong

We have a series of alumni who are more than willing to dedicate more of their time to our team. They have helped us through learning how to manage a smaller team, lead younger members around chaotic moments. James Bennet has been a big mentor to our coder, Lillian, when it came to inputting our code onto the control hub. Luis Valledor has mentored us through the making of our portfolio and taking new approaches to our bot. Our mentors have been more than helpful to us as they pursue their degrees in college.

GAME PLAN

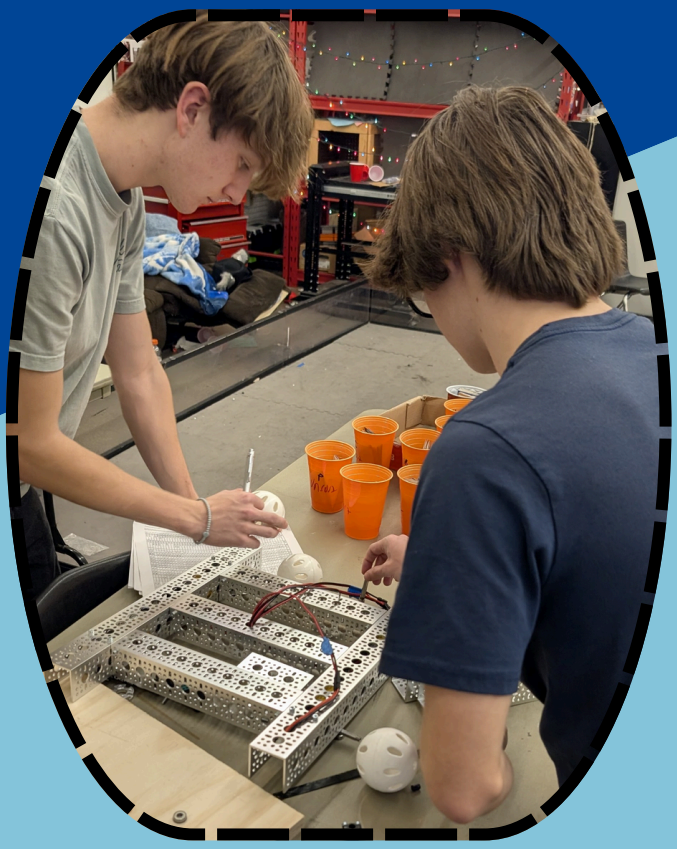
Our Plan

After the loss of many members last year, we have made an effort to not let that slow our team down. 5661 has implemented personal goals for each of its members to keep us on track:

Shawn Surrey: Grow a greater understanding of CAD and 3D print technology.

Carson Phillips: Practice with different building methods and develop team strategies

Lillian Manning: Learn code and how to implement it onto the bot to change a design into a creation.

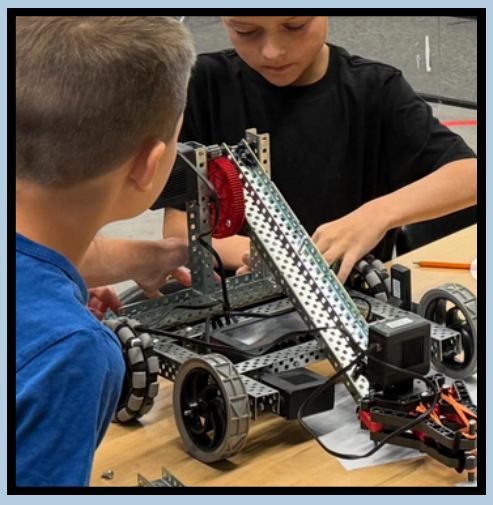


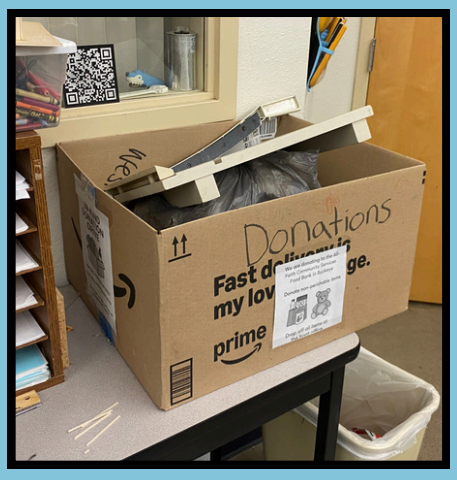
Finances

Generating money is essential to the working of any robotics team, and while we continue to search for sponsors, we are working with our school to provide concessions. These not only support our club financially, but support our schools overall athletic program. Outside of school finding, we have a Booster Club run by a parent supporter which allows us to bypass the PO system for smaller club purchases. Together, these and smart spending practices ensure our club always has the funding it needs to function

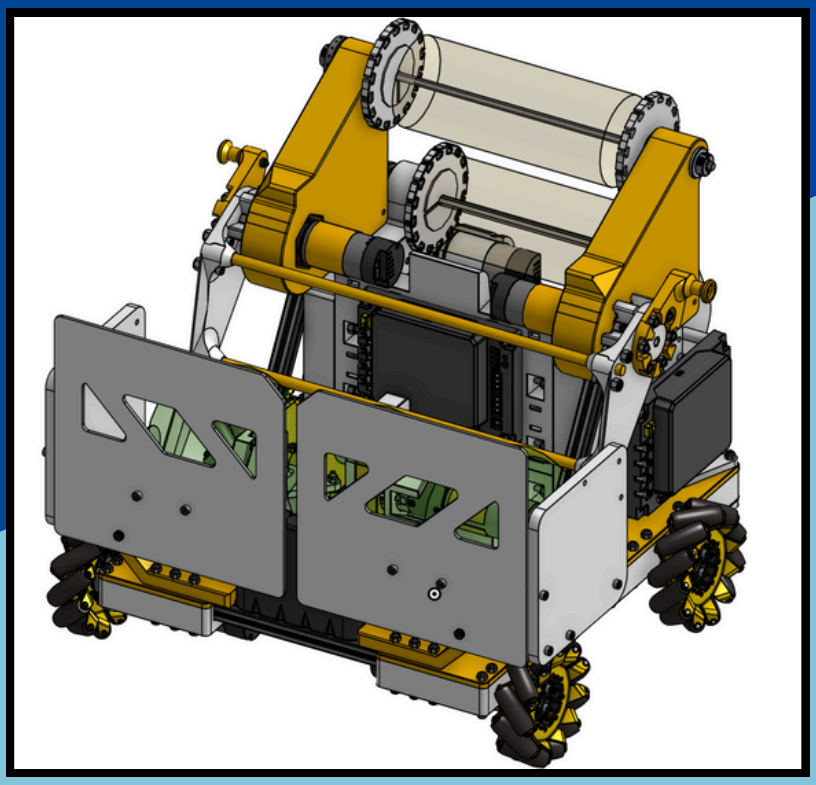
OUTREACH

As a team, we engage in various activities to connect with our community. The 5661 and 7156 teams do a Steam Camp each summer for kids in the age range of kindergarten to 6th grade. Kids during Steam Camp learn how to build maneuverable robots, which that then be used in our own mini competition. In this competition, the kids are asked to make a robot that can pop the other team's balloon. We as a team have also done a number of different food and water drives to help better our local community. We did a water drive that went to Andre's house of hospitality, collecting 950 water bottles! We also partnered with All Faiths to donate over 75 pounds of clothes in only one month! We are also now running a dry and canned food dry parnterning with All Faiths again.





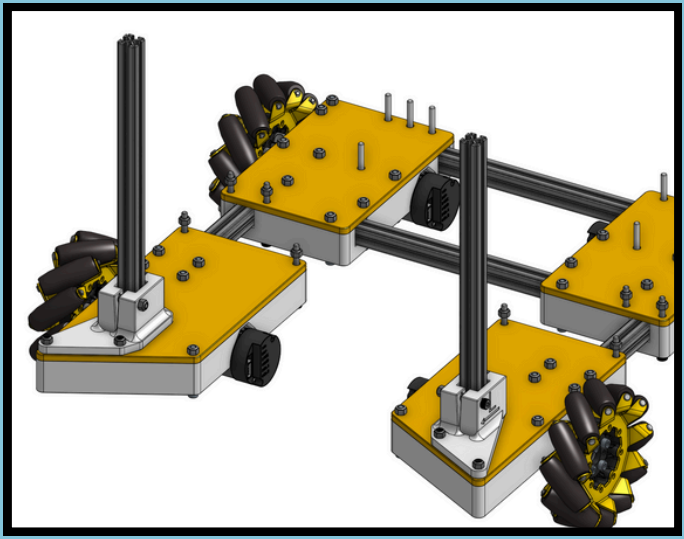
ROBOT OVERVIEW



The EveryBot
by
Robonauts

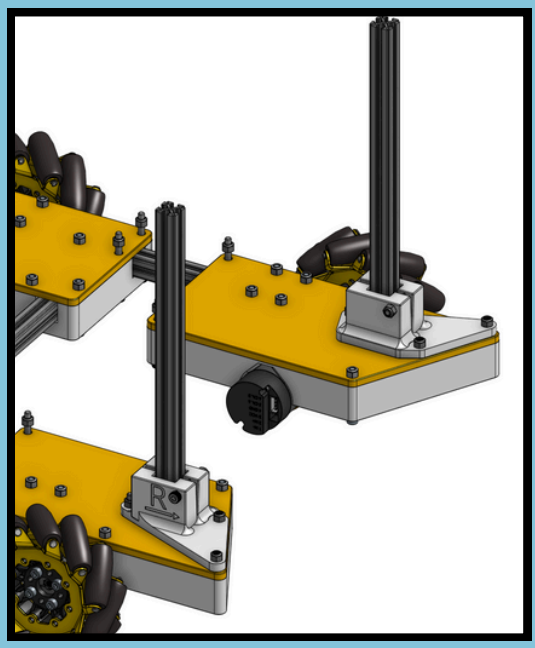
As competition came closer and closer, and our two main builders were highly limited in the time they could spend designing, the reality of our situation was realized: we would have to use another design for our bot. Luckily, team 118 Robonauts had a design just for this purpose! With our knowledge of 3D printing and a strong desire to work hard to keep our team in the game this season, we printed, built, and coded the robot in just 10 days. With the question of what our design was going to be answered, we shifted our focus over to learning everything we could about this design and using its genius to launch off from. We designed our own gears and adapters to use the materials we had while keeping the overall function of the bot. With this base, our driver can get practice on the field while we craft our eventual future design. By next competition, we are striving to have a completely original if not much improved upon design that can individually fire, strafe and drive with precision, and score high points in autonomous. While these goals may be difficult, 5661 intents to continue working hard to overcome the difficulties of this season, and have a bot we can truly call our own.

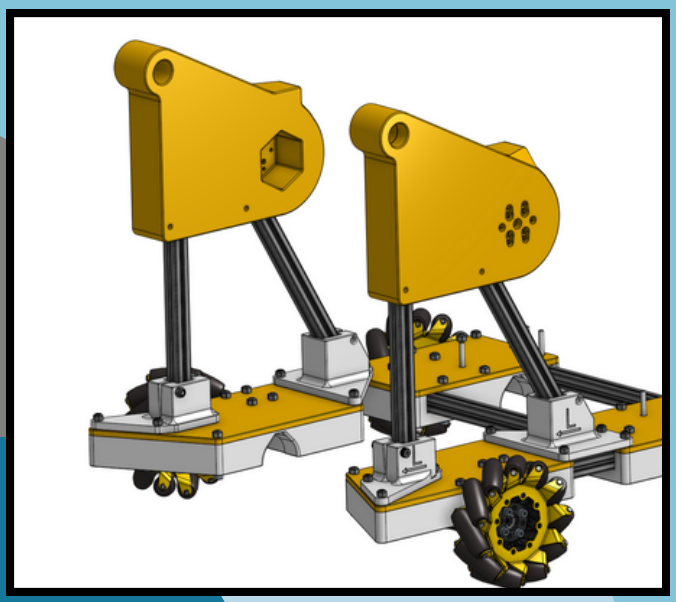
CHASSIS & SUPERSTRUCTURE



Our chassis was unique in its design as it did not rely on a full metal structure, but a mix of 3D printed clamshells and the REV 15mm shafts they held. Because of the relatively low weight of the full bot ≈20lbs this system worked well. The motors were mounted with a mix of 10mm bolts with 8mm washers and ¼" zip ties which wrenched them to the frame.

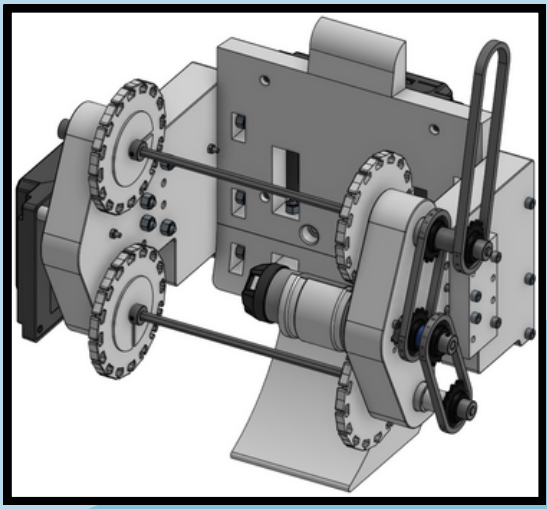
The overall superstructure is simple and easy to expound upon. Four 15mm rex shafts, each 225mm long, are held by 3D printed clip bolted to the chassis. This allows for a flexible system that allows for bending before breaking, but is also solid enough to produce reliable results. In our future designs, we hope to create a system that, just like this one, is easy to disassemble and reassemble at a moments notice. Ensuring repairs and additions can be added smooth





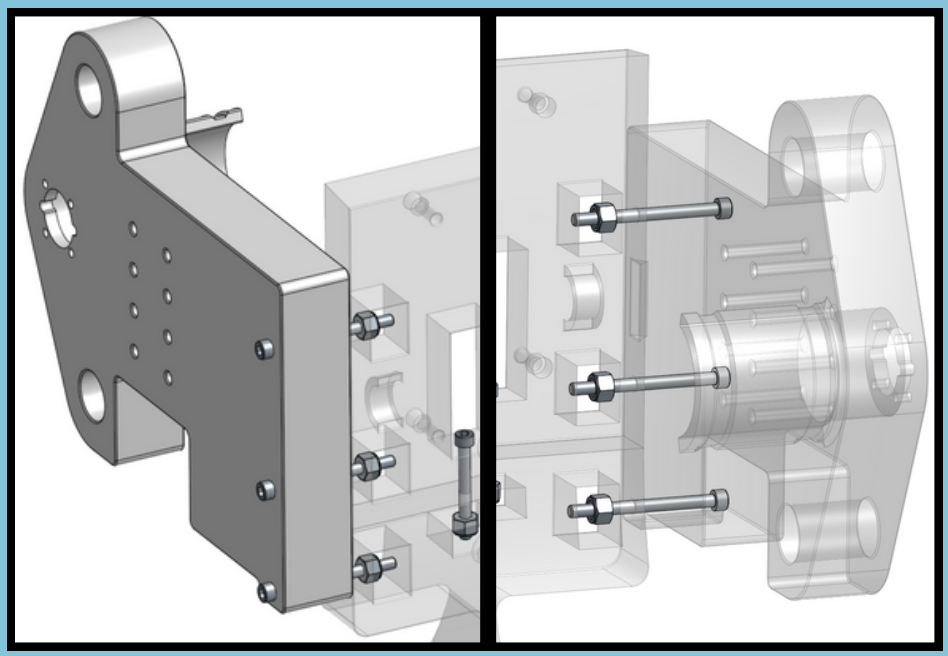
The final pieces of the bot are the pivot structures shown in yellow on the left. These structures are held up by the REV shafts and provide support to both the catapult motors and the final wheel of the intake chain. These were the hardest elements to print as they had support filament on the inside of the cutout for the REV shaft, though this bot was fairly easy to print as a rule.

INTAKE

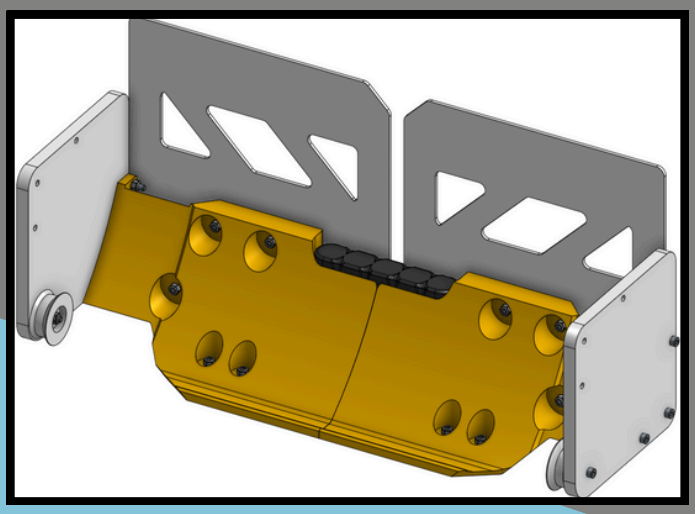


The most intricate and the most interesting part of our bot is the intake. The backbone of the intake is made up of two, 3D printed plates. The bottom backplate of these has a ramp that the artifacts travel up whereas the top backplate has a slot for the two GoBuilda motors of the catapult as well as . Attached to this are two side plates, housing the expansion hub and a GoBuilda 5203 series motor respectively. This motor then spins up 2 sprockets connected to the drivetrain of the intake. The drivetrain itself uses and additional 4 custom sprockets as well as VEX chains to rotate 3 axles. Connected at either interior end of these axels are wheels with slots for rubber bands, chosen for their ability to provide strong grip on the artifacts while forming around the round surface.

All of these individual systems come together to create an intake which can funnel the 5" diameter balls from ground level to 18" in the air in a matter of moments. Powered by only one motor, this intake is cheap and easy to fix/improve. Not only that, but limited total parts equals limited parts to possibly fail. From here, the artifacts fall into the hopper ready to be launched by the catapult. We hope to innovate upon this design over the next month.

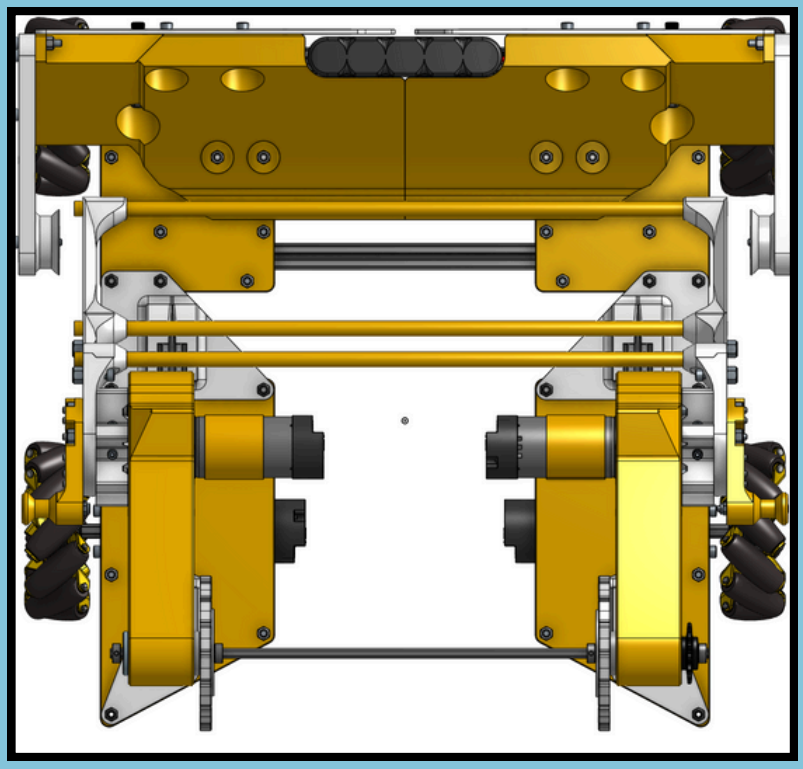


HOPPER



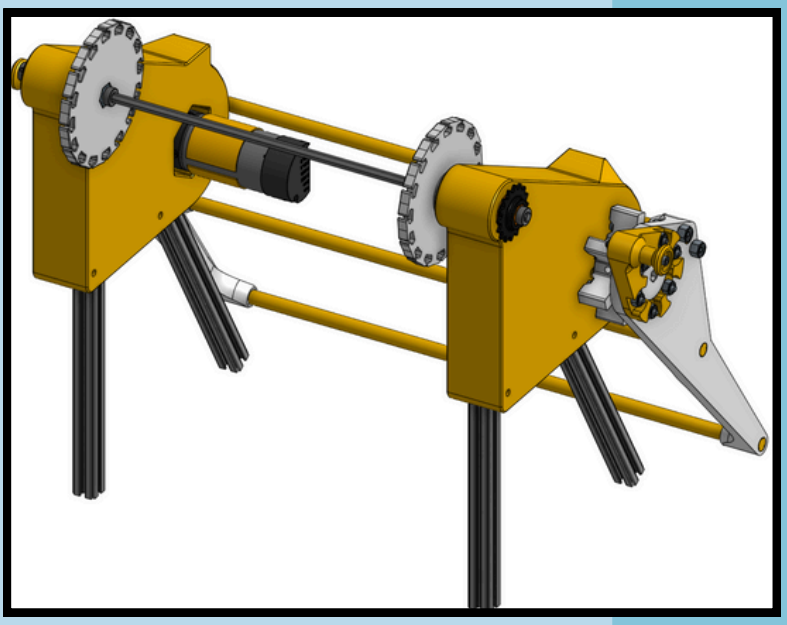
The hopper could be considered the simplest part of the robot, but nonetheless important. Made of 6 parts, the hopper stores up to three balls to be fired at once. It also stores the battery for the robot in the back. The main utility of the hopper for our specific bot was its side walls which allowed us to attach stickers to the side, such as our team number and logo. The final removable piece, the alliance marker, was placed on the pivot hub.

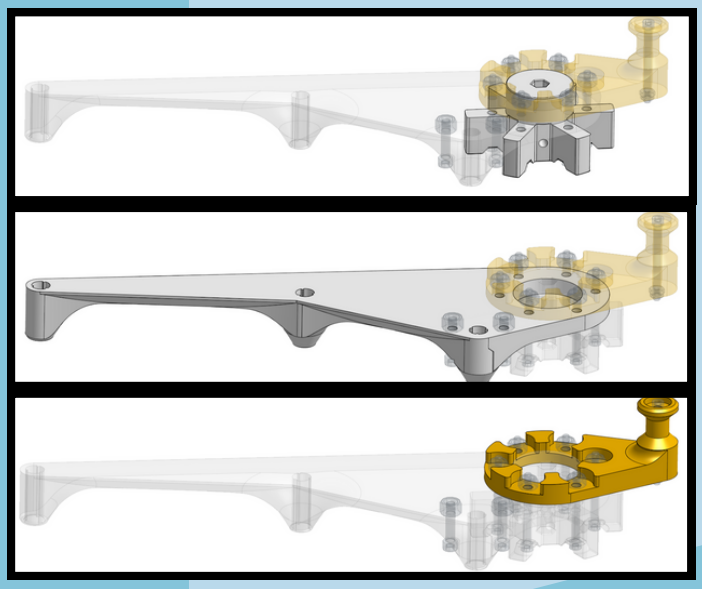
In the future, we plan to add an ability to fire just one or two specific artifacts at a time. Possibly using servos mixed with strong driver practice. Additionally, we plan on allowing the hopper to fit GoBuilda batteries instead of the REV batteries. This is in large part due to our mentors' experience with REV batteries and their inability to hold a strong charge over the duration of a match. Finally, changing the side panels to have our team numbers and/or name integrated within them would be a great addition.



CATAPULT

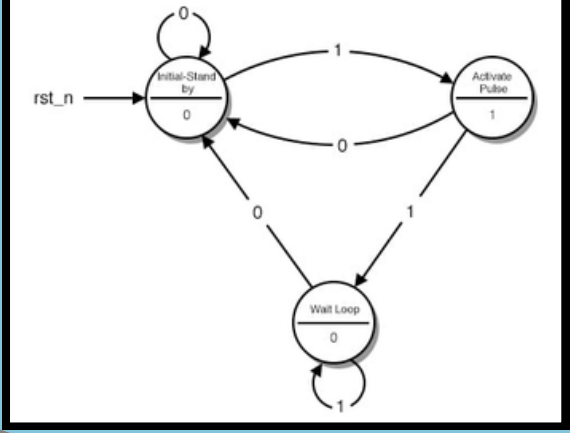
If any part of our bot could be considered make-or-break, its the catapult. Too much or too little force and 5661 is unable to score points through the round.
The catapult works off of 3 main parts on each side connected by fiberglass rods. These parts being: the pivot hub, the catapult arm, and the rubber band anchor. The pivot hub works as a intermediary between the GoBuilda motor and the rest of the catapult holding everything in place as it spins. The arms house the fiberglass rods and are the structure of the catapult. Finally, the rubber band anchor allows us to alter the tension on the catapult and tune our aim.





As the catapult fires, it hits a hard stop at the top of the pivot structure. From this, the ball is launched forward by the sudden stop. As we move through the next few months of competition, our goal is to devise a way to launch the balls individually as mentioned before. However, if a servo is not used, possibly adding additional arms or otherwise manipulating the catapult would be the path. We have had first hand experience with disassembling and reassembling this section of the bot, thus we know the relative ease in which changes can be made to this assembly.

CONTROL SYSTEMS



While we do not yet have control systems, we have three we wish to add in the coming months. First, an odometry pod to tell us where the robot is at all times and enhance our autonomous. Secondly, a camera and/or color sensor to also assist our autonomous systems by reading QR codes. Finally, a finite state machine in the code would allow us to test individual parts of our autonomous without running through it in its entirety. All this being said, these control systems are only useful if we have an autonomous for them to assist. Within the next few weeks, we are designing a position driven autonomous to shoot 9 artifacts within the 30 second window and park. From there, the odometry pod will allow us to zero in on our autonomous. Once we have that fully completed, we could implement a visually driven autonomous.