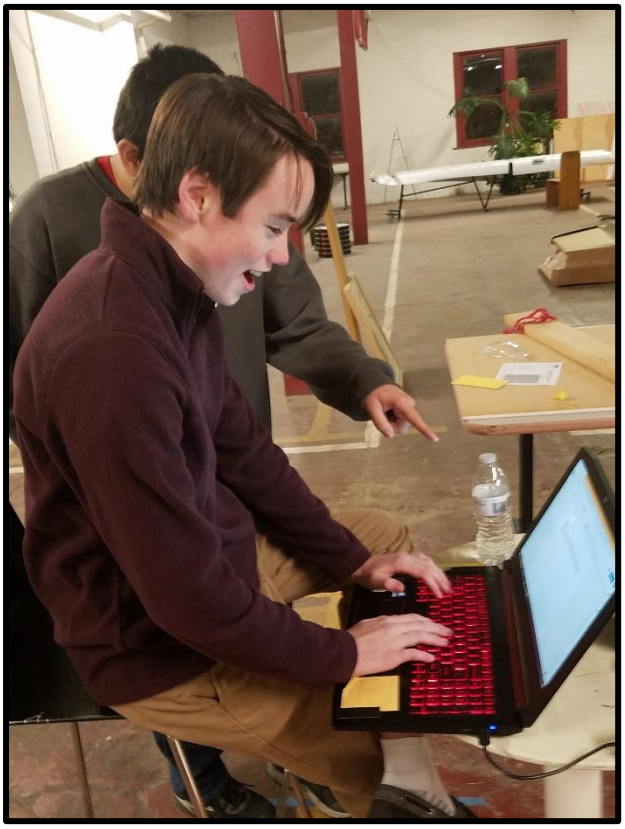
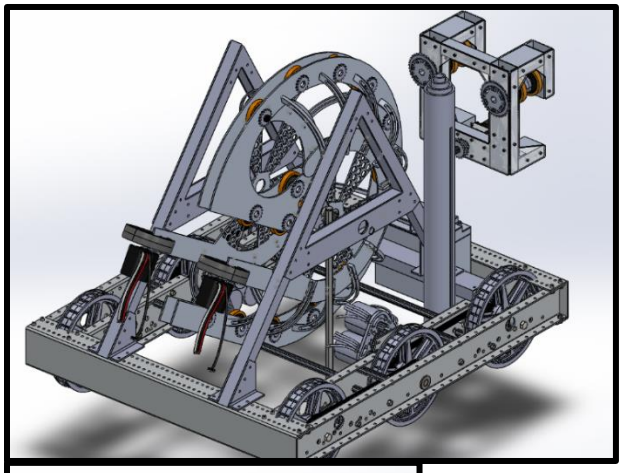
BONDS Robotics Status Report: Week 2

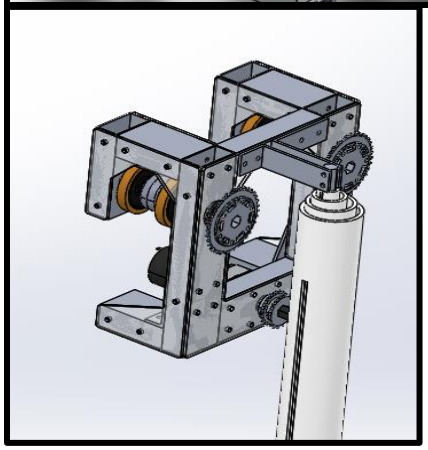
This week was full speed ahead for the team. We were starting to break from prototyping and start designing with CAD. Our Critical Design Review (CDR) is a week away and with the practice finished we now have the critique we need to move forward.

Programming



We completed the code for the new NEO motors, creating a new DriveTrain.java subsystem to test on one of our old robots, Goldeneye. The robot moved smoothly and at a high speed with only a tap to the joystick. These new NEO motors are going to give us a boost in maneuverability throughout the field during competitions. We coded the REV Color Sensor to correctly read red, yellow, and green and switch an LED strip's color based on the color sensed. After success with this, we started on the concept of switching the color shown on the LED strip to the color sensed, regardless of whatever the color may be. Something that is very important to understand in order to solve this problem is that all colors have a range of Red, Green, and Blue (RGB) values between 1 and 255 and that computers read all code as either a 0 or 1(binary). So in order to accomplish this goal we must provide code that maps the RGB values we get from the sensor to binary. After some research, we found an equation that we could use to take these ranges and manipulate them into a single value. Further information about this equation and its integration into different programming languages can be found in the link below:
https://rosettacode.org/wiki/Map_range





CAD

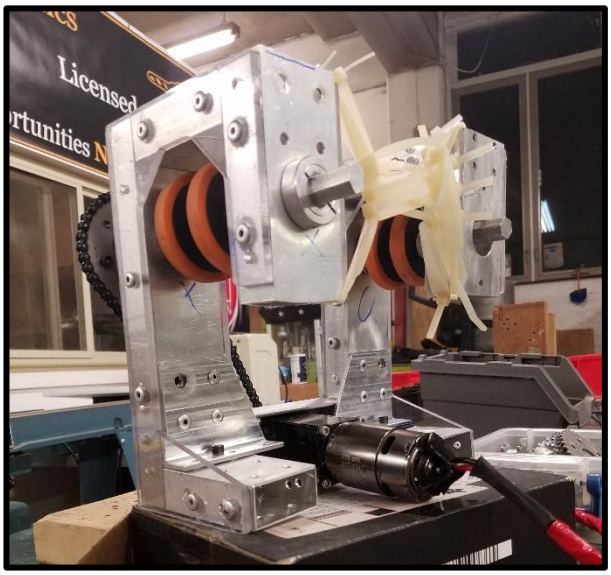
CAD team for the second week had their work cut out for them. We finalized our designs and fit the pieces together. The week ended with a full assembly! The bulk of the work was in the climber and snail (storage/shooter) design. The storage is planned to be separate from the drive train and have a motor to turn the whole mechanism. This allows us to save space and angle our shots. We designed a new intake to go with the rotating snail, which helped visualize how we would be able to implement to our rotating snail design. The work on the climber was mainly focused on the telescope elevator design in the back. Unlike most lift systems, this circular idea of the main shaft allows the elevator to stay in one place saving space compared to others that end up forcing the manipulator to stick out. This will make lining up with the scale much easier than compared to general elevators.

Control Panel

Part of the build team worked on the control panel. They cut holes in the chassis and began work on a mount for the control panel spinner. The prototype was working fine and ready to begin turning it into a real design. While in the process of recycling the parts of the prototype, the motor broke. We had to then get a new motor for the component halting the progress of the control panel for the time being.

Robot Cart

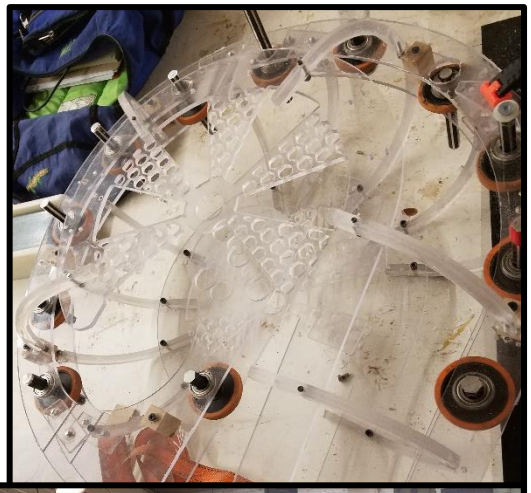
The build team also worked on the robot cart. They fixed it up using Lexan. The wheels were originally attached to pieces of aluminum that were bent over time. The team swapped these sheets out for new ones and reorganized the supplies to prepare for competitions.



Climber

We tested the climber and it was able to hold up a member of the team on a 14.5-degree angle slope. It can do this with little strain staying together quite well. We have to next get it attached to the telescope elevator and test the side-to-side movement with and without a load. Once we do that and fix any problems with the current design, we should be able to have a complete sub assembly ready to be put on a final robot.

Snail and Shooter



A prototype skeleton of the snail is finished. This version of the snail is a bit too large making the power cells lose compression. This prototype did show us that it's a valid design with being able to comfortablly hold five balls within the size requirements. The wheels on the side will all run simultainously making the balls push eachother in. The holes that are throughout the middle plates of the lexan are to lose weight. The hole in the very middle of the snail will allow us attach it to a motor rotating the whole body of our storage. The shooter that will eventually be attached to the snail was uprageded from its wood prototype to metal. We attached it to goldeneye, our older robot, to test it via code. Sadly the motors weren't working. After some testing we found that the motors had been tightened to far jamming the interior. We swapped out the machine screws for smaller ones. Now the shooter and snail are fixed and ready for further testing.

BONDS 5811

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