The Valor Observer

Build Season

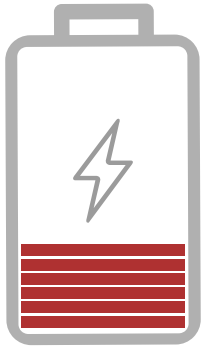
Week 4
Jan 26-Feb 1, 2020

Game Summary

Renewable sources of energy are everywhere, all the time. Working together in the 2020 season of FIRST Robotics Competition, INFINITE RECHARGE, we can support boundless innovation and create a society that's empowered, inspired, and hopeful. In INFINITE RECHARGE, two alliances race to collect and score Power Cells in order to energize their Shield Generator for maximum protection. To activate stages of the Shield Generator, robots manipulate their Control Panels after scoring a specific number of Power Cells. Near the end of the match, robots race to their Rendezvous Point and rise to the challenge.

Robot Report

Week 4 has come to an end and we are over halfway done with build season. Our final robot design has been finished. The parts order was sent out and we should receive the materials to start manufacturing next week. The chassis design went through a couple of changes but is now final. The intake, hopper, shooter, utility arm, and muncher assemblies are all compatible and their designs are final. Software and electrical are all caught up to speed and even ahead. For autonomous we have vision alignment integrated and have been able to dynamically track the shooting target using the limelight camera.



Robot status:
30% complete

Student Spotlight

Matthew

Design

Senior

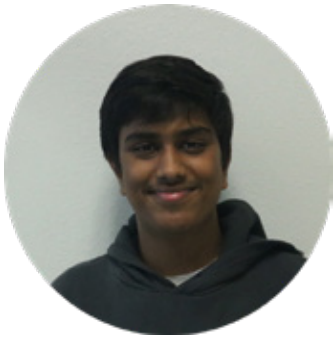
In 4th grade I joined robotics after seeing a poster advertising it as a club where you played with LEGOs and motorized your creations. I already played with LEGOs frequently so I thought "why not make LEGOs do things on their own?" For college I would like to study computer science with a specialization in artificial intelligence/big data, likely at CU Boulder. On my subteam I worked on the hopper CAD with Cole. I have now transitioned to adapting the scouting app to this year's challenge along with making some quality of life updates. Specifically, I changed the code so the data is stored as requested and I'm working on a solution to frequently upload data via QR codes. At competitions I'm the scouting captain, meaning I will ensure every team is scouted and Michael has all the data regularly.

Sarah

Design

Junior

This is my first year in robotics. My motivation to join the team came when I saw a video that inspired me to want to expand my engineering knowledge and skills so I could one day apply them to make the world a better place. In college I want to study aerospace or mechanical engineering at the University of Washington or California Polytechnic State University. I am on the design subteam. Currently, I am working on the shooter mechanism, but once the CAD for the robot is done I will shift to a hardware role. This week, I continued CADing the shooter of the robot and worked on system integration. The shooter was mounted and integrated with the hopper and chassis. Currently, I am working on mounting the limelight and will finish the hood once I am done.



Preetham

Manufacturing

Senior

I joined robotics in 11th grade. Robotics for me was an opportunity to experience a STEM environment that I craved. I was already taking STEM classes and thought "hey why not apply my knowledge in a practical world?" I am going to Texas A&M to study Computer Science. During build season, I mainly work on manufacturing and assembling parts. I get the specifications from the design team, and work with my peers to machine the parts from our CNC routers. I then assemble machined parts. During competitions, I scout other FRC teams to give us reliable information to help the competitive edge for our team. This week we mainly worked on dismantling the prototypes and organized our parts to get ready for robot assembly. We also started manufacturing parts that were already confirmed to be fully designed.

Sub-team Updates

Manufacturing

The manufacturing goal for this week was to strengthen the chassis and make necessary changes based off new CAD adjustments. After a design change for the intake, from through the bumpers collection to over the bumpers collection, we are changing the chassis. To add stability we switched the two front chassis bars into one long bar. Attaching the 1in x 1in bar above the front chassis bar was difficult. Next week we are going to shift into building each subsystem: shooter, intake, muncher, winch, and lift.

Design

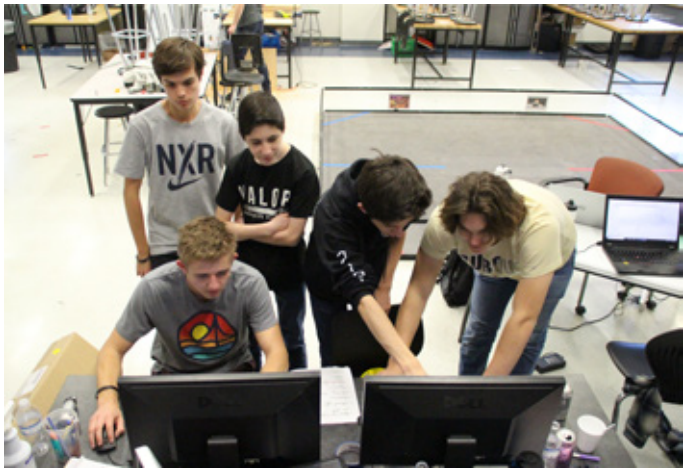
This week the goal was to finish our CAD by Saturday so we can begin to manufacture. We CADed and focused on system integration. We made sure that each component on the robot would work well together. This week it was difficult to maintain effective communication between each subsystem. But with a design review, we finalized the robot's design and made sure every student on the team understood each element. Next week the subteam will begin to make cam files and manufacture parts of the robot.

Software and Electrical

This week, we had to do lots of tuning for the ramsete code which took a while to make sure it was the tuning that was the problem instead of the base code. Our plan was to have our robot drive in autonomous paths with a ramsete controller and have the robot track the shooting target with a limelight camera. We also changed our tele-op driving to a rocket league control system and had to integrate this code back into command-based system as we had done for our other features. Next week, we will continue testing all of our autonomous paths and try to integrate vision into the auto path. Also, we will start creating code for our utility arm's setpoints.

Business

This week our focus was to finish the final edits on the mini essays, and write the intro & conclusion for the 10K essay. We will be submitting these both for the Chairman's Award next Monday. We continued to edit the Business Plan, which we plan to finish by next week. At the beginning of the week we attended the "Big Picture Night" to talk with parents and students about joining robotics and Valor. This week it was tough making edits on the 10k while staying within character count. We are preparing for February and managing all of our upcoming deadlines.



Meet the Mentor

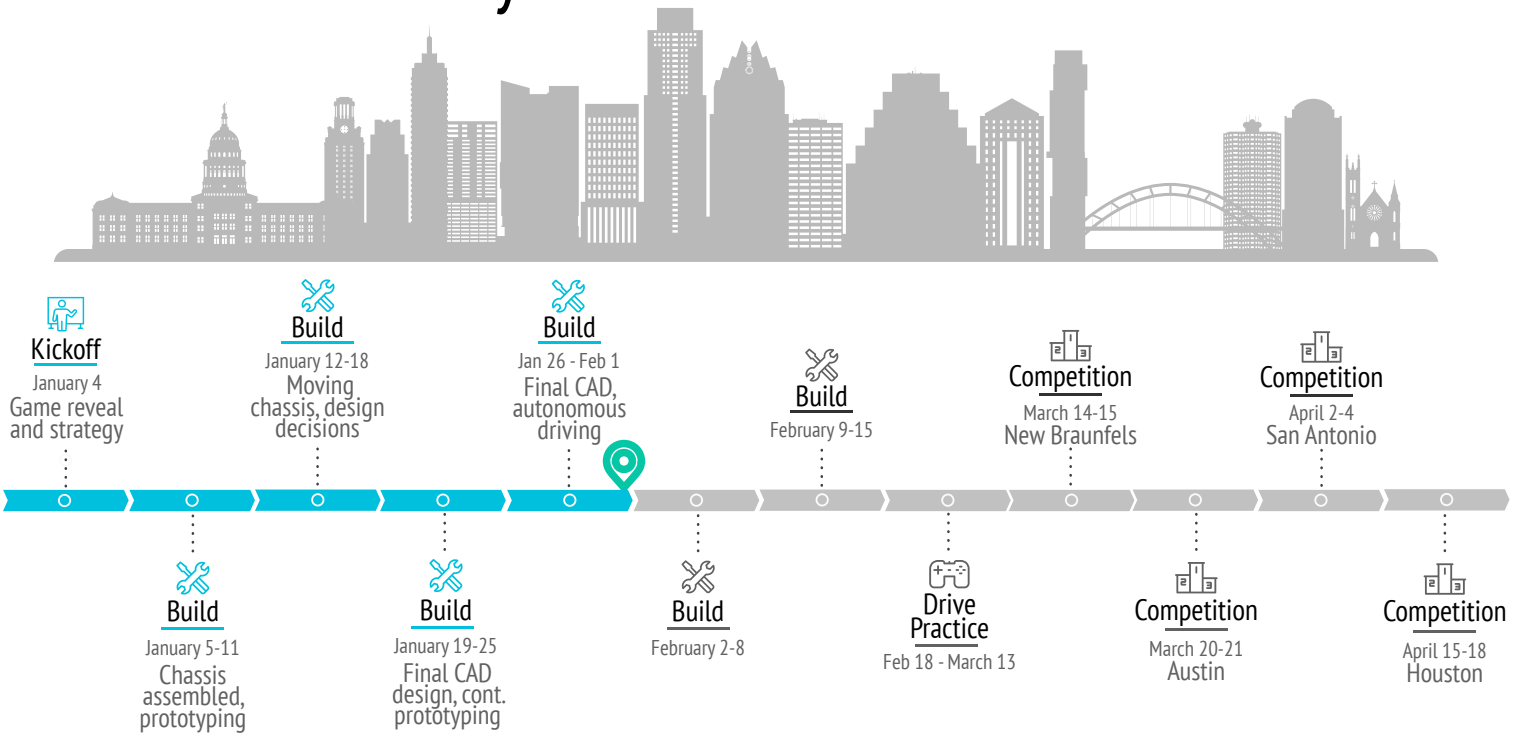
Matthew Carroll
Design Mentor

I am currently a Nuclear Project Engineer at Ultra, Energy and I am a part of the regulated temperature team. I specialize in Nuclear Temperature Sensors along with the rest of my team at work. I graduated with a BS in Mechanical Engineer from Texas Tech in 2018. I mentor the design and mechanical subteams and this is my second season as a mentor. I hope to give the students the same experience my mentors gave me during high school. FRC helped prepare me for college and my job, and I hope to pass down the skills I learned to the students.

Sponsor Showcase

Thank you to our sponsors for all their support! These partnerships help us pursue our mission and make a larger impact within the STEM community.

Follow the Journey



Quote of the Week

"I've never regretted anything I've done, even the things that I've failed at. I've often regretted not trying something really big, because you'll never know." - Dean Kanmen

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