Dec 2020 Issue 2. Vol 1

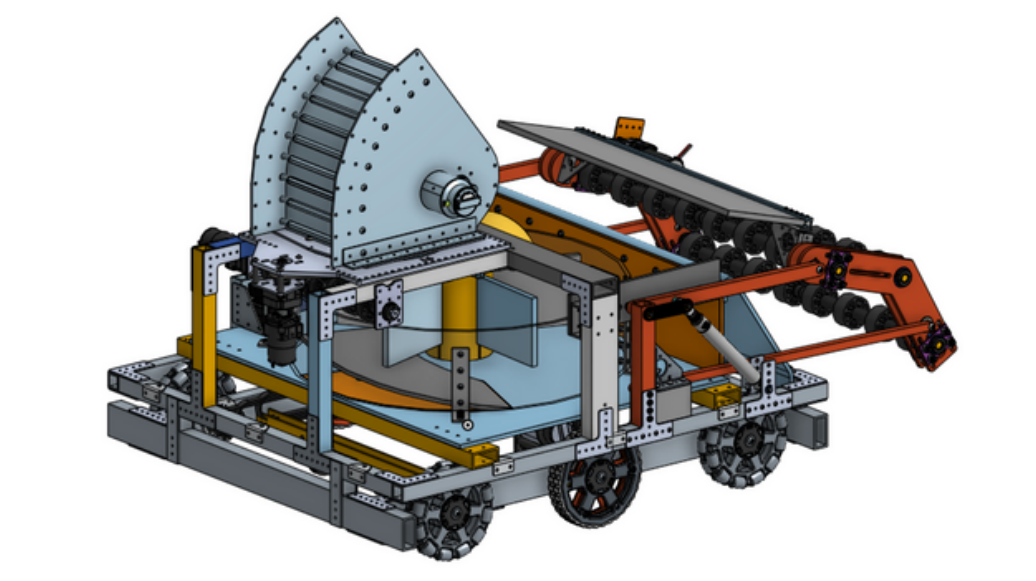
FHS ROBOTICS REWIND

Newsletter of the Fremont High School Robotics Organization

Upcoming Events

Fri Dec 18th Stocklmeir Robo Fun (FRC 3501): 6-7pm
Mon Dec 21st to Fri Jan 1st Mid-Year Break
Sat Jan 9th Game Kickoff (FRC 3501)

From the Basics: FRC Training Project



A CAD model of the modified robot */ Cont'd on Page 8>>*

Getting to Know Pintuna

Kaitlin W (jr.)

Although 2020 has presented many new challenges, it has prompted us to think outside the box about the ways we generate funds and stay connected to our community & supporters. We are excited to announce our partnership with Pintuna, ...
(Cont'd on Page 5>>)

Built for Competition

Satyansh R (jr.)

Build season is the time where all teams scramble to form their final robots. Using a combination of teamwork and skills from the training season, the team creates a robot for the year's game. Building the robot is a long journey, so it is recommended for teams to split into subteams... (Cont'd on Page 7>>)

Progress Report

Chloe L (jr.) & Kaitlin W (jr.)

FRC Mechanical Design

Adam, VP of Mechanical Design, explains that so far they have “designed an intake, as well as a mechanism, to hold balls once we've picked them up, that feeds directly into the turret.” Their next steps are to complete the drawings of their intake design, finish “adding final touches”, and then have a couple weeks off for the holidays, prior to the build season beginning in January. This season, “everyone on the design team has gotten experience with designing a robot, and we have done a good job of critically evaluating our design.”

FRC Manufacturing

As the design team finalizes plans for the training robot, the manufacturing subteam has already begun ordering parts to build it with. According to Kavin, the VP of Mechanical Manufacturing, they plan “to start manufacturing and drilling holes on the first week of December'' and “to have everyone drill their holes before the semester ends.” He noted that this timeline is a bit later than expected, as their “goal was to assemble the robot by the end of the semester,” however, they will be picking up their pace so that the robot is available for the software subteam to do testing. One of the subteam's recent accomplishments is that this year, every manufacturing member “has the knowledge to make a parts list/cutlist.” They did not do this last year, so it is impressive how quickly they were able to learn.

FRC Software

While the mechanical team is gearing up to build the robot, software is finishing up the drafting the code that will control and run it. They are focusing on four different subsystems: the intake, the hopper, the turret, and of course, the drivetrain. The VP of Software, Dwijen, reported that “most of the projects are going smoothly,” despite “some technical issues here and there”. They look forward to testing this code “once mechanical has finished prototypes of the subsystems.” This year, they have prioritized keeping the codebase organized, and “are working to ensure that we have a more cohesive understanding of the libraries and functions that we have available.” While they continue to deepen and improve their knowledge of the different programs and functions, they have also been developing new ways to make it easier to access resources for future reference.

FRC Electrical

The electrical subteam recently completed the skeleton design for the electrical board, which will allow them to make the full design next. They plan to continue “manufacturing the electrical board,” and soon they will be working on the sensors as well.

Progress Report (Cont'd)

FTC Sparkbots

Expanding past just robot building, the FTC teams have been engaged in more outreach and have accomplished a lot within the team as well. Sparkbots Lead Juan says, “We're currently working hard to finish our robot as soon as possible since we have a scrimmage on Dec. 12” and “Mechanical is currently mostly finetuning the mechanisms we already have while software is working on putting the various programs together...”. They’ve had quite the number of success in the last few months, including “...our intake system was tested last week and it worked pretty well (shoutout to Eesha and Nika), our shooter system is working very well (shoutout to Ryan), and our arm is ready to be prototyped and has an amazing design by Oliver. Also, Zek has been doing a lot of work for software and was able to create programs to prototype all of these mechanisms.We had an outreach event with a local Boy Scouts Troop which was pretty successful.”

FTC Infernobots

Similar to the Sparkbots working towards the scrimmage, Tanvi, the Infernobots Lead, reports, “Currently, we're towards the end of the FTC build season. Our software team is working on finishing up autonomous code, and will also soon be well into tele-op. ...The two final major mechanical components of our robot are a conveyor belt from the intake to the shooter, and the shooter itself, which are both in progress.” They’ve focused highly on their robot with each subdivision of the team making great progress. “An important software achievement is that they are very close to successfully programming the color sensor to park on the white launch line at the end of the autonomous period. Mechanical built the intake mechanism, which was a very important accomplishment because most other mechanisms had to be situated based on the intake's positioning. Overall, we've been making good progress!”

FTC Emberbots

Emberbots Lead Oindree lists that within each of the subdivisions, “mechanical is creating an intake mechanism to bring the rings up to the shooter, software is continuing to code for the autonomous period of the game, and technical is starting to create our robot through CAD”. They’ve had some notable successes like having the “robot programmed to strafe/rotate in all directions and successfully created the shooter mechanism”. They’ve had challenges with the “In-person meeting time change” and realizing “deadlines are getting closer than we thought”. The team plans to hold “a boy scouts outreach event planned for Dec 13th”. While this final accomplishment may seem overlooked, “everyone actively participates and feels welcome”.

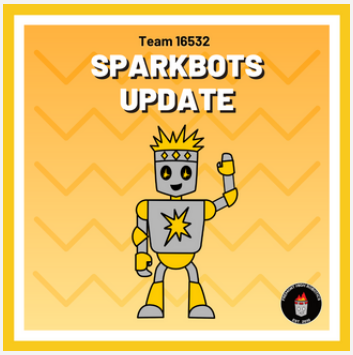
Progress Report (Cont'd)

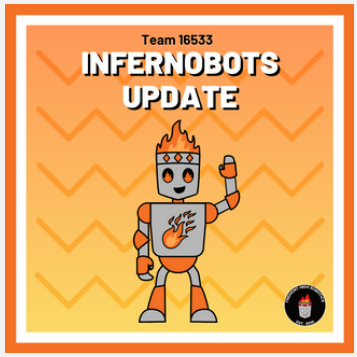
Business

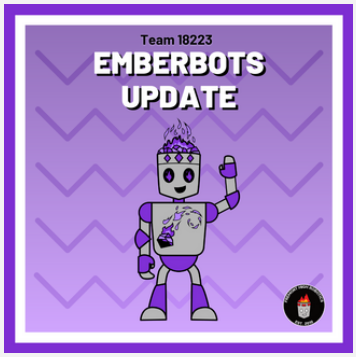
The Business team has been hard at work, crushing accomplishment after accomplishment. Manan, the VP of BaM and leading our business subteam, says, "...Through writing grants, the Business team has completely revamped the Fremont High Robotics Team Business Plan... We've...collectively submitted 12 grants, online & written....Additionally, we promoted and fundraised for the Bike-a-thon to raise money to aid the effort against California wildfires.... We have begun promoting the collaboration between Pintuna and FHS Robotics to create an ongoing source of fundraising." The Business team plans to "continue promoting and advertising the Pintuna x FHS Robotics collaboration for fundraising through the holiday season. In December, we will be having Pintuna's founder and our former fundraising mentor, Mr. Kedia, host a few business-related workshops. Meredith, their marketing lead, will host a marketing workshop for the team."

Media

As the Media team continues to become more and more established, the accomplishments and ambition follows closely behind. Chloe, the Media Lead, says "Currently, we are renovating our entire website and have the layouts for all the pages done, we started production on progress videos for our FTC teams, and while I'm writing this, we are working on our second newsletter." A few challenges have presented themselves during this process and "we have to limit our number of simultaneous projects to keep the team from being spread too thin...." In the upcoming time before break, "we hope to have access to Adobe programs from FIRST... This should help with establishing a sustainable graphics team and will divide up the responsibility." We have some big plans coming soon, but we've already done quite a lot in the short time the team has been made. "We successfully created our first newsletter back in October and made 3 weekly themed social media posts about current events on our Instagram."



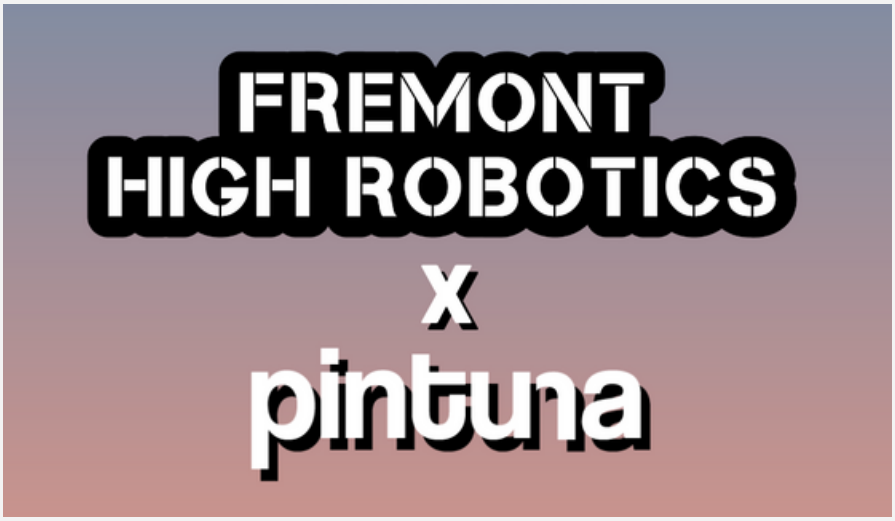




Find all the brief updates on our Instagram

Getting to Know Pintuna (Cont'd)

Kaitlin W (jr.)



Check out our Instagram post for how to use Pintuna and support us

...a new platform that allows a portion of the proceeds from gift card purchases to go directly to our organization. With over 40 options of big brands to choose from, there is now a way for them to use everyday purchases to provide our team with the financial support we need to continue spreading STEM throughout our school and global community.

We had the privilege of interviewing Pintuna's founder, Ashwin Kedia, about what went into the creation of the service, and what their next steps are for both the platform and our partnership. Our students have been able to learn more about marketing and entrepreneurship by participating in business workshops led by Mr. Kedia and their marketing lead, Ms. Meredith Soden.

Mr. Kedia explained the origin of the name "Pintuṇa" is from the South Indian language Malayalam that translates to the word "support". We asked him about what inspired the service, and how long it has been in the making. "The idea for Pintuna," Mr. Kedia explained, "got seeded when I was working as a fundraising mentor with Fremont High Robotics last year. Fundraising is a very challenging work and I saw at close quarters how hard Firebots worked to bring in every dollar. I felt the need to explore the possibility of creating an offering that can 'support' and augment the fundraising efforts of Fremont High Robotics, other clubs at FHS and nonprofits at large."

Mr. Kedia has worked with our organization in the past, and has been connected to us for nearly a decade. We asked what encouraged him to partner with us. He responded that "Fremont High Robotics is a fantastic organization and is near and dear to me," explaining that he is actually the father of two Firebots alumni: Rishab Kedia, and a former Team 3501 President, Yash Kedia. He added that they "are very proud to be associated with Firebots for over eight years now," and that he "always wanted to start the Pintuna journey by partnering with Fremont High Robotics."

Getting to Know Pintuna (Cont'd)

Kaitlin W (jr.)

Of course with every attempt at a new business there are challenges to overcome. The objective of Pintuna, according to Mr. Kedia, “is to offer an online, transparent platform for fundraising to nonprofits, clubs and organizations through sale of merchant gift cards.” He explained that “for the initiative to be successful we need LOTS of nonprofits and merchants to participate,” which meant that their “biggest challenge initially was to determine where to begin.” With time and effort, they “have overcome the initial hurdle and have received participation from over 50 very large merchants.” One of the main reasons they were able to accomplish this was having “an excellent team that believes in the Pintuna mission,” in addition to “a very strong technical foundation that will allow us to scale”.

Although they have already accomplished a lot in the short time the service has been available for, Mr. Kedia explained that the platform is still “an early stage startup”, and therefore has “a very long way to go.” As for their plans to expand Pintuna in the future, they intend “to add many merchants and nonprofits to the platform”. At the latest meeting for Fremont High Robotics’ Business subteam, Mr. Kedia had students brainstorm ways to effectively promote Pintuna to other nonprofits and robotics clubs, so that more organizations will decide to start using the platform to fundraise. In terms of upcoming improvements for the service, they have been “working on introducing alternate payment methods to eliminate the credit card fees that will enable the nonprofits to earn more for each card sale.” Our organization has already been encouraging other FIRST teams to use Pintuna.

Mr. Kedia offered helpful insight when we asked if he had any advice for robotics students about trying something new or becoming successful in future business projects or entrepreneurship. “Entrepreneurship is not easy and it is not supposed to be. There is no guaranteed recipe for success in business, but there are several traits common to all successful entrepreneurs - integrity, courage, hard work, commitment to quality and luck! If you see an opportunity to make a positive impact do not hesitate, do not worry about failure.” His closing comments were, “Fremont High Robotics Club offers a great platform to students to fine tune their STEM as well as Life Skills. Use these skills to solve societal problems.”

We look forward to continuing our collaboration with Pintuna, as well as any other companies who would like to support us. Through our workshops with the Pintuna team, we gain crucial insight about essential business strategies for better supporting our team. This year, remember to support FHS Robotics with your holiday shopping on Pintuna!

Built for Competition (Cont'd)

Satyansh R (jr.)

...and divide the work evenly to ensure results with the highest efficiency. For FRC, with a game kickoff in early January, the teams normally have 6 to 8 weeks before the first week of competition to build. For FTC, their entire build season begins in mid-Fall leaving a very short training season for new members. Once the team has completed their robots, they must prepare for competition.

Our typical year-round schedule

Competition season is the culmination of the entire season to test their skills in a new game every year. All teams come together to see who is the best in these games. Competitions award teams not only based on wins, but also digital animation, spirit, safety, and many more.

The team is growing rapidly and with this growth, comes the need for plans and expectations to get every member on the right track. Currently our FRC team, 3501 Firebots, is in the process of the training project, which allows the team to fully understand the robot and its mechanics to transition smoothly through build season. The plans for build season vary from subteam to subteam. Mechanical design aims to build a climber CAD model during build season. Mechanical manufacturing aims to work quickly and efficiently from what was happening during training season. Software aims to get all of its members to learn the ins and outs of the code, so that build season confusion can be kept at a minimum. Electrical aims to build a worthy electrical board quickly. Most meetings usually consist of planning. Mechanical and Design would design CAD models and some temporary parts of the robot. Software is creating code that is, in theory, for when the parts are ready. In terms of our 3 FTC teams, build season is very different. The team has been meeting 3 times a week trying to get the most done on their robots. The large increase in new members and an entirely new FTC team have been faring well under the time pressure and were meeting in person for a few hours before the COVID-19 shutdown order for the county.

With the rising COVID-19 virus looming, there is a lot of uncertainty in competition season. For now, most teams want to just get the robot in a place that it can work. We have the plan for the team to take part in a couple of remote challenges as a replacement for the competition season this year. For FTC, the plan is to go to Qualifiers in January and February depending on whether the virus increases or decreases. By continuing to iterate the robot designs, we can get one step closer to finishing our robots to the best of our ability.

From the Basics: FRC Training Project (Cont'd)

Chloe L (jr.)

This year has been unlike any other and as such, robotics has changed unlike any other year. Initial plans, like the training, build, and competition season for FRC have been derailed (See Page 7). However, the FRC leads and team quickly figured out a different training season to take advantage of the unchanged game this year and to best get our members experienced and knowledgeable.

Known as the Training Project, it is “pretty much a mock build season. However, since we know that this year’s game will be the same as last year’s, we may use the mechanisms we built during this training project on our actual robot this coming year” says Zaki, the organization President. Getting an easy head start to prepare members for the build season, this training season uses the real competition robot from last competition season to demonstrate the applications of each mechanism.

While it would be convenient for all of our members to have prior knowledge of the robot, that isn’t the case for our team. This project was intended for “ newer members to learn and for returning members to strengthen their skills. We’ve put a heavy emphasis on learning rather than being successful during the project, which is why we’ve been behind schedule for some mechanisms.”

The season started off unconventional and unfamiliar, but there are upsides too. “This year, we know that the game will be the same as last year’s, so we can do a training project that allows us to utilize what we build during the training project on our actual robot, which hasn’t been allowed in previous years.”

Each subteam has been steadily working on their portion of the project and since we started early in the season, we have more flexibility in the schedule. “Design started working in mid-October, and the other subteams started working about a week or two after. Since this project kind of flows into build season, there isn’t really a set end date. So far, the manufacturing subteam hasn’t had much to do so they’ve been joining design meetings. Electrical and software have had their fair share of work as well.”

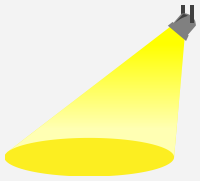
From the Basics: FRC Training Project (Cont'd)

Chloe L (jr.)

With a tentative plan of action due to various outside factors, the time schedule is not completely set, but, roughly, these are our goals for completing the robot before a possible competition season. The first phase includes the design subteam designing the mechanisms in CAD and making part drawings, the electrical subteam designing the electrical board in CAD, and the software subteam drafting code. All of these tasks would have been done in January, but with the game unchanged, we've done most of this during the training season. The second phase would be the manufacturing subteam starting to build the mechanisms designed, the electrical subteam starting to build the electrical board, and the software subteam working with the other subteams to iterate their code. This is the bulk of our build season and gets the foundational work of our robot done. The final phase is the software subteam doing a lot of testing and the other subteams making iterations if needed. The testing phase is near the end of build season and right before we choose a driver to run through the testing field for practice.

There are many changes to our normal course and plans for the season, but we'll manage to get through it all in the end. Go Firebots!

Student Spotlight



Chloe L (jr.)

In this issue, we asked Soham M, a junior in our Software subteam, Ryan D, a sophomore in the FTC Sparkbots, and Nick C, a senior in our Electrical subteam to give their unfiltered student perspectives on the team.

In response to the question: What are you most proud of within robotics?

Soham M: Last year, I was able to get a lot of features on the 16533 robot (e.g Mecanum, Auton Strafe, Driver Controls, etc) and my dedication was able to get me into the software pit. Robotics really helped me grow and provided motivation to work as hard as I could.

Student Spotlight (Cont'd)

Ryan D: The thing I am most proud of within robotics is working together as a team to compete in competitions and finishing the robot. The competitions let me see how far we have gone during the season and how we have improved.

Nick C: I'm especially proud of the productive, uplifting, and inclusive community our team has built over the years, and how both students and mentors continue to push barriers, guiding the Firebots to achieving greater possibilities.

Contribution is another significant part of building a team and effectively utilizing every member's skills is something we strive towards.

Do you feel like you are contributing and useful to the team?

Soham M: I think that the structure of teams we have today is severely flawed and more emphasis is put on collective growth than individual growth, which is normally fine, but if we don't place emphasis on individual growth as well, a good portion of the team will not be included.

Ryan D: I feel like I am contributing to the team. I have been able to work on a part of the robot and I have been able to design and build parts of the robot.

Nick C: I do feel as if I have a place in the team and therefore believe that I am useful to its operation. ... Throughout my affiliation with the team, I have discovered many ways in which I could impactfully participate, whether that be by working for business and media or electrical.

We always want to check in with our students to see how robotics is impacting their lives, whether that be making it more fun or adding loads of stress.

Soham M: It's made it more engaging, as I am now part of a community where I can have fun and work at the same time. Ultimately, robotics is a net positive to my high school experience.

Ryan D: Robotics has made my high school experience more fun. I have been able to look forward to being able to have fun building and competing with a robot.

Nick C: All throughout high school, robotics has been the positive defining factor to my overall experience at Fremont. At times, it can be strenuous juggling between schoolwork and robotics, but at the end of the day, it's the people you get to know as well as the experiences you share together that make it all the fun.