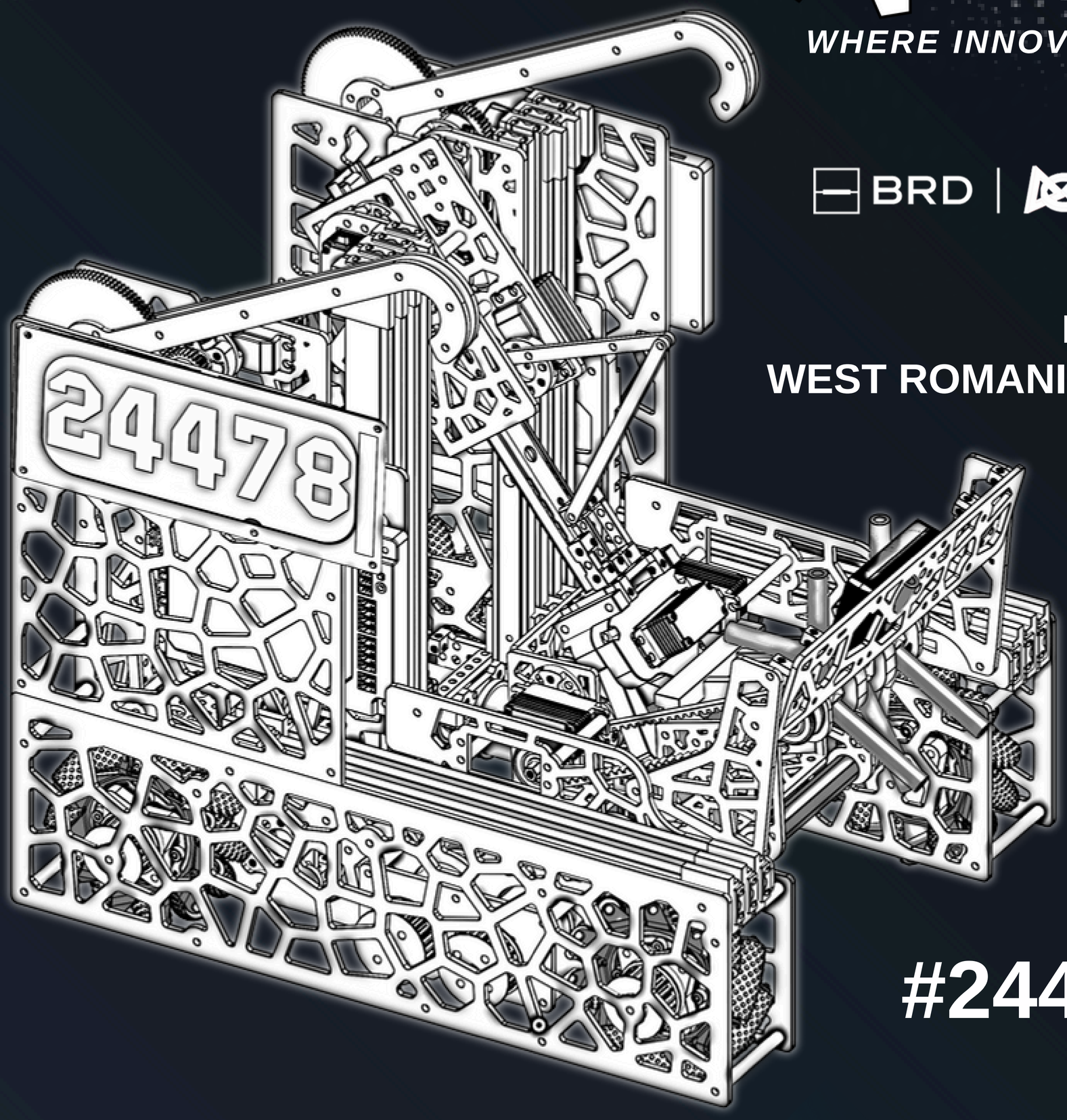
ENGINEERDS

WHERE INNOVATION MEETS COMPETITION

BRD | FIRST TECH CHALLENGE ROMANIA | NAȚIE PRIN EDUCAȚIE | INTO THE DEEP

2024-2025 - SEASON #9
ENGINEERING PORTFOLIO
WEST ROMANIA LEAGUE TOURNAMENT



#24478

@cnrgengineerds

@engineerds_ro190

@engineerds24478

@engineerds

"RADU GRECEANU" NATIONAL COLLEGE
SLATINA, OLT, ROMANIA

MEET OUR TEAM

ENGINEERDS #24478

EngiNeerds #24478, is a FTC team from “Radu Greceanu” National College, in Slatina, Olt county, Romania. The team is composed of 17 members, from 9th to 12th grade, each bringing a stack of knowledge that helps us become better versions of ourselves each day, collaborating as a team. This year is our school’s 2nd FIRST Tech Challenge team, paving the way for more robotics education. This year, we look forward to not only excelling in competitions, learning from mistakes, and promoting STEM values in our community, but also cultivating a clearer perspective on the vast and ever-evolving world of technology.

LUȚĂ DAVID
Leader,
Hardware Lead
3D Designer
In-Game: Driver

DUMITRESCU ROBERTO
Programming Lead

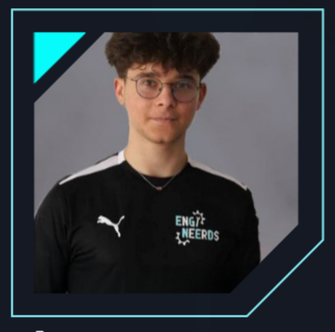
PRICA RAREȘ
Hardware

UNGUREANU EDUARD
Hardware

VELCEA FLORINA
Marketing & PR

OLANU GABRIEL
Hardware
3D Designer
In-Game: Human Player

POPA ANDREI
Hardware
In-Game: Driver



PÎRVU MIHNEA
Programmer
In-Game: Coach

STANCA ROBERT
3D Designer

DOBRE IZABELA
Marketing & PR

ELISEI BIANCA
Marketing & PR

NEDEIANU OANA
Marketing & PR

RĂUȚĂ ȘTEFAN
Programmer

RAICEA RAREȘ
Hardware

BĂLĂȘOIU LUCA
Programmer

CIUBOTARU ANDREI
Hardware

BĂRBUIA MARIA
Marketing & PR

ALIN DUMBRĂVESCU
Mentor

ANDA DUMBRĂVESCU
Mentor

FIRST TECH CHALLENGE ROMANIA | INTO THE DEEP presented by RTX | 2024 SEASON #9 2025

ORGANIZATOR NAȚIE PRIN EDUCAȚIE | PARTENER FONDATOR BRD GROUPE SOCIETE GENERALE

SUSTAINABILITY

ENG NEERDS #24478

As a team that operates independently, we work hard to fund ourselves through events and sponsorships. We do this by putting our best effort into everything we create and by sharing our passion for STEM with our community. Through our dedication, we build meaningful connections with sponsors and supporters who believe in our mission.

OUR SPONSORS

PIRELLI
delta aluminium
decora DESIGN
Popas Sport
vimetco extrusion
OVIDIU P. GORAN CABINET DE AVOCAT - ATTORNEY AT LAW
MARIPOSA
Electric Total Srl Solutii in electricitate
mimDragon ADVERTISING
FARMACIA ADONIS
Agrobionics
AS COMPUTER
Carmin popstar Prod(10000)
Pandipo since 1996
CONTUR TECH
ARTROM

FINANCES

PIRELLI - 5.000 RON
DELTA ALUMINIUM - 2.500 RON
POPAS SPORT -10.000 RON (hot meals accorded to the team members)
VIMETCO EXTRUSION - 10.000 RON
"OVIDIU P. GORAN" ATTORNEY'S OFFICE - 750 RON
MARIPOSA - 5.000 RON (the equipment for competitions - T-shirts and Hoodies)
MIMDRAGON – 1.000 RON
CARMIN POPSTAR PROD – 10.000 RON
PANDIPO - 650 RON (Pastry food accorded to the team members when going to meets)
AS COMPUTER (1 laptop)
CONTUR TECH (Aluminum plates and components of the robot)
ARTROM (5.000 RON)
Slatina City Hall, Decora Design, Electric Total, Adonis Bob, Agrobionics

TRAINING NEW MEMBERS

We needed to find a way for them to gain experience in building, designing, and programming before officially joining the team as members. Thus, volunteering is the first stage of entering a team, in which you learn, adapt, and integrate effectively within the team. This is the stage where you gain experience and knowledge to eventually become a reliable member of the team. Another way to become a volunteer is if you were previously part of the team but can no longer dedicate enough time to actively support it. In this case, more engaged volunteers step in to take your place, ensuring the team's continuity and success.

Căpățână Elena
Featuring in the future in Programming

Nica Elena
Featuring in the future in Marketing & PR

Cîrstina Daniel
Featuring in the future in Hardware

Marinescu Andrei
Featuring in the future in Hardware

Cuje Cosmin
Featuring in the future in Hardware

Cimpoieru Elisabeta
Featured in Marketing & PR

Pîrvu Mihaela
Featuring in the future in Marketing & PR

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STRATEGY

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GAME STRATEGY

General Strategy: We wanted to score as many game elements as possible during the Autonomous period, but also in the Tele-Op period. Thus, based on the experience gained this season, making the robot as efficient as possible was one of our top priorities.

AUTONOMOUS STRATEGY

Specimen placing Autonomous:
We changed the robot so it does not have to spin 180 degrees to take and place specimens, but to make a single diagonal movement. This does not only make the algorithm simpler but also more efficient.

Sample in the basket placing Autonomous:
We made the algorithm simple and with very little movement so that it is most effective and to have the assurance that the robot places as many samples as possible.

TELE-OP STRATEGY

We chose to place samples in the high basket over placing specimens, because it is faster and we could gain more points throughout the game. When the high basket is full and we still have time left in the game, we start placing specimens on the high bar until the End Game.

END GAME STRATEGY

We aimed for the level 2 ascent because we can score more points with the little time that we have left in the game.

TEAM STRATEGY

Team Structure: Our team operates entirely under student leadership, allowing us to take full control of meeting agendas, project management, and season planning. This hands-on approach helps us develop strong leadership skills while ensuring that each member takes responsibility for specific tasks and contributes to the team's success.

GOOGLE CALENDAR

To ensure that we are organizing our work most efficiently, to remember every event that happens involving the team, and also to schedule our life outside robotics so we don't affect either of them, we started using Google Calendar, a reliable source to plan out events, competitions, meetings, to place out deadlines, and so on.

We have a responsible member to always update the Calendar so that every team member is informed about the team plans and schedule. In the description on each calendar, we have all the details about the event: location, time of leaving, transportation (for competitions and events), and description of the activity that we are going to conduct.

BRAIN STORMING MEETING

Every Monday the team has a meeting with our mentors and EngiNeerds NextGen #25916, the second team of "Radu Greceanu" National College, in which we discuss if we have any problems with the team, the robot, the collaboration between us and the other team. Moreover, we organize our tasks evenly for everybody throughout the week, plan and schedule events outreach activities, participating in meets, and so on.

GOALS

- Exhibit the core values of Gracious Professionalism throughout all competitions and outreach events.
- Motivate & reach out to youngsters from all backgrounds, inviting them to pursue a career in STEM.
- Market ourselves using social media not as a robotics team, but as a friend group passionate about technology and innovation.
- Learn and sharpen all the skills required to succeed in FTC, such as leadership, responsibility, teamwork, and professionalism
- Participation in the official FTC international competition: Our ultimate aspiration, driving us to work tirelessly every day.

OUTREACH

Spreading LEGO Robotics

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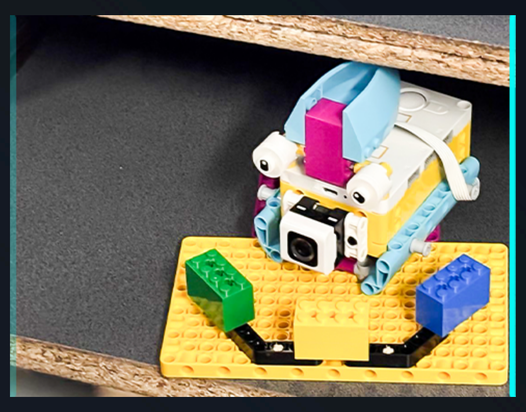
We've grown so much thanks to the mentorship and sponsorship we've received throughout our time in FIRST. Since not every team has the same experience or access to these resources, we use outreach to help bridge that gap and share the opportunities that have helped us succeed.

TEACHING CHILDREN TO BUILD THEIR OWN LEGO ROBOTS

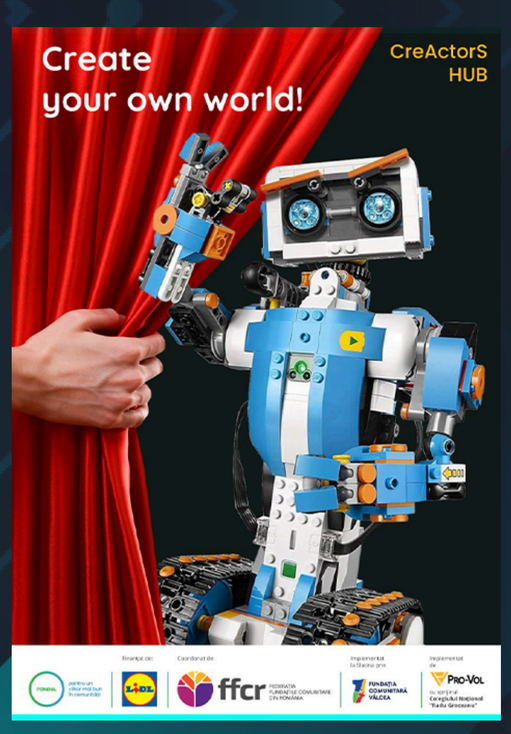
We have made the commitment to support the local community by offering an ongoing, engaging initiative designed for children passionate about STEM. Every Sunday, our team convenes in the laboratory, guiding the children as they explore and develop their talents in mechanics and programming, fostering creativity and problem-solving skills for their future, all while building LEGO robots, having 15 meetings up until now.



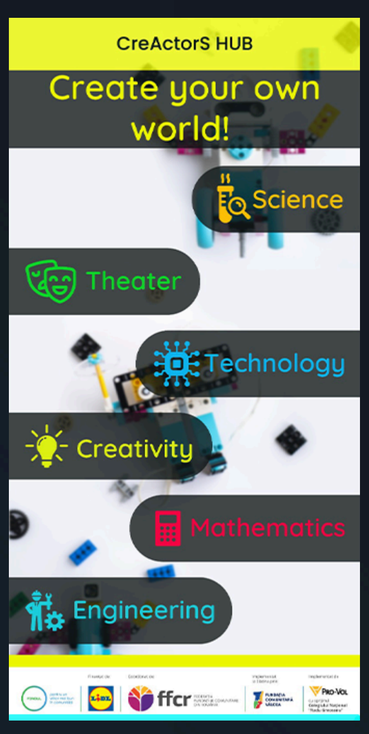
LEGO ROBOTICS EDUCATION IN UNPRIVILEGED AREAS

This project is an educational initiative implemented in partnership with the Vâlcea Community Foundation and sponsored by LIDL. We aim to organize robotics sessions for children in rural schools in Olt County and to bring STEM closer to students through active and hands-on learning sessions. The sessions will be organized at our headquarters, “Radu Greceanu” National College, for children from neighboring localities as well as those from Slatina. Additionally, at the end of the project, each participant will receive a volunteer diploma in recognition of their active involvement, acknowledging their effort and enthusiasm for learning new things and contributing to the success of this initiative. This is an excellent opportunity to support the educational development of future generations and to learn alongside children.

CREATORS HUB ACTIVITY



We created an activity for both robotics and theatre-passionate people, in order to integrate STEM values into the arts by using LEGO robots as actors in theatrical performances that illustrate traditional stories. By designing and programming robots to play key roles in these plays, we blend creativity with engineering, encouraging problem-solving and innovation. With LIDL’s support, this approach not only makes STEM education more accessible but also highlights how technology can preserve and reimagine cultural heritage for new generations.



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OUTREACH

Connecting to the Community

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SOCIAL MEDIA

We leverage social media as a powerful tool to promote our robotics activities, engage with the community, and inspire the next generation of STEM enthusiasts. Through dynamic content, including the use of memes and other comical content related to First Tech Challenge and its hardships, we showcase our journey and team spirit. By sharing educational posts, competition highlights, and success stories, we foster connections with sponsors, partners, and aspiring young engineers. Our strategic use of platforms like Instagram, Facebook, and TikTok helps us amplify our impact, attract support, and encourage broader participation in robotics and STEM education.

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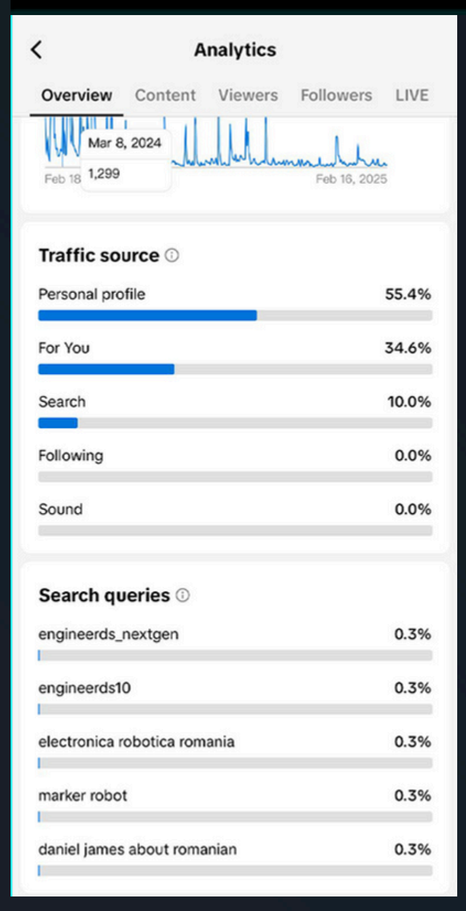
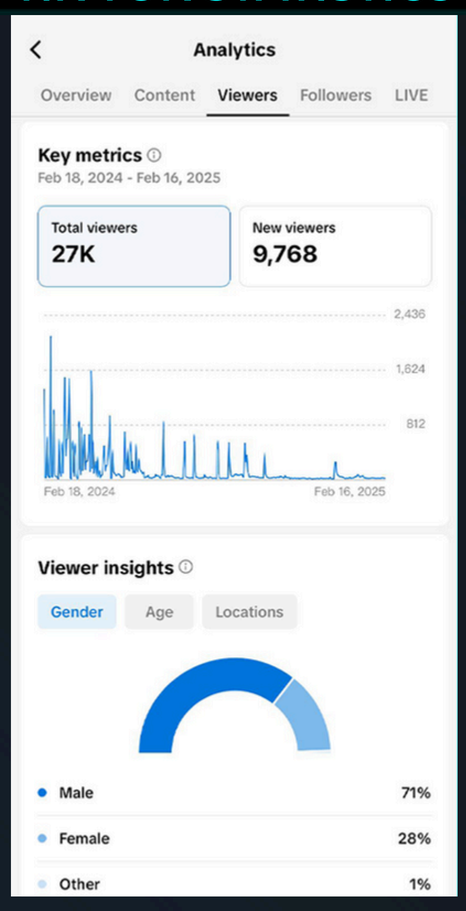
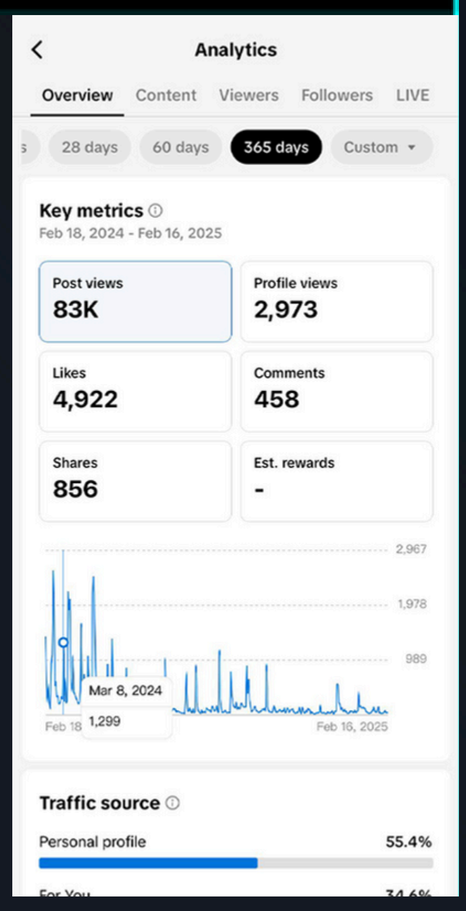
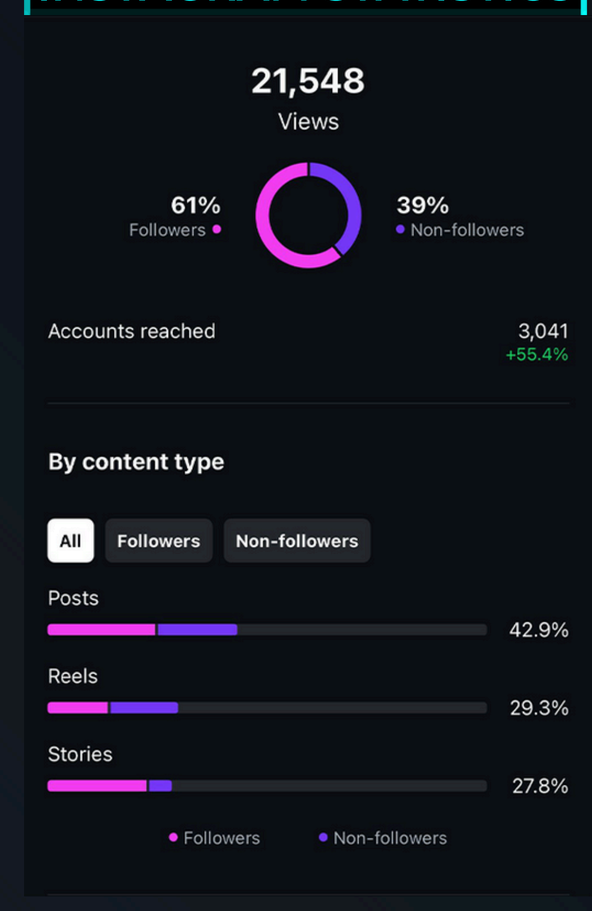






INSTAGRAM STATISTICS



THE "BOTCAST" PODCAST

The podcast takes place biweekly alongside the TechNova #12611 and Mechanical Paradox #7182 teams. It focuses on answering questions and sharing the most valuable FIRST experiences we've gained in our year of experience. Through the Botcast, we hope to build a community that we can help advance, just as we have done. Moreover, this podcast is an opportunity to collaborate with other teams, where they can ask questions, and connect with the overall FIRST community.

FTC DISCORD

Our members have maintained consistent communication with numerous teams on the official FIRST Tech Challenge Discord server. Through mutual collaboration, we have successfully built valuable connections with teams such as AI Citizens, Cyllis, Tech Nova, Mechanical Paradox, and Solar Sparks, . We've also started a direct collaboration with the team Whats Up, where we shared opinions about robot designs, odometry, and the ongoing season.

1382 Messages Since Kickoff

100 Members

OUTREACH

Connecting to the Community

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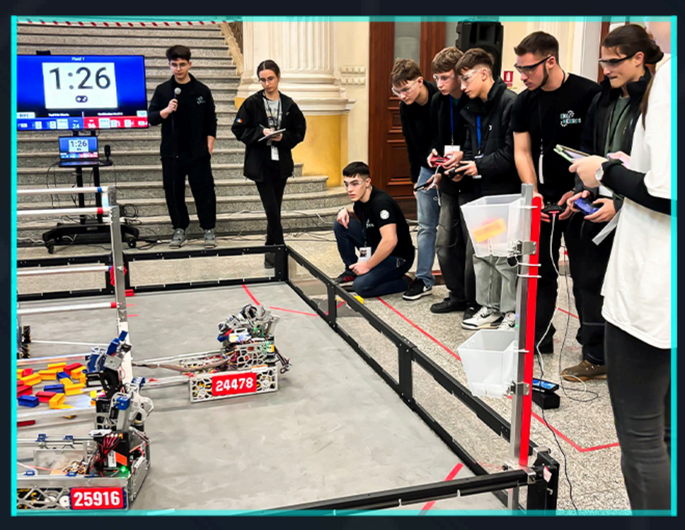
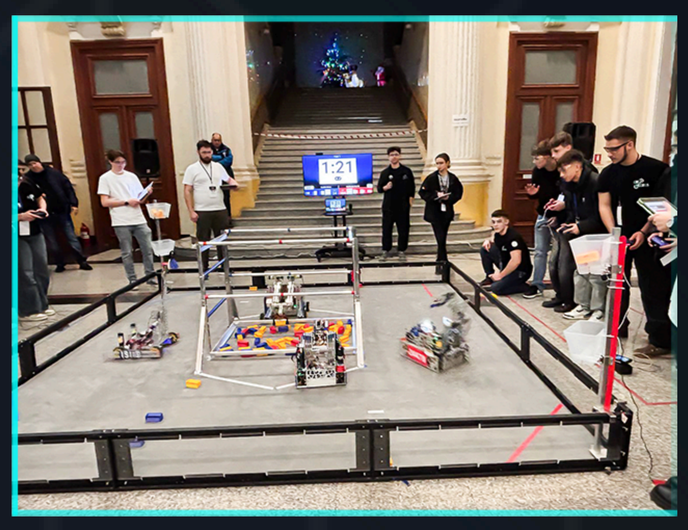
TECHTIDE OLTENIA MEET

We hosted the TechTide Oltenia Meet (January 4th to 5th) at the University of Craiova. This event was one of our goals for this season, so we are honored to have organized an opportunity to contribute to the growth and development of the FTC in our region. We collaborated with our trusted partner, SoftHoarders #12560, and ensured the event's success.





MENTORING AND ASSISTING - 2 TEAMS

With the knowledge and experience in FIRST gained from our previous season, we proudly volunteered to mentor two rookie teams: Solar Sparks #25871 and EngiNeerds NextGen #25916. Through this mentorship, we provided guidance on robot designs, offered advice on outreach efforts, and were always available to answer any technical questions they encountered. Globally, we've made efforts to help teams located even in Kazakhstan with ideas and knowledge.

PARTICIPATING AT "ORA DE EDUCAȚIE" BROADCAST ON OLT TV

We were honored to be invited to this broadcast, which features hardworking students, including Olympiad competitors, student council representatives from top high schools, and more. The show's mission is to promote education, innovation, and personal growth by encouraging open discussions about the guests' achievements. We had the opportunity to share our journey—how we discovered our passion for robotics, how our team was founded, and how it has grown over time. Additionally, we gave insight into how we welcome and support new members, helping them develop their skills and become valuable parts of our team.

OUTREACH

Motivating Students

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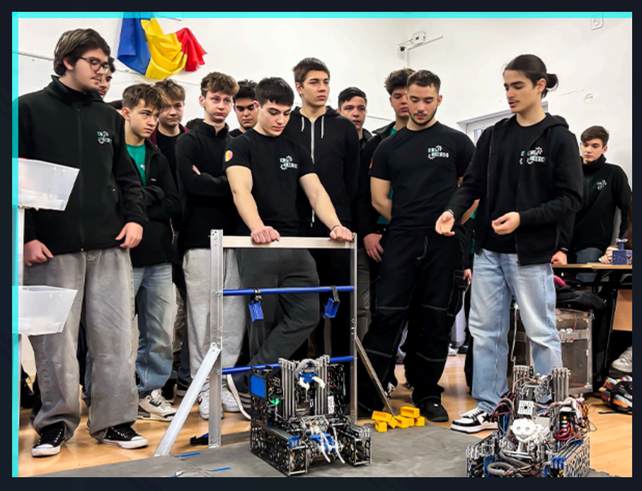
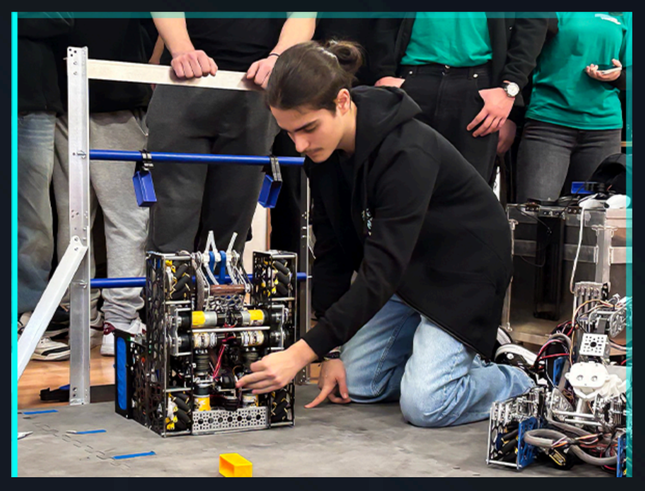
PROMOTING OUR WORK TO A MIDDLE SCHOOL

On Valentine's Day, our robotics team had the opportunity to visit “Eugen Ionescu” Middle School from our city, and share our passion for STEM.
We introduced the students to our team, explained how we design and build our robot, and demonstrated its capabilities. It was exciting to see their enthusiasm and curiosity as they explored the world of robotics. Beyond inspiring young minds, this outreach also helps us connect with potential future recruits who might one day become part of our team and continue our mission of innovation!



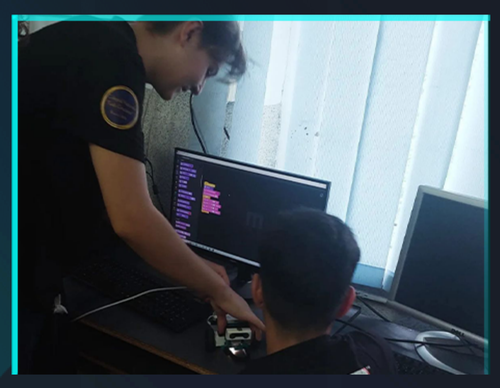


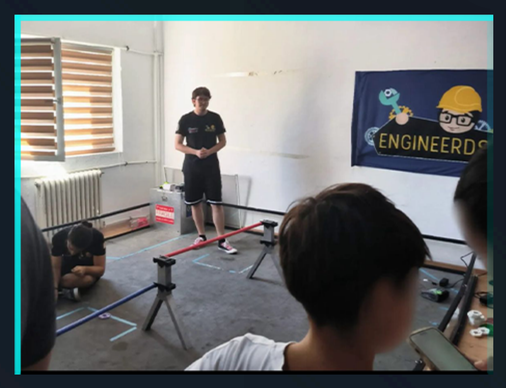
ENGINEERDS’ OPEN GATES ACTIVITY (AUGUST 2024)

Throughout August 8-14 2024, we organized an event in which we engaged with children of all ages through daily demonstrations of the team’s CENTERSTAGE robot. We actively showcased and communicated the core values promoted by FIRST and STEM, while aiming to inspire them to pursue careers in technology and innovation.

This activity was divided into two parts. The first one is for young children, for ages from 6 to 12, in which they have learned to built and program their own LEGO robots, and the second one is from 12 above, in which our most experienced team members explained the CENTERSTAGE robot in great detail, offering a great view of what being an EngiNeerds member is like in order to attract new members to join our team.

Through this experience, we have reached over 80 individuals, two of them now being motivated rookies in our team.





THE ROBOT

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ROBOT AND DESIGN OVERVIEW

IDENTIFYING

Identify the problem that needs to be solved/the objective

STRATEGIZING

Research and brainstorm possible solutions

DESIGNING

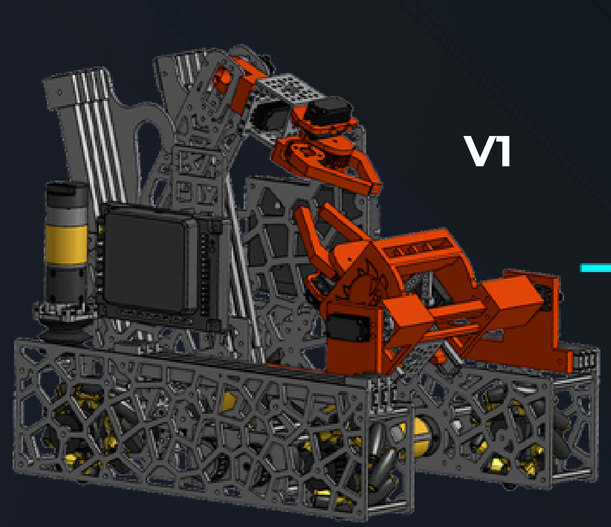
Design the best solution in 3D. We use OnShape to create most of our designs, but also Autodesk Fusion 360

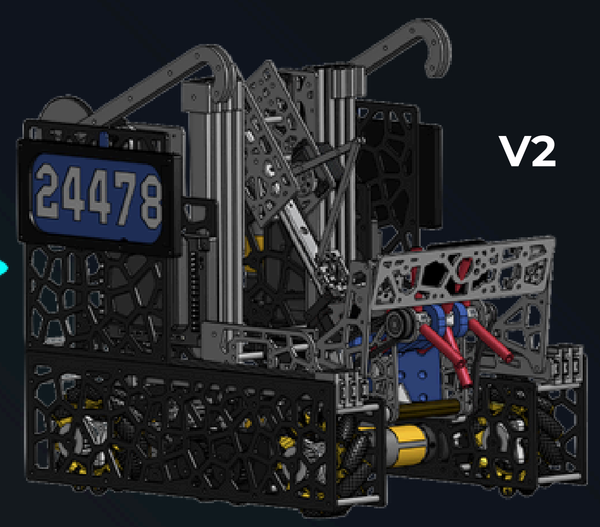
TESTING

Print the designed parts and test them to see if they work. This is when we identify the main design's problems and ways to improve it

ITERATING

Test and improve the design based on the information gathered by research and testing





REASON FOR REDESIGNING AND REBUILDING THE ROBOT

The sliders were placed diagonally, and when extended, they did not fit the extension limits. This realization has made us redesign the whole robot, taking this unpleasant situation as an opportunity to make our robot even better. We have also redesigned the intake, the outtake, the cable management to be neater, and overall the robot to be more organized.

CUSTOM MANUFACTURING

This year, we decided to fully custom-manufacture our robot, utilizing industry-leading platforms like CONTUR TECH. By incorporating pocketed aluminum plates on as many structures as possible, to make sure our robot remains both strong and lightweight.

THE ROBOT

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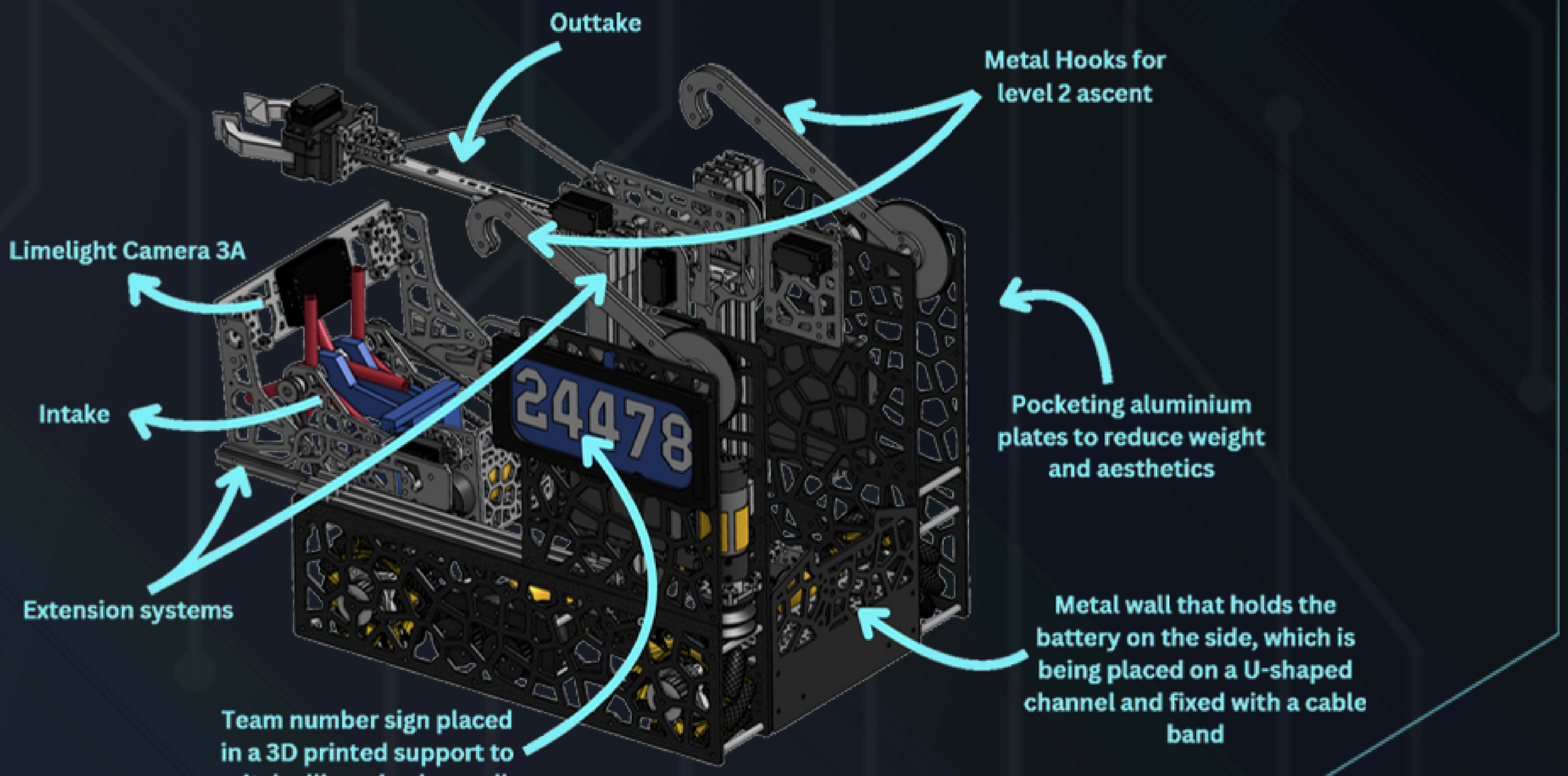
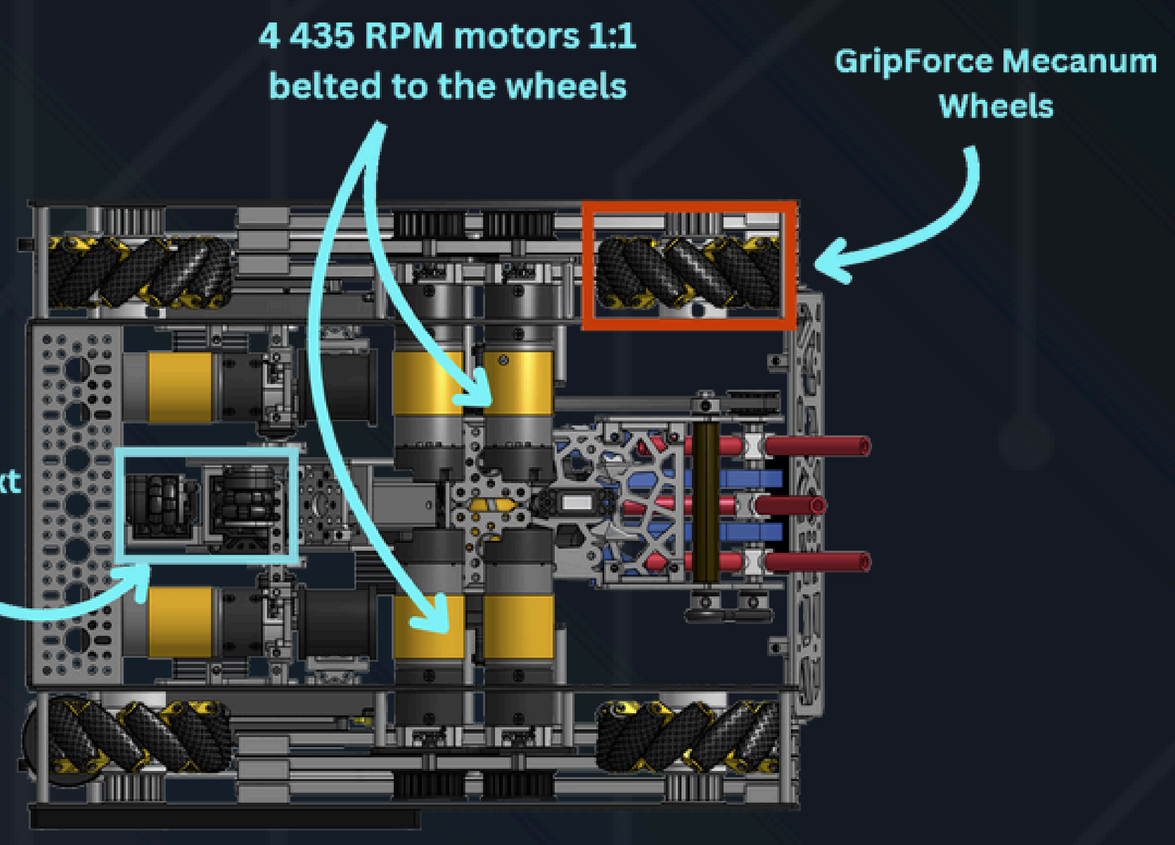
CLOSE-UP OF THE ROBOT



DRIVETRAIN

Manufacturing

The drivetrain is custom-made in OnShape and manufactured with the help of CONTUR TECH



MOVEMENT

Odometry Pods - We use them to localize the robot on the field, during the autonomous and tele-op periods.
Pinpoint Odometry - We have a GoBilda pinpoint placed above the odometry pods for easier tunning.
Mecanum Wheels - We use "GripForce™ Mecanum Wheels" from GoBilda and we use those to trouble our opponents during the game and for better localization in the autonomous period, as they reduce the slippage Mecanum Wheels usually have

THE ROBOT

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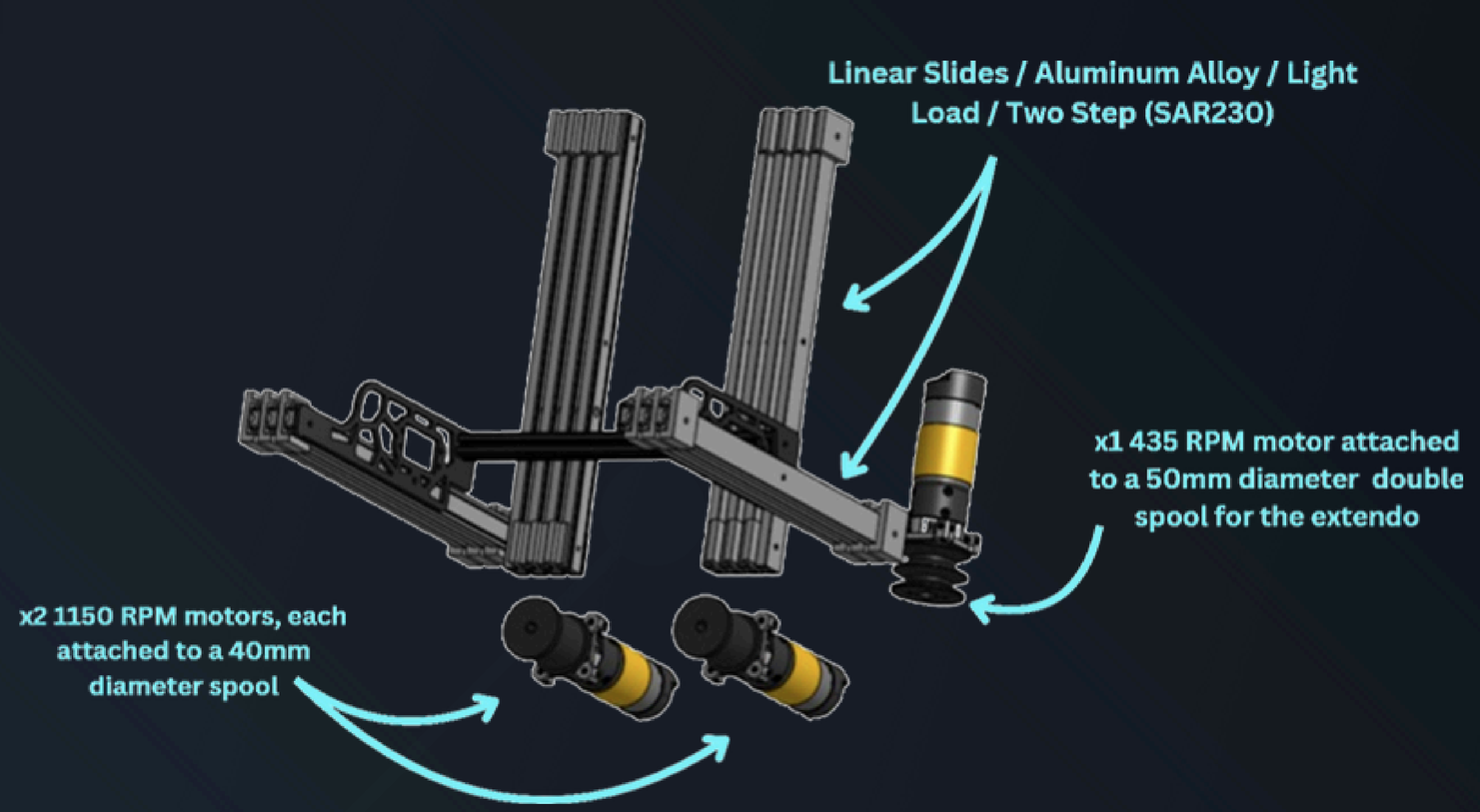
EXTENSION SYSTEMS



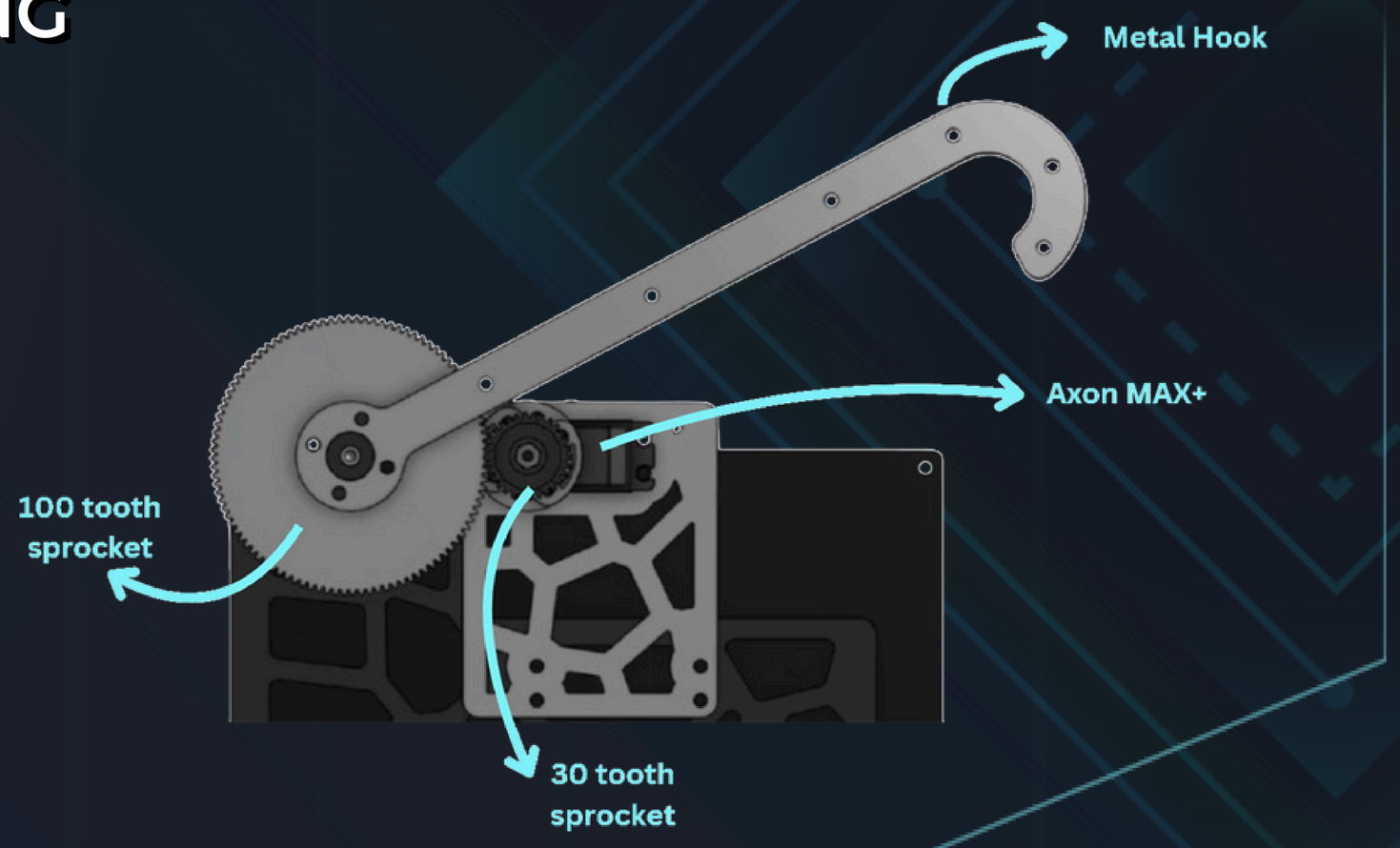
To power all these slides, we use custom-made aluminum inserts that help to strengthen the structure and reduce overall problems that 3D printed inserts would have. For example, breaking under high pressure and having to change them from time to time are problems we no longer have to worry about.

Vertical Extension - 2 sets of 4 SAR230 Misumi slides that support the outtake arm.

Horizontal Extension - 2 sets of 3 SAR230 Misumi slides that support the intake and camera holder. The horizontal extension is software-limited to fit in the extension limit from the Competition Manual, which is 109 cm.

HANGING

The hanger is made from two metal pieces merged together with screws, having between them two nuts. The hanger is placed with a 100 tooth sprocket next to a 30 tooth one that is connected to the Axon Max servomotor, which power is given by the servohub.



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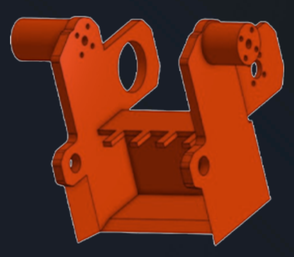
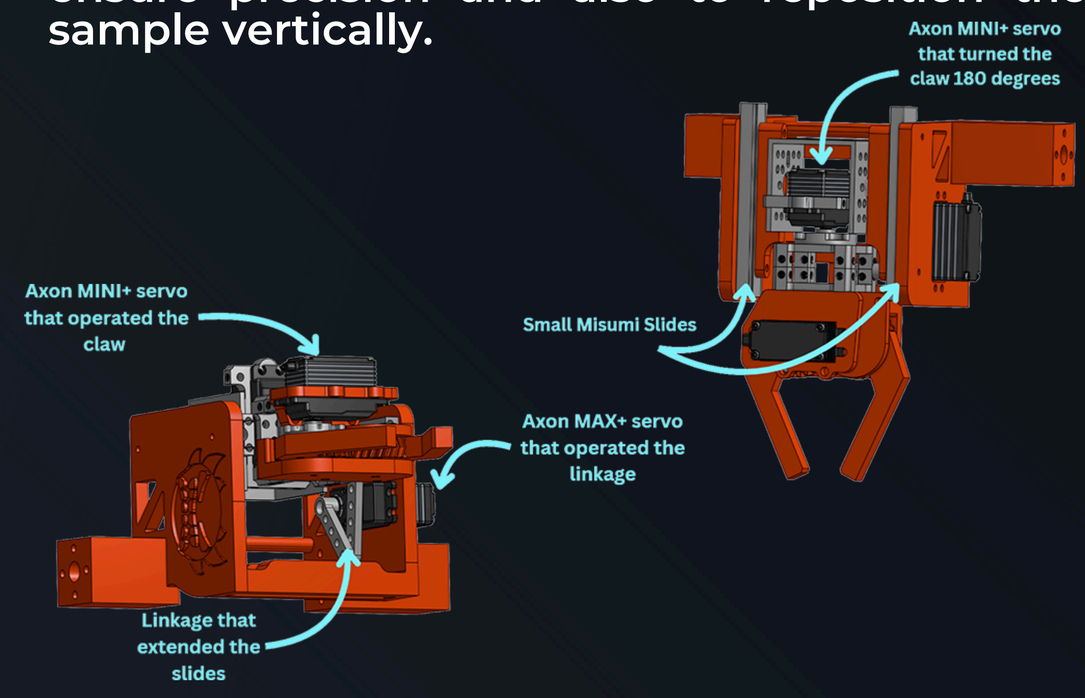
INTAKE

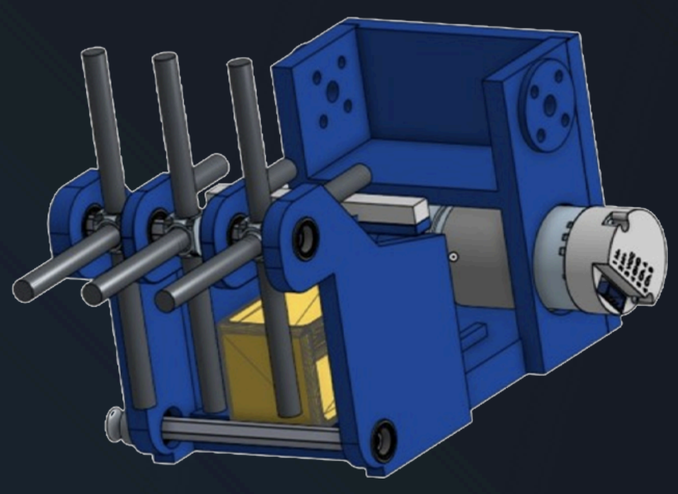


Intake V0 - This is the first prototype of the intake. We noticed that it regularly had issues with repositioning samples

Intake V1 - We switched to a completely different model, with a claw, to ensure stability to the caught sample. This version used an Axon MINI+ servo to spin the claw 180 degrees, and an Axon MAX+ servo to operate the linkage of the small Misumi aluminum slides that held the claw. It also used an Axon MINI+ servo to open and close the claw, which was very prone to breaking. Thus, to make the intake stronger, when we rebuilt the robot we switched to the first model, but smaller to ensure precision and also to reposition the sample vertically.

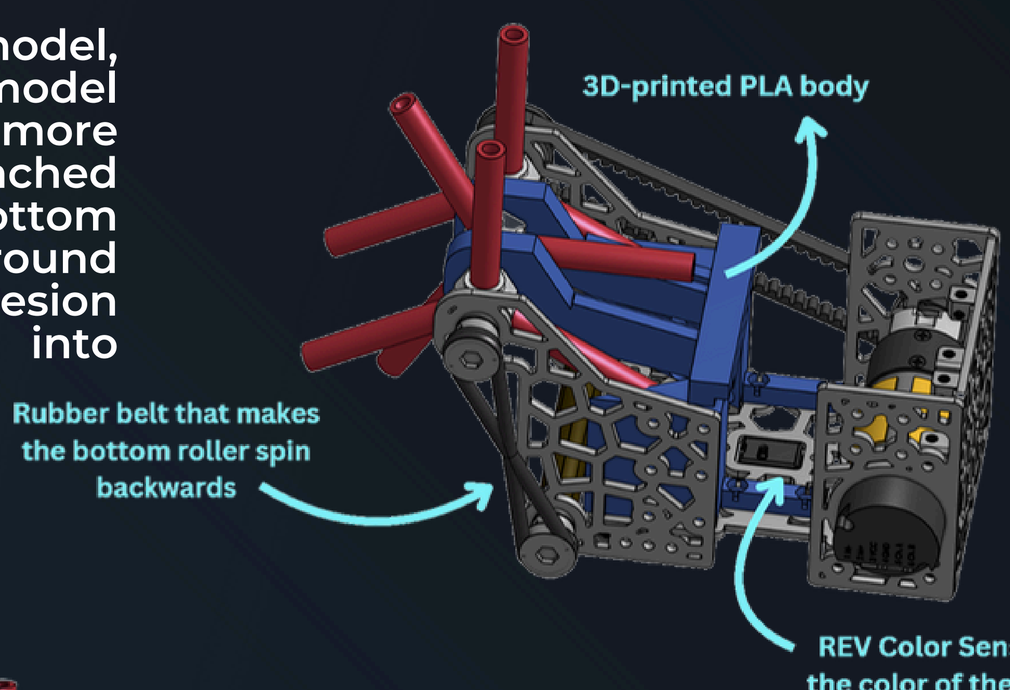


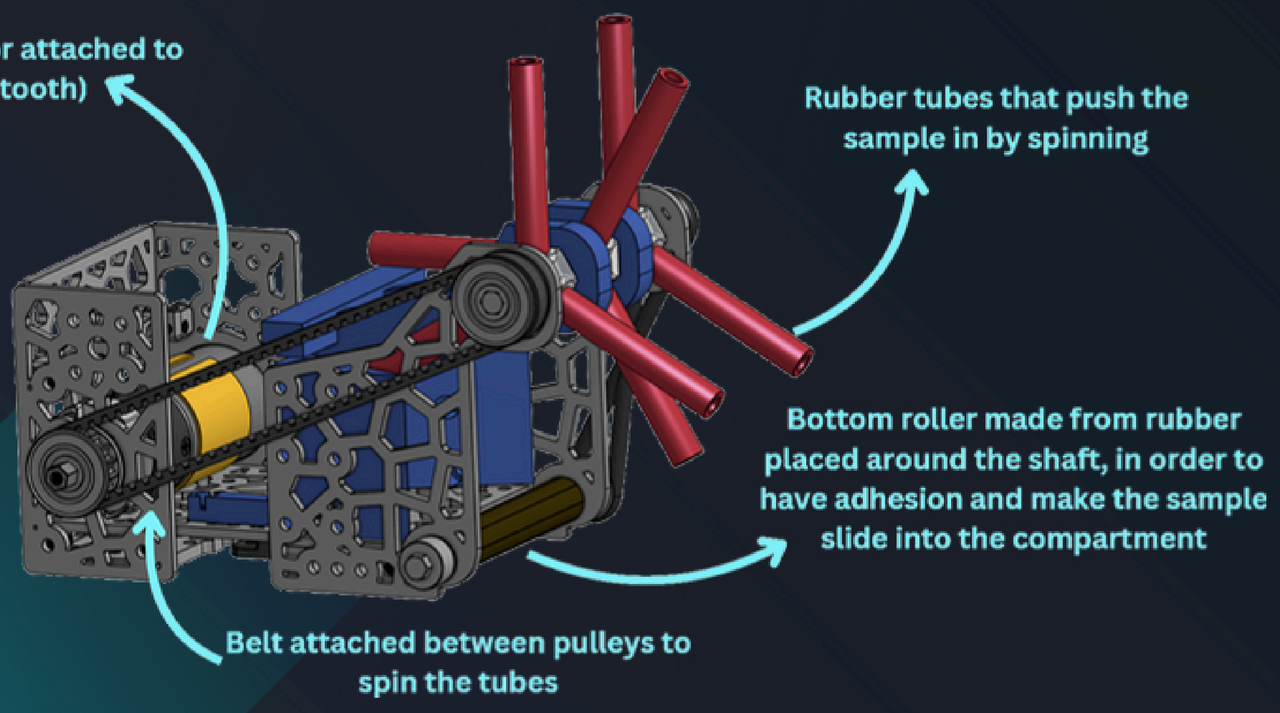
Intake V2 - This version worked very well, but the fact that it was 3D-printed did not ensure durability and was prone to breaking under high pressure. So, even though the chance of it breaking was very small, we rebuilt it from metal.



Intake V3 (the actual model)

It works the same as the third model, but we switched the 3D-printed model to a metal one because it is more durable. It used silicone tubes attached to 3D-printed supports and a bottom roller made from rubber placed around the shaft, in order to have adhesion and make the sample slide into the compartment.





THE ROBOT

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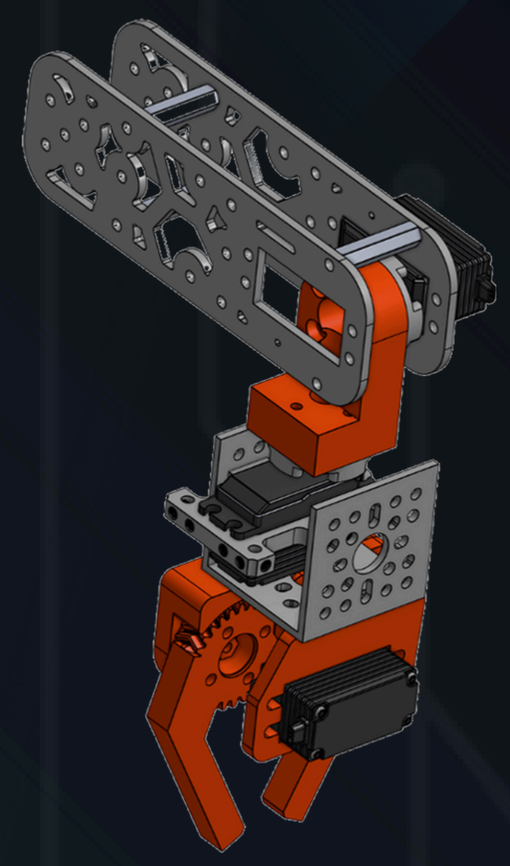
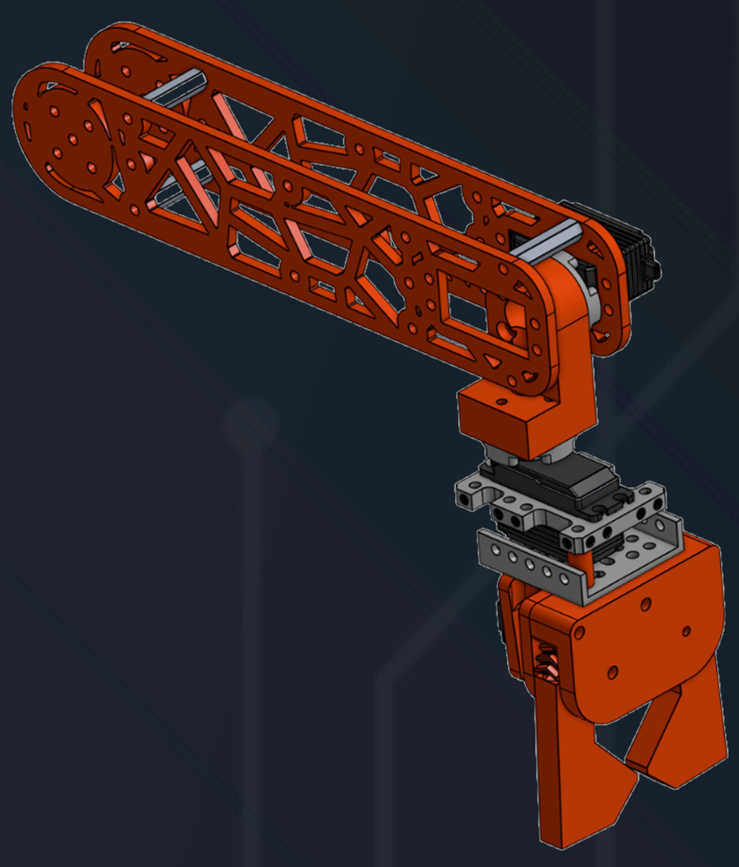
OUTTAKE - V0 TO V2

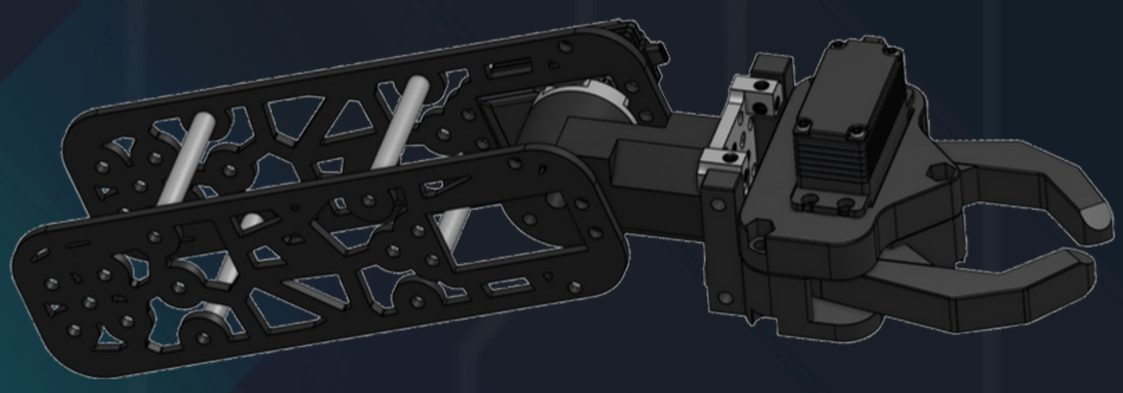


Outtake V0 - The first prototype of the outtake worked very well overall, the claw part was built the same way as the second version of the intake. It used an Axon MINI+ servo to open and close the claw, another Axon MINI+ servo to spin the claw 180 degrees. The reason we changed it is to ensure efficiency in the autonomous period.



Outtake V1 - This model was made to be more effective by making the arm longer and changing the shape of the claw fingers to be triangle-shaped, in order to ensure stability to the sample. It functioned the same as the first model, but did not fit the third version of the intake. When the robot was rebuilt and we changed the intake, we also had to change the outtake.

Outtake V2 - It is a more compact and simple model. In comparison to the other two versions, this one does not have a servo that spins the claw 180 degrees. We also changed the claw fingers, making them as slim as the first prototype and more arched than the first prototype. It was made for the actual intake, so that the transfer of samples between the intake and the outtake could take place easily.



THE ROBOT

ENG NEERDS #24478

OUTTAKE - FINAL VERSION (V3)

COMPARISON OUTTAKE V2 - OUTTAKE V3

OUTTAKE V2

1. It used an Axon MAX+ servo to move the claw up and down.

2. It was restricted by its size, but still worked very well.

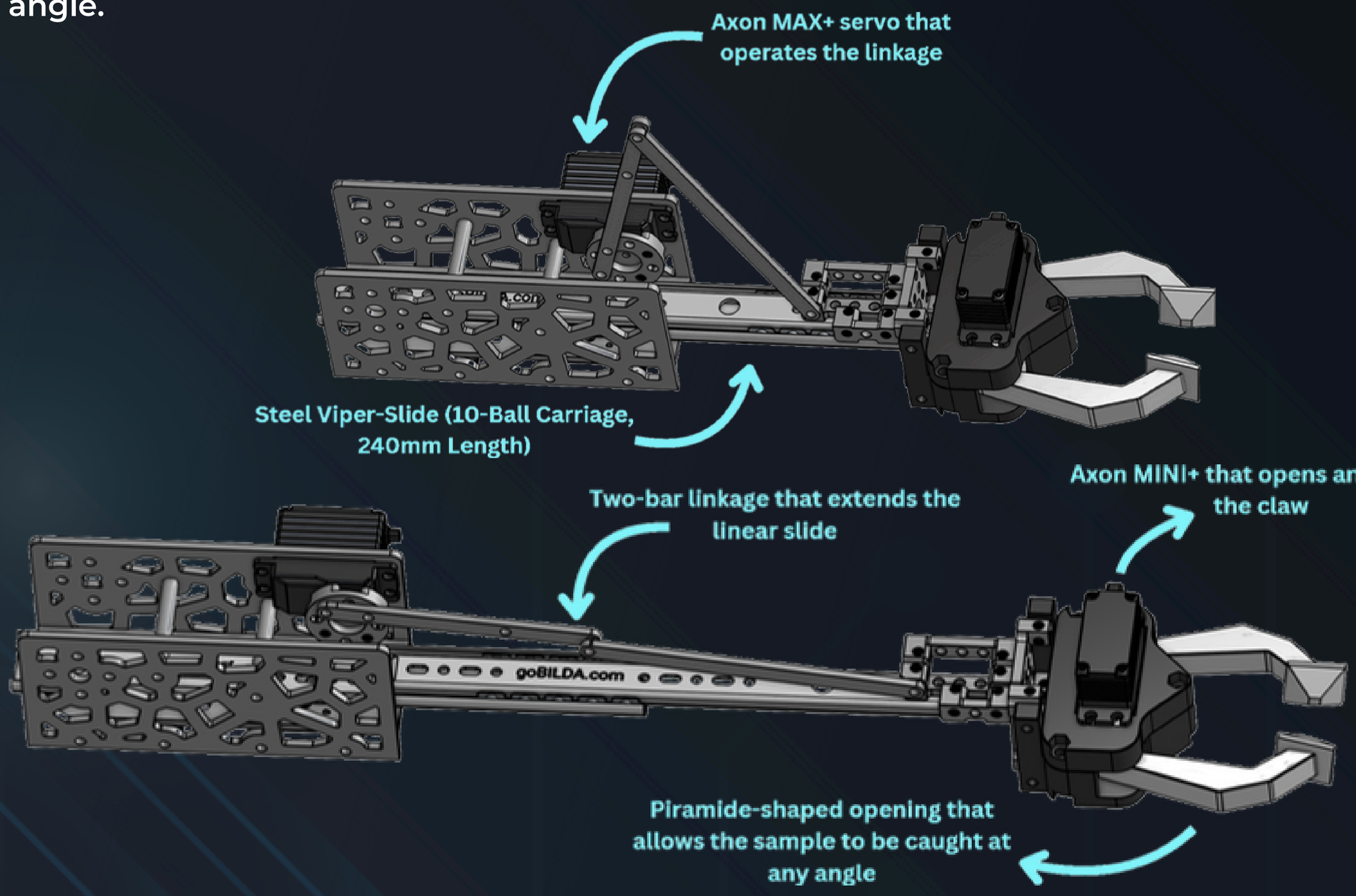
3. The claw fingers were slim and arched, which made the sample to be caught easily, but it had a slim chance of dropping the sample, depending on the angle.

OUTTAKE V3

1. It uses an Axon MAX+ servo to extend the arm.

2. It can extend depending on the task so it becomes more efficient.

3. The claw fingers are slim, the opening being piramide-shaped to ensure that the sample is caught at any angle



Claw Fingers Moving Mechanism

For moving the claw fingers, we used in all prototypes herringbone gears at the base, one of them having a Axon MINI+ that moved both of them symetrically by the use of this mechanism.

SENSORS & LOCALIZATION

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PIDF CONTROLLERS

- A **PIDF controller (Proportional-Integral-Derivative-Feedforward)** is what is known as a "closed-loop" control system.
- Adjusts the power of our motors based on real-time feedback from previous actions in order to achieve a more precise movement of our slider systems.
- The **proportional** term makes sure a system's current position correctly aligns with its target position;
- The **derivate** term, also known as a dampener, is used in order to prevent overshoot;
- The **integral** term, is used lightly in order to fully prevent any system error;
- The **feedforward** term corrects for system disturbances and other external factors such as gravity.

VOLTAGE SENSOR

The **REV Control Hub's internal voltage sensor** is used in order to boost the accuracy of our TELEOP subsystem functions.
- Automated autonomous program switching based on battery voltage reported by the Control Hub's voltage sensor in order to ensure accurate intaking of SAMPLES and safe placement of a SPECIMENS.

COLOR SENSOR

A **REV Color Sensor V3** is used in order to differentiate between SAMPLE colors and make sure the SAMPLE has correctly been deposited
- Robot automatically ejects a wrong color SAMPLE from the intake
- Checks distance in order to ensure that a SAMPLE is in the deposit when initiating a transfer sequence.

FIELD LOCALIZATION

Robot localizes (tracks its position on the field relative to an arbitrary starting point) using both absolute and relative methods of localization. Absolute localization returns a fixed value, whilst relative localization acts as a tracker, measuring robot movement continuously. We use a combination of both types of localization in order to ensure accurate tracking during both the AUTONOMOUS and TELEOP periods.

ODOMETRY PODS

- **Odometry Pods** are dead omnidirectional wheels hooked up to an external encoder that measures the robot's position, in ticks per revolution, on an axis relative to a starting point.
- Two Odometry Pods are used in order to measure robot movement on both the x-axis and y-axis of the field.

PINPOINT COMPUTER

- During AUTONOMOUS, we use the GoBILDA Pinpoint co-processor, alongside 2 GoBILDA 4BAR Odometry Pods.
- The **GoBILDA Pinpoint Computer** runs positional calculations independently from the Control Hub, thus ensuring precise localization on the field. The Pinpoint computer runs at approximately 1500hz (1500 calculations per second), compared to around 50hz when processing calculations internally (on the Control Hub)
- Pinpoint also contains what's known as an internal IMU (Inertial Measurement Unit). We use the IMU's gyroscope function in order to measure our robot's heading on the field.

LIMELIGHT 3A CAMERA

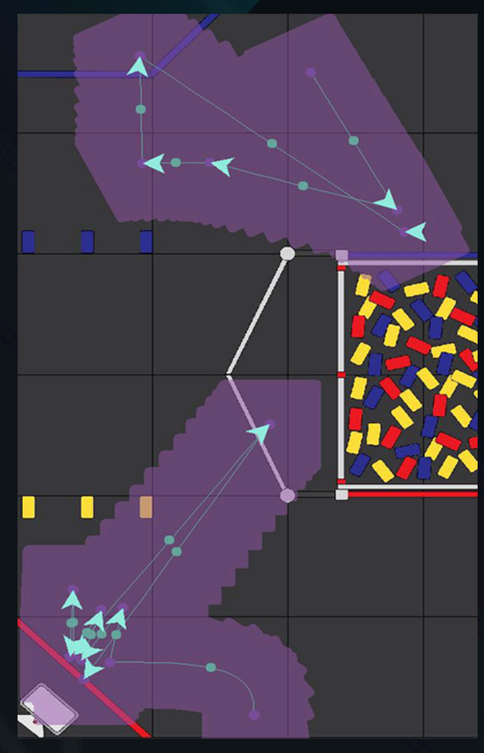
- A **Limelight Camera** running an HSV Color + Edge Contour detection pipeline (program) is used to detect SAMPLE locations in the field.
- Using image homography, the camera accurately tracks the SAMPLE position and angle relative to the robot. Then, by converting the pixel distance to encoder ticks, we make sure our robot's extension runs to the SAMPLE intaking position determined beforehand.
- The camera is used for SAMPLE angle re-localization in concordance with the Pinpoint Computer during the autonomous period of the match.
- Besides re-localization, we make use of our detection model in order to detect another SAMPLE at the start of autonomous & get an additional SPECIMEN on the high chamber.

AUTONOMOUS & TELE-OP

ENGINEERDS #24478

PEDRO PATHING (LM1)

- For our first League Meet, we used **Pedro Pathing**, a robot pathing & following algorithm.
- Pedro Pathing is a GFX (Guiding Vector Field) algorithm. It works by generating a set of directional vectors that guide the robot along a predefined path. Thus, it adapts to external disturbances and path deviations caused by aggressive robot contact.
- This path-following algorithm is rather inconsistent though, prioritizing raw speed over robot field accuracy.



RRPATHGEN

- **RRPathGen** is a Java program that allows us to easily generate paths for Roadrunner. We use it to test our autonomous programs before running them on actual hardware.

ROADRUNNER (LM2+)

- Later, we moved on to **Roadrunner 1.0**, an open-source motion profiler.
- The main advantage of a motion profiler is that it prioritizes localization accuracy and time consistency over speed. Using Roadrunner, we make sure that subsystem actions run at the same time, every time.
- Roadrunner also runs 3 additional drive motor PID control loops for accurate positional tracking, one for robot heading and two for x and y-axis control. This way, the robot corrects itself throughout the path.
- In order to relocalize on the field using our camera, we modified Roadrunner's default follower in such a way that it allows us to automatically change the robot's pose based on output data from our camera.

COMMANDS & SUBSYSTEMS

- Our code architecture is structured around **commands and subsystems**, ensuring a modular approach to robot control.
- In order to structure our code in such way, we use an external java library called **FTCLib**. Using FTCLib is a great way to improve code structure, as the library provides an in-built, easy-to-use command system.
- We define a sequence of commands that allow us to break down complex actions, such as our transfer, into reusable tasks. This makes it easier to improve or fix specific robot actions without disrupting the rest of our codebase.
- Each controllable part of our robot is separated into its own subsystem in order to improve code organization and maintainability. This ensures a great level of independence (if one subsystem has issues, the rest of the robot can remain functional) and allows for parallel execution of multiple actions, therefore improving efficiency.

TELEOP ENHANCEMENTS

Automatic Transfer & Ejection

- A REV Color Sensor V3 is used in order to automatically eject wrong-colored SAMPLES and initiate the transfer sequence.

SLIDER PIDF DEACTIVATION

Our **slider's PIDF controllers** automatically deactivate when not used, thus extending our robot's battery life by a substantial amount.

AUTOMATED SPECIMEN CATCHING

We make use of Roadrunner pathing during TeleOp in order to fully automate our specimen-catching sequence. Our driver presses a button from anywhere across the field, and the robot automatically moves, detects & catches the SPECIMEN in the human player zone!

AI Assistance Acknowledgment:
This portfolio was created and written entirely by the EngiNeerds team. To improve clarity, structure, and wording, AI-based tools such as ChatGPT were used as writing aids. All technical content, design decisions, and engineering solutions were documented, tested and developed by our team members.

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WHERE INNOVATION MEETS COMPETITION

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