THE FLYING

DUTCHMAN

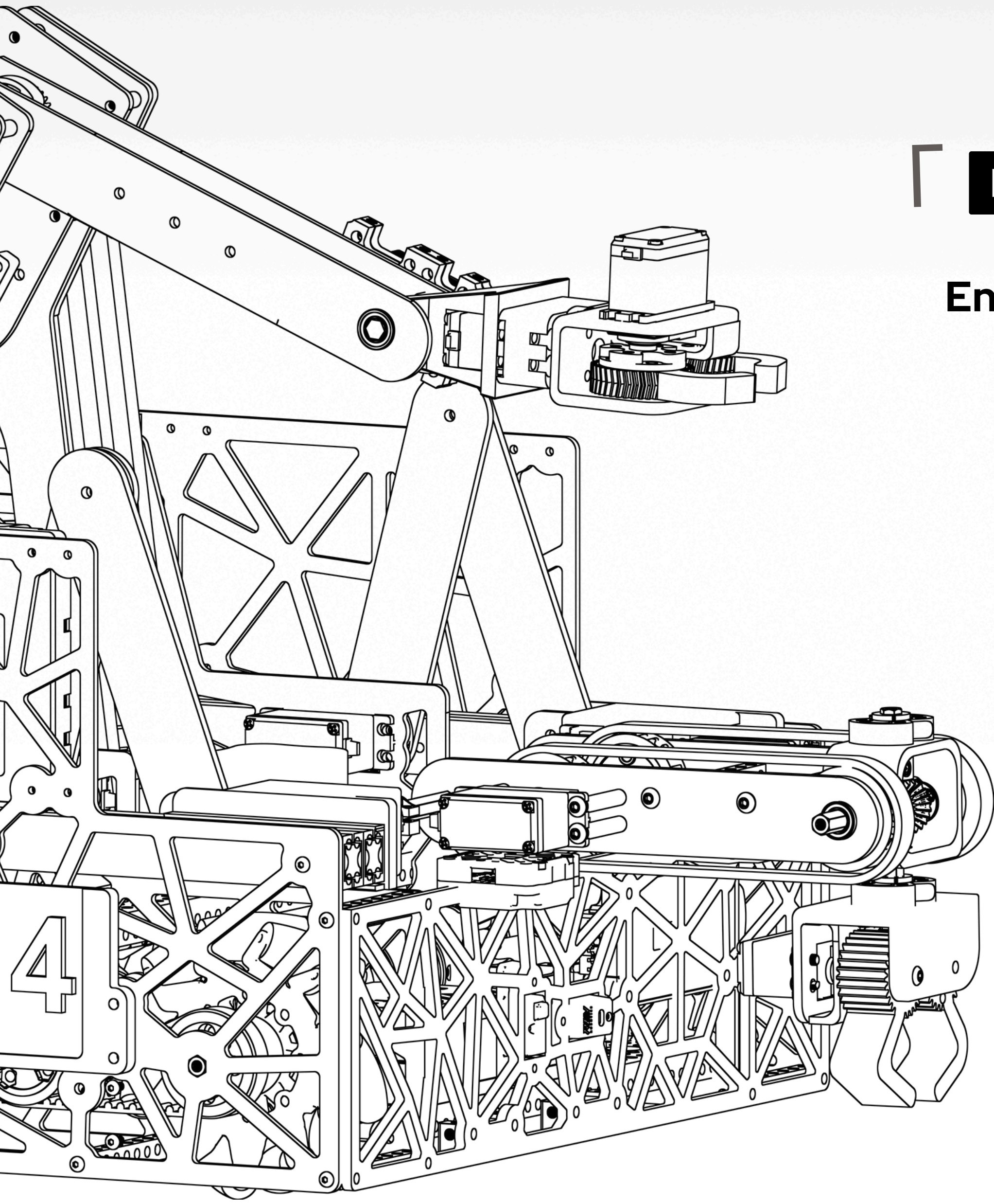
— TEAM 23014 —

Presents

「DELTA」

Engineering Portfolio

2024-2025



American School of The Hague

goBILDA

slideshare

Touchcast

esa

GENE HAAS FOUNDATION

AUTODESK

leidos

ASCENT SECURE

FIRST TECH CHALLENGE

INTO THE DEEP

PRESENTED BY RTX

We're **Team #23014**

We are The Flying Dutchman, a student-led team of 15 motivated high schoolers who compete in competitive robots while educating our local community and spreading the message of FIRST. With involvement from 11% of our high school population, we aim to inspire the next generation to the world of STEM.

Meet our mentors

Mr. Pratt
Robotics Teacher & Serial Collector of Skills

Mr. Schlesselman
Computer Science & Physics Teacher

Mr. Hansen
Middle School IT & STEM Teacher

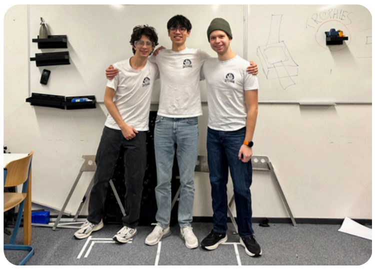
Meet our departments

Mechanical Engineering

Our MechE team focuses on the planning, CADing, prototyping, and assembling the season's robot.

Software Engineering

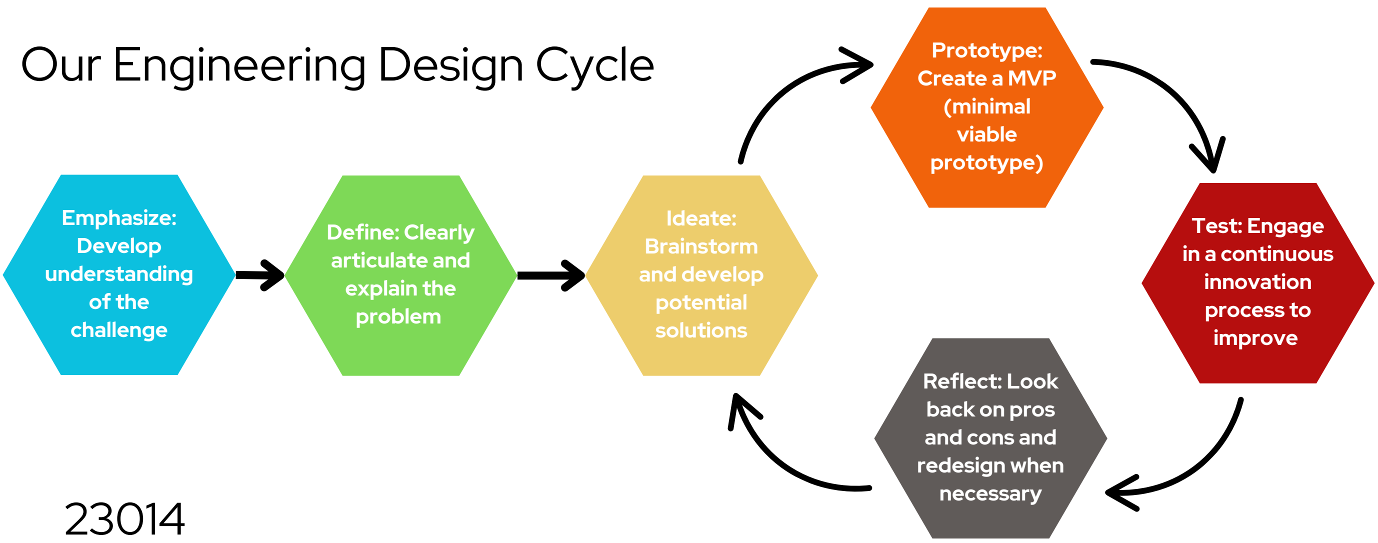
Our software team focuses on the coding, wiring, and electronics of the season's robot.



Business and Procurement

Our team takes care of social media, team merchandise, budget, brand identity, and the procurement of parts and materials.

Our Engineering Design Cycle



Motivate - Projected Timeline

Phase 1 (Off Season)
(March - September)

Goals: Developed coding and CAD skills in the offseason. Analyzed mistakes from previous season and designed a new custom drivetrain.

Accomplishments: Our team accomplished all tasks that we set out to do during this timeframe.

Phase 2 (MVP's)
(September - November)

Goals: Analyse the game and strategy of this season. Start brainstorming, CADing designs, and building MVP's to test.

Accomplishments: Managed to CAD the robot completely and build a functioning design for our first scrimmage in which we came first place.

Phase 3 (Driver Prep)
(November - January)

Goals: Start intense driver practice and coding. Keep making iterations on the robot and prepare for qualifiers.

Accomplishments: Programming worked on autonomous and drivers practiced TeleOp period. We prioritized driver practice and TeleOp over re-iterating as it would accomplish more.

Phase 4 (Finals Prep)
(February - April)

Goals: Qualify from qualifiers and Benelux Championships. Install a vision camera (Limelight 3a) and make new iterations on our robot.

Accomplishments: We qualified from both qualifiers and Benelux Championships. Also made new iterations including the camera.

Our Future Goals

Our primary goal is to expand our CAD and design knowledge, applying more engineering principles, math, and physics in our designs as we iterate and plan. Our ultimate goal would be to qualify for the FIRST World Championship in successive years. In the far future, we would like to host the Benelux Championships at the American School of the Hague.

Team Partners

Gene Haas Foundation, American School of The Hague, slideshare, esa, Autodesk, Touchcast, leidos, Ascent Secure, goBILDA

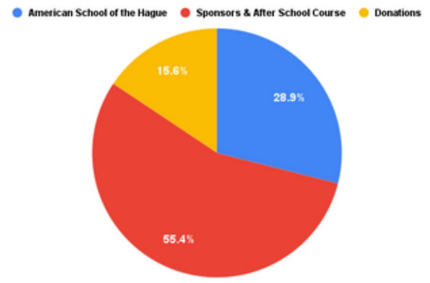
Motivate - Financial Organisation

Team Account Balance

Income	Expenses
American School of the Hague: €4460	Registration fees: €2595
Sponsors & after school course: €8540	Total parts cost: €8286.55
Donations: €2407.50	Equipment & tools: €3193.54
Total: €15407.50	Total: €14075.09

€15407.50 - €14075.09 = Net Balance: €1332.41

Sources of Income



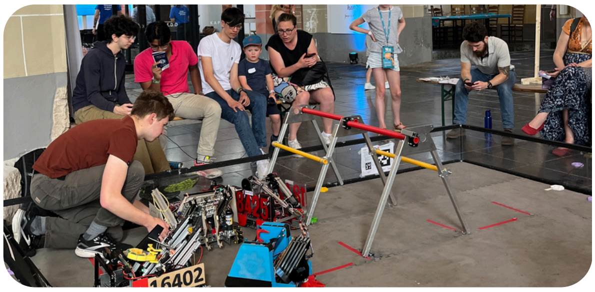
Motivate - Outreach

In Nagarkot, **Nepal**, we spent a week at the Sanjeewani School teaching STEM concepts to kids aged 4–12. We engaged the students with fun, interactive activities such as exploring biology in nature and learning math through block games. These hands-on experiences introduced them to a new way of learning beyond textbooks. Our goal was to inspire the children with the spirit of STEM and education, enabling their curiosity and excitement for learning.

We had the opportunity to host two local **Girl Scout** troops in our robotics lab, introducing them to coding, FIRST Programs, and the exciting world of STEM, as well as teaching the basics of FTC and programming. We held a presentation to teach them about the basics of coding, relating it to recipes, along with time to drive the robot.

At our school's **International Day**, we let young engineers make simple code on micro:bits, hoping to inspire local children and spark their excitement for STEM and robotics. We also fundraised €320 for parts, specifically for new motors, and showcased our robot in a booth to the local community.

At the **Expeditie NEXT Science Fair in Zutphen**, we showcased our robot at the FIRST Tech Challenge booth to 1,200+ attendees. We gave young visitors the chance to control our robot on the FTC field. After the event, we joined fellow FTC and FRC teams for dinner, building relationships and exchanging ideas within the community.



At our elementary school, we **exhibited our robot** to ~400 children from kindergarten to 4th grade in two assemblies, introducing them to the world of robotics, STEM, and FIRST; we taught them about key team values such as teamwork and gracious professionalism.

Motivate - Outreach

During our school's **Back-to-School bASH** event, we organised a booth aimed to introduce children to the excitement of robotics by programming our robot to move in response to their controls within Minecraft. The bASH was a success, and we also took this opportunity to gather interest in our After School Robotics Course for the kids. In total, we gathered more than 30 interested families to participate and learn more about the wonders of robotics.

We partook in the **Delft Innovation Day**, allowing kids to drive the robot in Minecraft along the game field. This was an amazing experience and invitation by TU Delft and was a great way to show off FIRST and FTC to the younger generations.

We partook in the our school's **Elementary School Science Day**, where we brought our robot and created a path that the kids could drive along. We hoped to interest the kids in STEM fields and robotics, teaching them about engineering and design while creating a fun and memorable experience driving the robot.

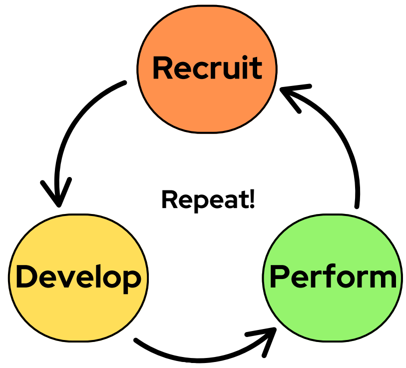
We designed and launched an engaging **after-school robotics program** for 14 kids from age 7-11 in our school. In the ten-week program, students delved into different aspects of robotics, no matter their prior experience:

1. Engineering Principles: The students in the course were challenged to develop critical thinking skills to solve various engineering riddles and exercises, such as the Wolf, Cabbage, and Goat problem and the Spaghetti and Marshmallow Challenge.
2. Coding Basics: Our team introduced students to the micro:bit and the MakeCode block coding environments. Starting with simple output through the screen and input with the buttons, we slowly expanded the students' knowledge to wiring and coding both continuous and positional servos.
3. Simple Building: The students started off the course with Lego Technic, where students built a car that moves down a ramp, using only connectors, axles, beams, and wheels. As their skills advanced, they combined their programming ability with building techniques to build a moving inchworm out of cardboard and a positional servo.
4. Final Project: At the end of the course, the students combined their knowledge of robotics to assemble and code a car made out of laster-printed material, micro:bits, and continuous servos.

Motivate & Connect - Development

Team Goals

Team	Goals
Mechanical Engineering	• Improve CAD Software skills to speed up iteration proccess. • 3D print and laser cut custom mechanisms that allow us to be more flexible in the design process. • Employ more advanced mechanisms to compete at higher levels.
Software Engineering	• Use standardized libraries that have been tried and tested. • Make the robot's paths more consistent • Improve documentation to refine communication.
Business and Procurement	• Recruit new members through in-school activity fair. • Build a social media presence & brand identity. • Initiate & design the engineering portfolio. • Establish team spirit & positive working environment.



Connect - Mentorship

We had **Jim Heigle**, a systems engineer, give us a presentation on the usefulness of **risk management**. During the presentation, we learned the risk management process.

- Identify risks
- Assess/score/prioritize tasks
- Identify mitigation steps
- Document risks

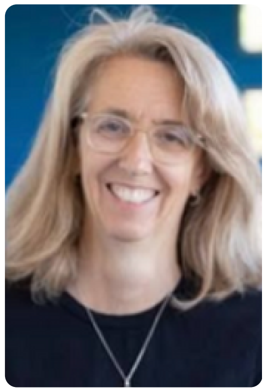
Main takeaways of the team from the presentation:

- Risk management is a team effort
- It encourages rational and calculated decisions

We used this process greatly when thinking about next steps after our first scrimmage in November.

On September 25th, we were fortunate enough to be invited to visit the European Space Agency, hosted by Martin Azkarate (Robot Navigation System Engineer), Orson Sutherland (Directorate of Science), and Cristina Hernandez (Directorate of Human and Robotic Exploration). At **ESA's Automation & Robotics Laboratories**, we explored a potential Mars planetary robot, gaining insight into its intricate design and engineering. We also visited the **Orbital Robotics lab**, featuring an ultra-flat floor for zero-gravity simulations used to test and refine robotic mechanisms. Additionally, we had the chance to ask questions and control the Mars robot in a simulated environment, making the experience both interactive and highly educational for our build and programming teams.

Corrine Kohlmeyer-Hyman (Marketing Specialist) gave us a presentation about fundraising and generating revenue. In addition, she gave us a masterclass about building a brand identity, providing insights into logo making and T-shirt designs. Her advice was key to **building a successful presence** in the FTC community.



Ainhoa Gorriti (Sales Engineer at Antenna System Solutions · Senior researcher (PhD.)) came in to talk to us about how Antenna System Solutions designs an anechoic chamber using the restraints of the customer. She showed us all of the steps needed to prepare for the building of the chamber to make sure all of the specifications were met, beginning more than 6 months before the building had begun. All of these steps showed us how vital it is to make sure the planning and design are strongly understood before actually getting to the robot, influencing **our philosophy to CAD any design** before building.

Connect - Community

We had a **Dream Team from TU Delft** called Forza Hydrogen Racing visit our school and bring their Forza VIII car from 2019. The team taught us more about the **engineering process** and how **hydrogen cars** might work in the future. We also **invited them** to our FTC room to tell them about FTC, and to show them our robot in action while getting ideas and tips about our robot from the team.

During the winter, we graciously **mentored** Team #28321 (London Academy of Excellence) from the United Kingdom. We answered their questions about starting an FTC team from scratch and building sufficient funding.

On the 9th of December, 2024, we were fortunately able to **invite, host, and work** with 3 FTC teams from Germany (#10183, #12463, #20092). During this meeting, we showed the other teams our bot and what FTC is like at our school. We were able to **exchange valuable ideas, insights, and tips** in terms of our robot and this year's game, while building friendships with the members of the visiting teams.

In the week of January 13th, we were able to to **host and work with** the Lithuanian FTC team, LITBOT (#24500). Together with LITBOT, we **exchanged invaluable ideas, strategies, and insights** on Into The Deep, while performing driving practice together for our upcoming Qualifying Tournament.

All season long our business team was hard at work, growing our **social media** presence and spreading knowledge about FIRST and FTC.

Followers: 1,200
Total Views: 124,806
Most viewed video: 27,500

Game Strategy

To develop our strategy, we started by brainstorming all potential routes and analyzing their maximum possible point values. To identify the most effective approach, we conducted human trials of each route, repeating each one three times, and calculating the average point totals. We then put together a spreadsheet of data and created a matrix of possible outcomes. Through this process, we determined that the mixed strategy (high basket + high specimen) was the most effective, achieving an average of 154 points per match.

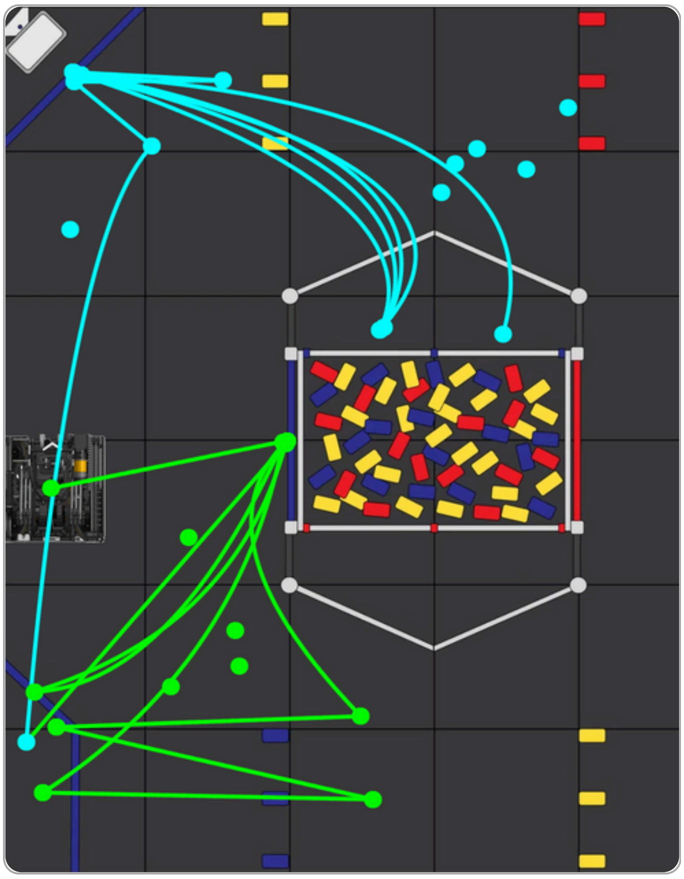
Our "Mixed Strategy" Structure

Autonomous
- Place 4 pre-loaded specimen on High Rung
- Push 2 team-color samples on the ground into the Observation Zone
- Cycle specimen from human player in Observation Zone to the High Rung

TeleOp
- Cycle yellow and team-colored samples from the Submersible to the High Basket

Endgame
- Cycling remaining Basket
- Level 2 Hang

This strategy allows us to use our robot to its full potential, scoring 83 points consistently in Autonomous, 50 points in TeleOp, and 15 ascent points in Endgame.



Versatility & Flexibility

We realized that one route wouldn't work for every match due to the unique capabilities of our alliance partners. To address this, we designed our robot to be adaptable in three distinct strategies:

1. **High Specimen Cycling:** Used when our alliance partner is efficient at high basket sampling.
2. **High Basket Sampling:** Applied when our alliance partner excels at high specimen cycling.
3. **Mixed Strategy:** When the alliance partner is capable of handling both tasks.

Think - Scouting & Maintenance

Scouting and Analysis

We implemented a **comprehensive scouting system** during scrimmages and Twitch-streamed events using Google Forms and spreadsheets. Each member focused on **analyzing one competing team**, recording total points, distribution of points by category, strengths, and weaknesses. This data allowed us to **identify trends and gaps** in our competition and **informed our preparation** for the **Qualifying Tournament.** It also allowed all members of the team to contribute, even if they weren't on the field.

Maintenance

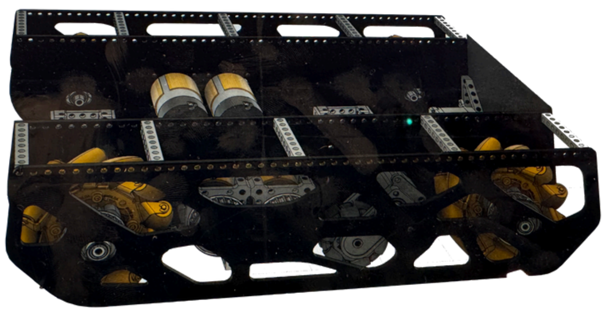
A problem that we encountered early in the season was maintaining the robot, especially screws and components in tight spaces. To solve this problem, we created multiple holes in the chassis of our robot that would give us easy access to help with the maintenance. These holes were implemented in places such as the outtake claw plates where the screw of the gear would routinely come loose and need fixing.

Think Design - Robot iterations

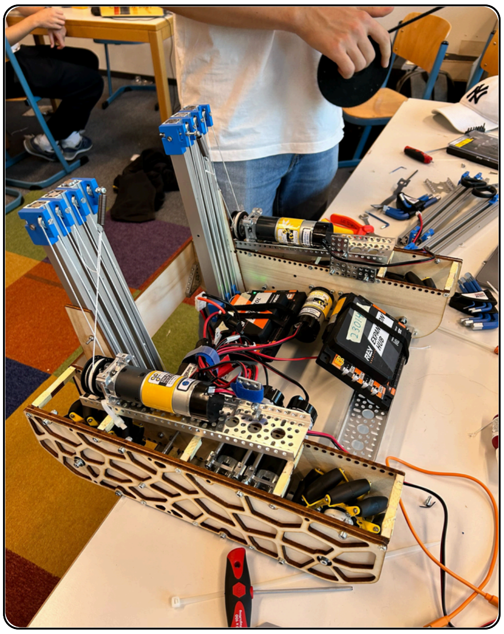
Iteration 1 - Initial Drivetrain

Basic drivetrain, using four goBILDA motors, powering a belt drive system. It had two side plates for protection of the wheels, and it had a back plate and bottom plate that would help hold the robot together.

1. Pros: It was lighter than a normal goBILDA strafer drivetrain and was more customizable.
2. Cons: No use for a bottom plate as the connection between the two sides of the robot was too unstable.



Think Design - Robot Iterations



Iteration 2 - Outtake v1

We used three sets of **Misumi SAR330 slides** on each side, attached together with a **lightweight 3D print**. The motors were situated on top of either side of the drivetrain. These motors powered both the retraction and extension string in one pulley.

Pros: Placing two or three specimen per match.
Cons: Problems with the rigidity and belt slippage. The linear slide retraction string was angled, causing strain on the lifting mechanism.

Iteration 3 - Intake v1 + Outtake v2

Outtake Claw Design:

- Two 3D-printed attachments inside the slides.
- Included a claw to pick up specimens

Active Intake Design:

- Used three rollers to move samples upward into the robot.

Linear Slide Gear Ratio Derivation

Given a driving gear with 16 teeth and a driven gear with 24 teeth, the gear ratio is:

$$\text{Gear Ratio} = \frac{16}{24} = \frac{2}{3} = 1.5.$$

This results in:

$$\text{Torque increase: } \tau \times 1.5, \quad \text{Speed reduction: } \times \frac{2}{3}.$$

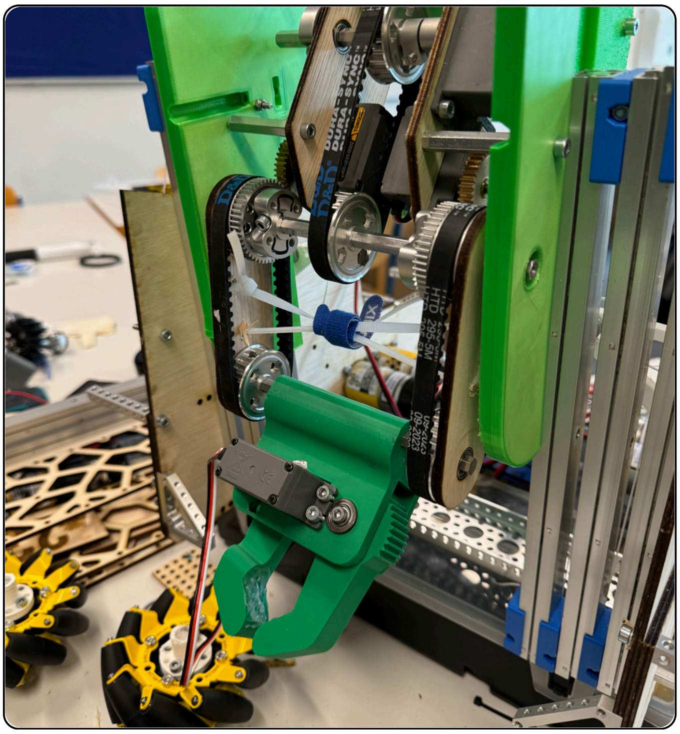
The maximum torque becomes:

$$\tau = 18.7 \times 1.5 = 28.05\,\text{Nm},$$

and the maximum speed is reduced to:

$$435\,\text{rpm} \times \frac{2}{3} = 290\,\text{rpm}.$$

Thus, the slides move slower but gain sufficient torque and strength for lifting.



Pros:

- Outtake functioned consistently. It was easy to passthrough and could reach the high basket too.

Cons:

- Difficult to install a transfer mechanism as there was too much empty space to fill inside the robot.
- Active intake was too inconsistent.
- Intake was too heavy for the front of the robot.

Think Design - Robot Iterations

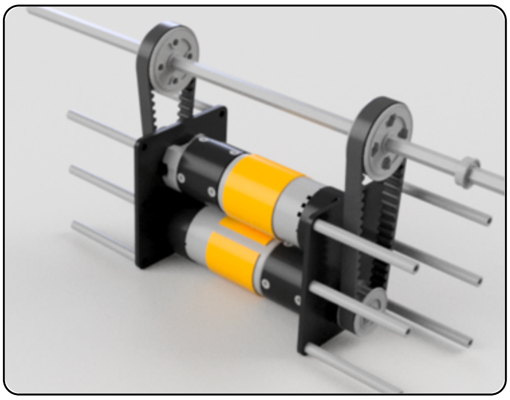
Iteration 4 - Iterations & Intake Overhaul

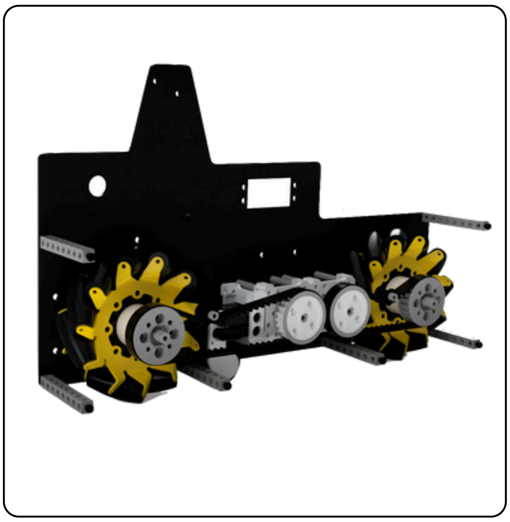
Reason: Addressed inconsistencies in the claws by redesigning both, keeping the drivetrain and linear slides the virtually the same.

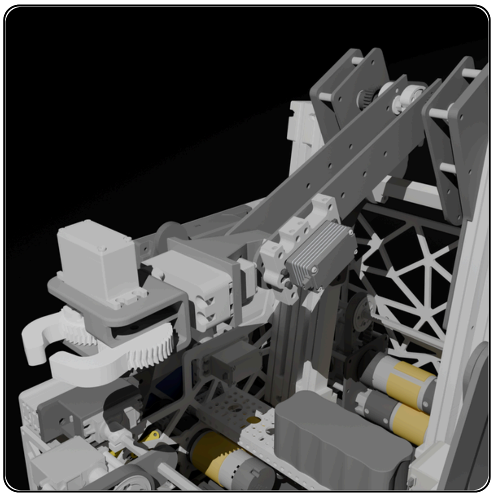
Key Changes:
- More compact drivetrain while retaining the belt system.
- Relocated linear slide motors to the back, improving string alignment and front space.
- Added a two-bar linkage for horizontal slides, removing loose string attachments.
- Switched to a differential claw for efficient claw-to-claw transfers.

Pros:
- Compact, simplistic design. (K.I.S.S. Principle)
- Scored a season-high 70 points without autonomous.

Cons:
- Vertical slide pulleys were occasionally unreliable.
- Differential claw blocked the vision camera during autonomous.







Iteration 5 & 6 - Outtake Redesign

Reasons: Time lost having to pass through the slides and rotate the robot when placing.

Key Changes: Iteration 5
- Passover claw instead of passthrough. Claw arm can now rotate over the slides instead of between them

Pros:
- Save space and reduce complexity of design
- Save time for placing specimen as bot wouldn't rotate.

Cons:
- Specimen would be placed upside down, increasing chances of an unsuccessful place.

Key Changes: Iteration 6
- Added a rotating wrist on outtake claw + taller aluminum plates.

Pros:
- Allowed for the rotation of the specimen to place from above.
- More strength in Aluminum and more stability for the linear slides

Design - Intake Assemblies

Horizontal Linear Slides

- Purpose: Used to move the intake into the submersible and increase the reach of the robot.
- Two servo motors are connected to a horizontal linear slide mechanism.
- Custom 3D-printed parts house the servos and connect them to the slides.
- Instead of string we used a linkage to power the slides as it would cut down on the inconsistencies we saw on the vertical linear slides.

Hang Mechanism Calculation

Given:

$m = \text{mass of robot} = 12.45\,\text{kg}, \quad G = 9.8\,\text{m/s}^2, \quad t = 0.8\,\text{seconds}.$

The change in height is:

$$\Delta h = 52\,\text{cm} - 27\,\text{cm} = 25\,\text{cm} = 0.25\,\text{m}.$$

The change in gravitational potential energy:

$$\Delta E_p = mg\Delta h = (12.45\,\text{kg})(9.8\,\text{m/s}^2)(0.25\,\text{m}) = 30.5\,\text{J}.$$

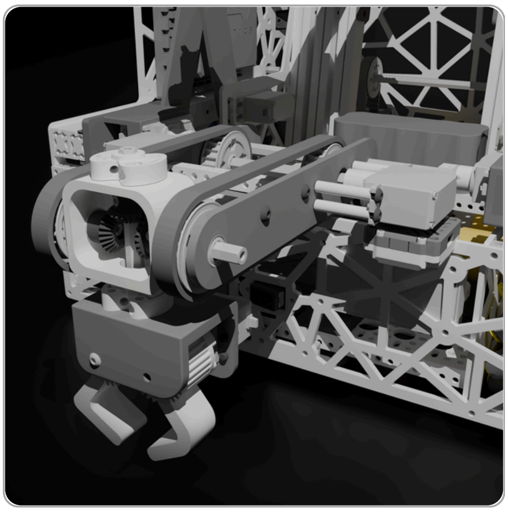
The power required is:

$$P = \frac{\Delta E_p}{2t} = \frac{30.5}{1.6} = 19.06\,\text{W}.$$

The current required is:

$$I = \frac{P}{E} = \frac{19.06\,\text{W}}{12\,\text{V}} = 1.6\,\text{A}.$$

Since $1.6\,\text{A} < 9.2\,\text{A}$ (stall current for motor), our motors can lift the robot without issue.



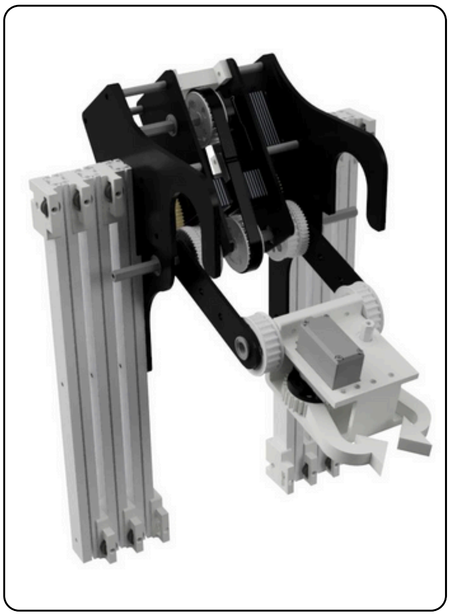
Belt-Driven and Differential Intake:

- The intake arm rotates around the axis of these two servos, enabling picking and transferring to the outtake claw.
- Two servos are connected to the side plates of the intake that power the differential gear.
- When both servos spin in the **same direction**: The second arm and claw rotate independently of the main intake arm around a horizontal axis passing through the gears.
- When servos spin in **opposite directions**: The gears spin a third gear, locking horizontal axis rotation and enabling the claw mechanism to rotate around a vertical axis.

Intake Claws:

- Powered by a goBILDA continuous rotational servo.
- Allows the claw to open and close.
- Iterative improvements focused on making the claw more compact and robust with stronger 3D print materials and design to withstand strain from competitive gameplay.

Design Innovate - Outtake Assembly



Iteration 1: Rotation and Passthrough

- Driven by an Axon Servo connected to a belt system.
- The belt drives an axle that runs through both sides of the vertical linear slides.
- Second belt system rotates the main front part of the claw independently from the main arm of the outtake.
- Rotation of the axle moves the large arm of the claw, allowing it to extent into the robot and up to place.

Iteration 2: Passover

- More simplistic design to save time when rotating the entire bot to place specimens.
- Two servos which drive a two gear system which rotates an axle.
- Mounted on the axle is the arm of the outtake which is longer as it isn't constrained by the size limits passing in between the linear slides.
- A third servo is mounted on the arm which powers a belt-driven system that rotates the claw independently of the arm, reducing the size of the claw by placing the pulley inside the claw mount and not outside.
- The arm is able to pass over the linear slides and place the specimen upside down.

Linear Velocity Calclulations

Given:

$$435\ \text{rpm motors} = 7.25\ \text{rps},$$

Circumference of wheel $= 104\,\text{mm} \times \pi = 326.7\,\text{mm} = 0.3267\,\text{m}$.

Linear velocity (v) is calculated as:

$$v = \text{circumference} \times \text{revolutions/sec} = 0.3267\,\text{m} \times 7.25\,\text{rps} = 2.37\,\text{m/s}.$$

(Assuming no friction.)

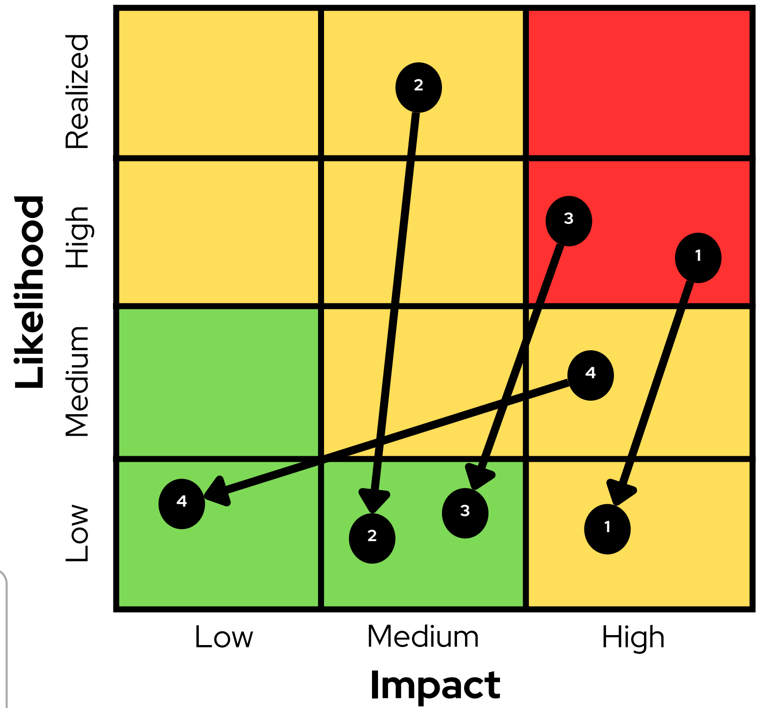
This allows for easy calculations of the possible cycle times for the robot.

Iteration 3: Rotating Wrist

- Reduced the size of the 3D-printed mount of the servo and claw hands for compactness. For this we used the same mount as the intake claw and adapted it slightly.
- Added a rotating wrist for the claw mount which could rotate the specimen to be placed from above
- This wrist removes the belt system and another servo which rotates the claw around the y-axis.

Motivate

Risk Analysis Graph
Mentor: Jim Heigle



1 Risk Statement

(1) Problem: Intake claw kept slipping and bot couldn't place specimen.
(2) Mitigation: Added a mix of silicon and hot glue to add more grip

2 Risk Statement

Problem: Linear slides were not moving in sync
Mitigation: Used a thinner string so it wouldn't wrap on itself, moving in sync again

3 Risk Statement

Problem: Vision camera would be blocked by intake claw, preventing autonomous pickup.
Mitigation: Changed intake design to be slightly smaller

4 Risk Statement

Problem: Outtake gears could fall off and demesh
Mitigation: A quick solution due to time was to add a second gear to the mechanism

Risk Management

Some ways that we mitigate risks are:

1. Many hours of testing and driver practice. We ensured that our drivers knew the robot well and ensuring that we could identify any problems with the robot before the qualifier.
2. We used Fusion 360 to CAD all parts that were put on the robot beforehand and check clearances and movement.

Optimal Adaptability

We designed our robot to **place** both **specimens** and **samples**, allowing us to stay flexible and adapt to any alliance. This versatility helped us create **effective strategies** that minimized field traffic, especially when working with partners using **similar approaches**. By reducing congestion, we improved coordination and overall alliance performance.

Cost-Benefit Analysis (Risk Management)

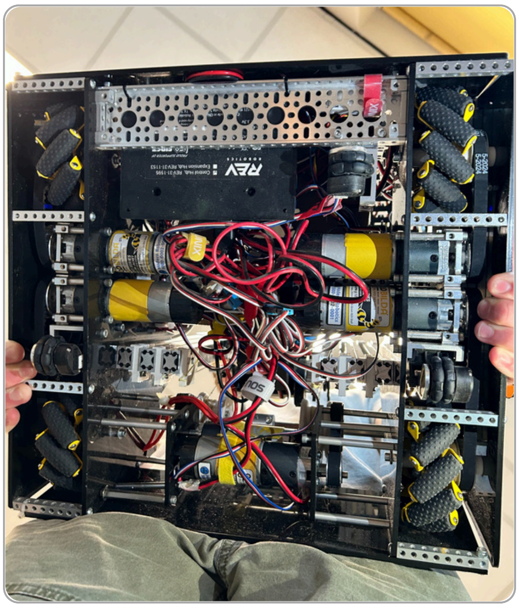
After the scrimmage on Nov. 23, 2024, the team planned for the 70 days leading up to qualifiers:

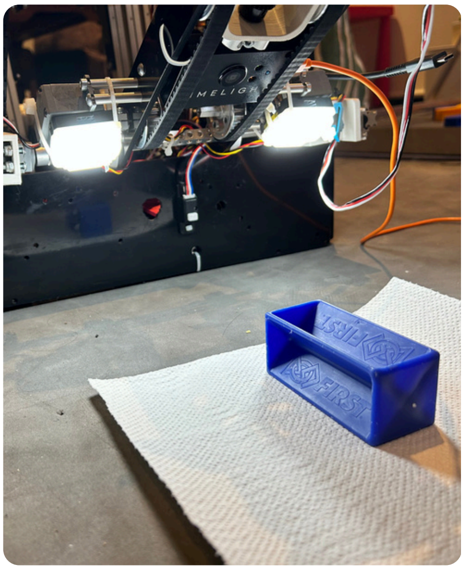
1. ***Prioritize driver practice above all else:*** Improving from the previous FTC season, which lacked driver practice and consistency, allowing for lower consistent scores to trump higher consistent ones
2. ***Prioritize a great auto:*** Allowing us to utilize a period that would get us double the points of TeleOp and increase our total.
3. ***Hold off on any major design changes:*** Protect the time needed for driver practice and auto programming.
4. ***Make smaller adjustments and iterations:*** This was to the intake and outtake claw mentioned in the design section

Control

Odometry Pods & Pedro Pathing

We use odometry pods along with a pinpoint IMU to track our robot's position on the field and subsequently feed the values into a customized iteration of PedroPathing, a **state-of-the-art, modern** pathing library. We were able to execute complex autonomous paths with **dynamic path adjustments**, allowing the robot to remain **reactive and thus reliable** during the autonomous period (even after contact with other bots). Additionally, we are able to create paths on the fly, allowing us to **quickly modify** our autonomous strategy if our alliance partner has overlapping autonomous paths.





April Tag Relocalization & Sample Detection

Using the Limelight 3A, we implemented an April Tag relocalization algorithm which resets the tracked position any time one is in view. This allows us to offset any position drift encountered over time and have an accurate position locking mechanism. We also deployed a sample detection algorithm equipped with color and angle detection to improve our sample pickup efficiency and aid in sample-centric autonomous.

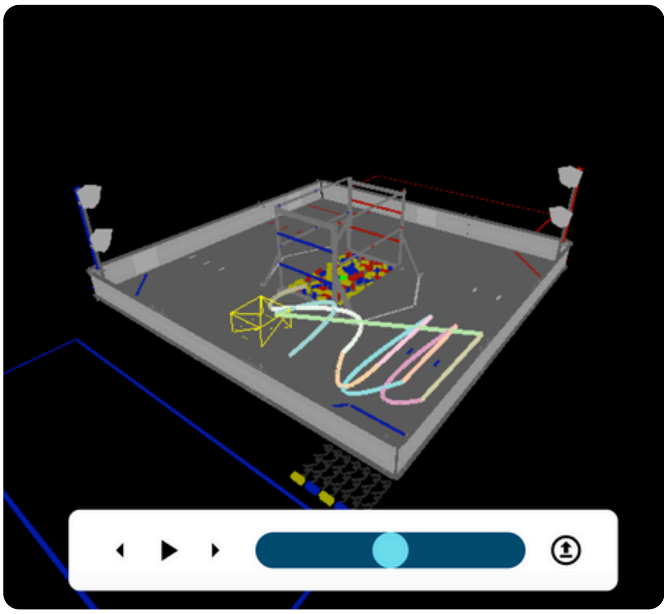
Control Innovate

JCoach - Live Cycle Tracking

In order to **optimize** our **cycle efficiency** during the TeleOp period, we constructed a **real time cycle tracking** tool for our drive coach in order to **support decisions** with **live comparisons** to historical match data in order to maximize points scored. While still a work in progress, we plan to release it for general use in the near future.

JSim - Simulate Past Matches

For better **match analysis**, we developed a **3D simulation software** for FTC called JSim. JSim **reconstructs full match trajectories** in a fully navigable environment. Equipped with **camera controls** and a **dynamic playback system**, it acts as an intuitive and reliable way of **post-match analysis,** allowing teams to quickly understand how to improve their points scored and their strategies. Through this, we've been able to optimize our paths.

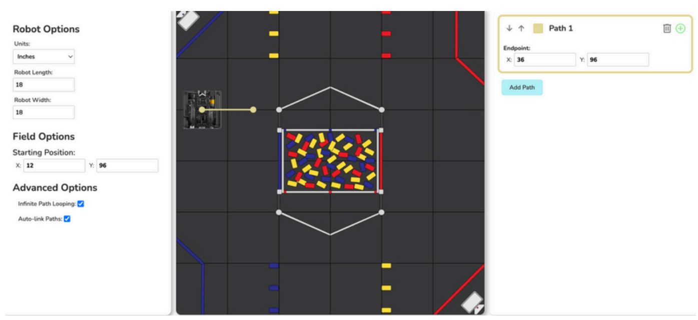


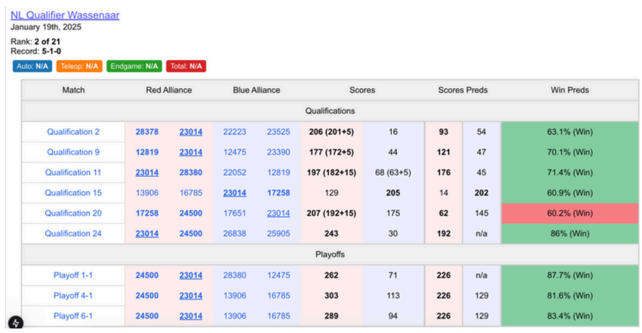
JPather - Redefining Autonomous Pathing

One of our largest projects this season was **creating an autonomous path visualizer from scratch** that further enabled the modification of paths on the fly. The website also enables the **sharing of paths between teams**, thereby promoting advanced pathing within the FTC community. The visual overlay on the game field and the **intuitive path creation** tools make JPather an **invaluable asset** for both rookie and veteran teams aiming to optimize their autonomous routines, with **over 100 teams** having used the site.

JScout - Deep Scouting Analysis

As part of our scouting, we made a platform based on Statbotics that allowed us to **rank opponents using an ELO system, predict how many points an alliance will score,** and ultimately **predict win chances for matches.** This became a key tool in strategy, allowing us to **create scouting reports** of every team, enabling us to **make informed choices for alliance selection.** The algorithm boasts a **>70% accuracy rate** for the Benelux region, with a **~90% accuracy rate for our team**.





NL Qualifier Wassenaar
January 19th, 2025
Rank: **2 of 21**
Record: **5-1-0**
Auto: N/A | Teleop: N/A | Endgame: N/A | Total: N/A

Match	Red Alliance		Blue Alliance		Scores		Scores Preds		Win Preds
Qualifications									
Qualification 2	28378	23014	22223	23525	206 (201+5)	16	93	54	63.1% (Win)
Qualification 9	12819	23014	12475	23390	177 (172+5)	44	121	47	70.1% (Win)
Qualification 11	23014	28380	22052	12819	197 (182+15)	68 (63+5)	176	45	71.4% (Win)
Qualification 15	13906	16785	23014	17258	129	205	14	202	60.9% (Win)
Qualification 20	17258	24500	17651	23014	207 (192+15)	175	62	145	60.2% (Win)
Qualification 24	23014	24500	26838	25905	243	30	192	n/a	86% (Win)
Playoffs									
Playoff 1-1	24500	23014	28380	12475	262	71	226	n/a	87.7% (Win)
Playoff 4-1	24500	23014	13906	16785	303	113	226	129	81.6% (Win)
Playoff 6-1	24500	23014	13906	16785	289	94	226	129	83.4% (Win)

Check these out at www.team23014.org/software!