FAMU-FSU College of Engineering

Team 507: Southeast Con
DR 6

Kelsey Gross, Ian Lemler, Luiz Santos, Eric Strawn

03/20/2025

Sponsors and Advisors

Dr. Oscar Chuy

Dr. Johnathan Clark

Dr. Bruce Harvey

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Meet the Team

Kelsey Gross

Team Captain
Drive Train Engineer

Ian Lemler

Collection Engineer

Luiz Santos

Joint Point of Contact
Beacon-Bin Engineer

Eric Strawn

Structural Engineer

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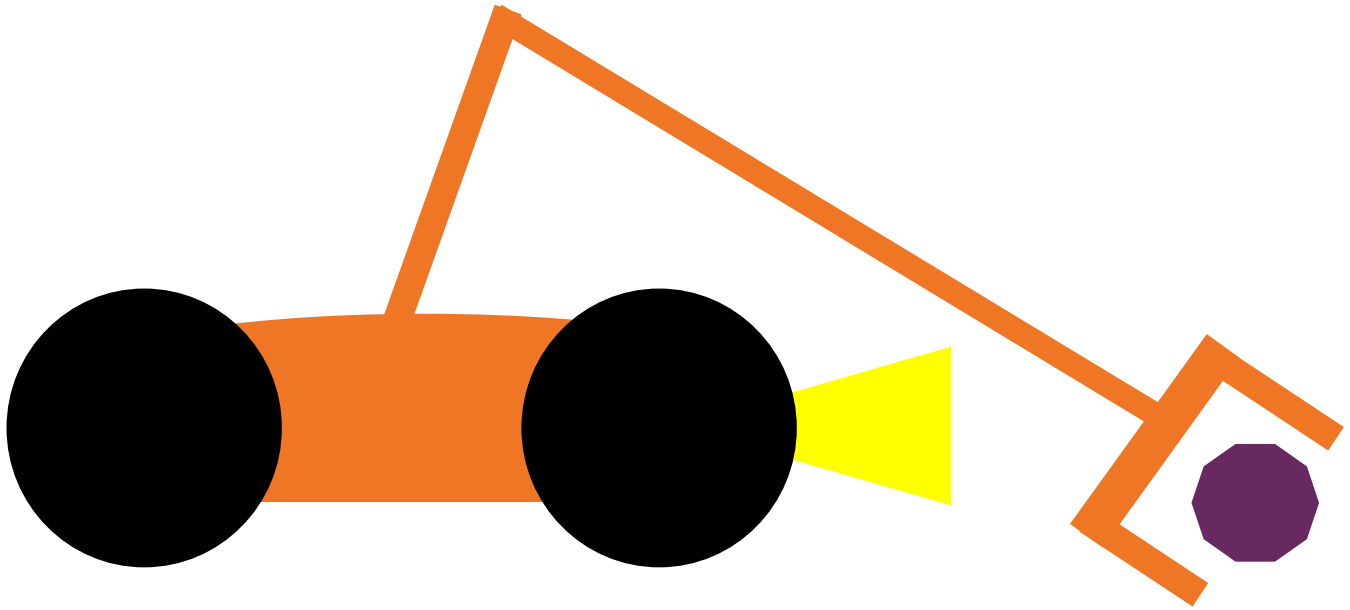
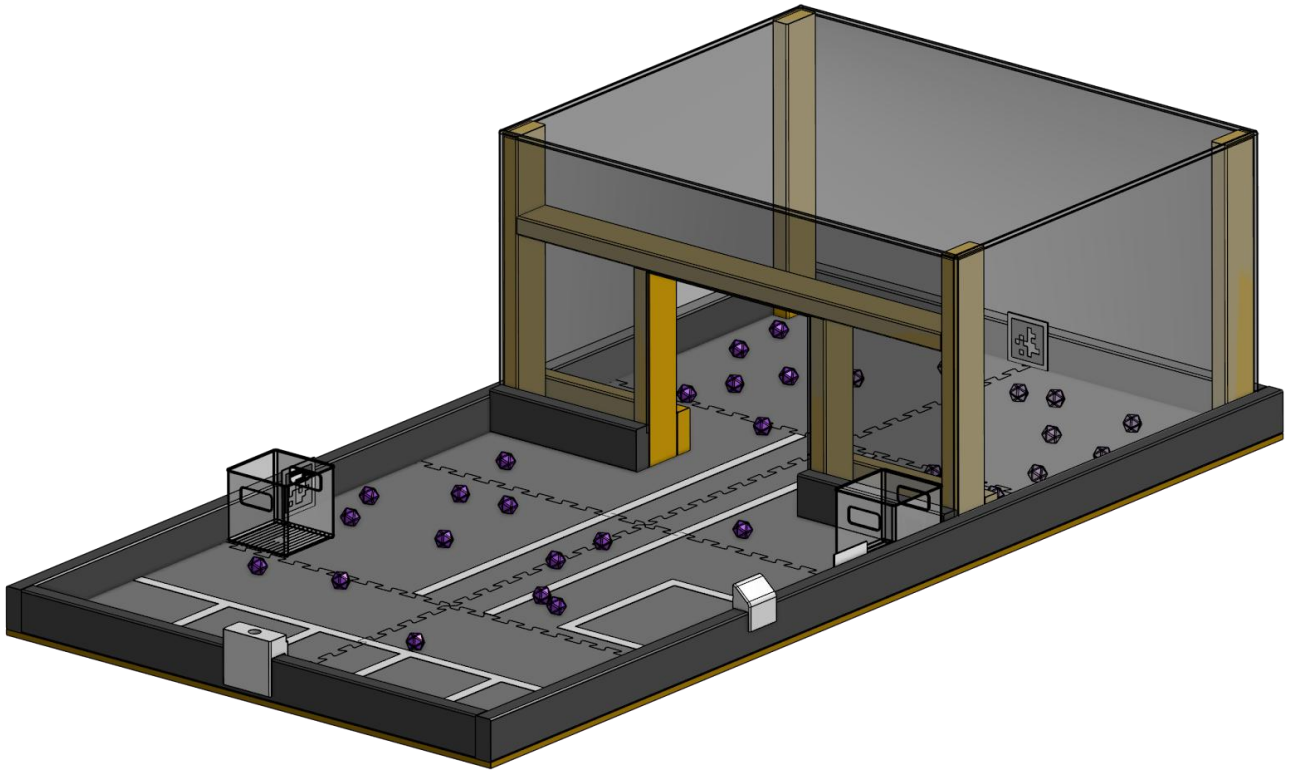
Objective

- The objective of this project is to design and develop a robot that will complete tasks and score points at the IEEE Southeast Con hardware competition.

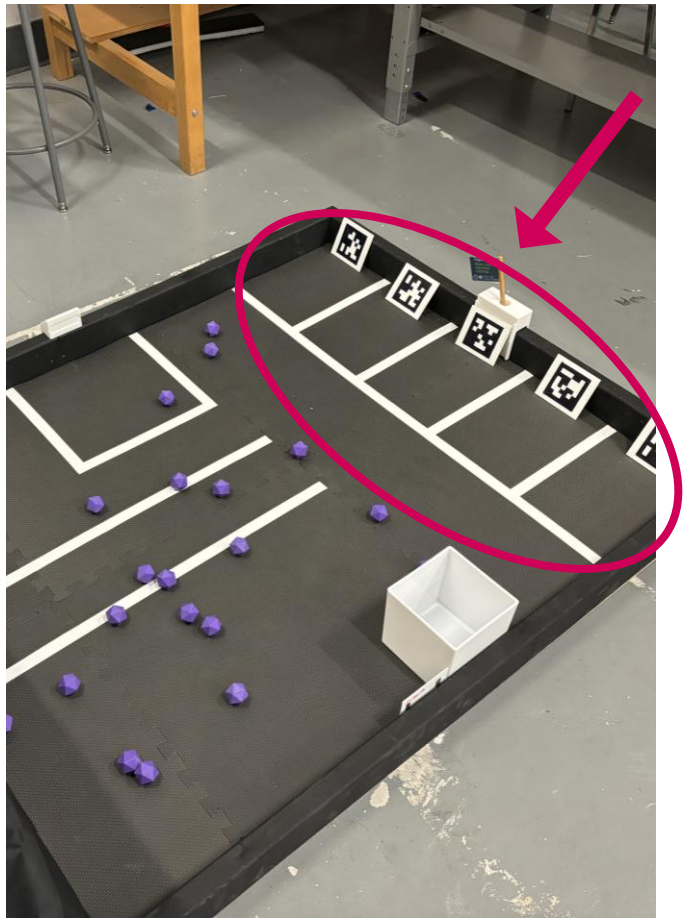


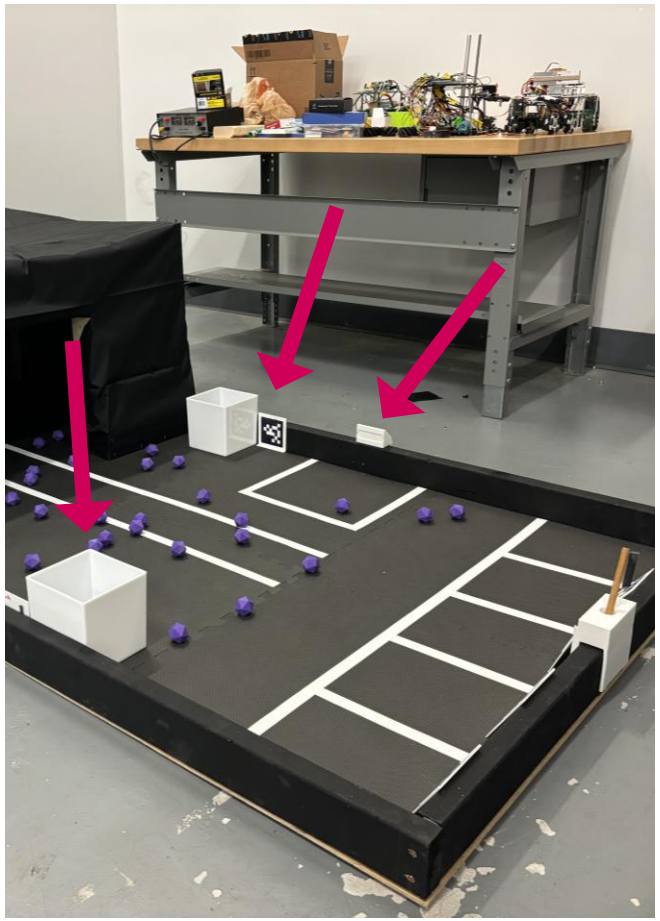
Project Description

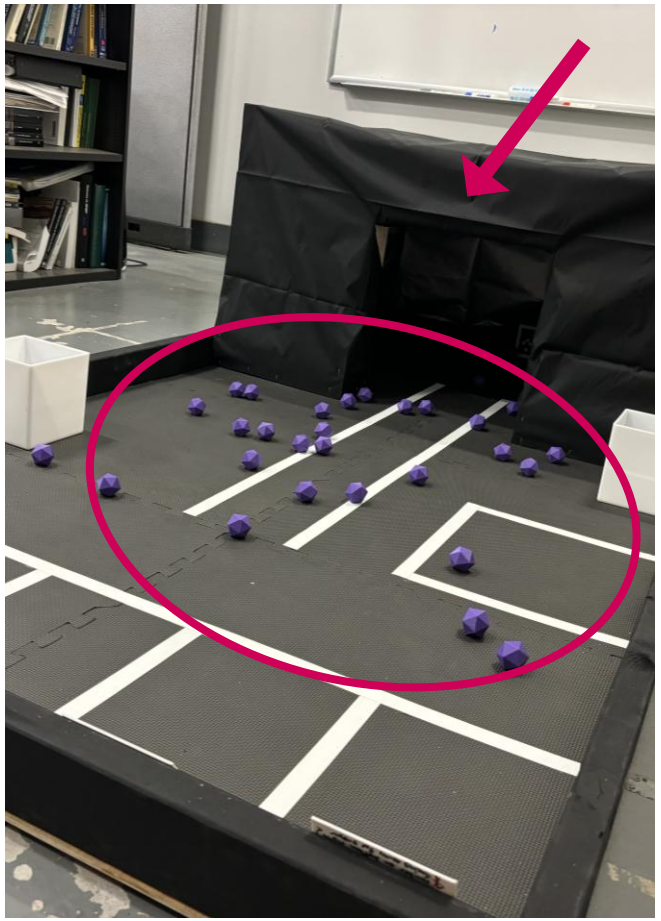
- Regional Competition for the Southeast States
- Design, build, test, and program a fully autonomous robot
- Work with ECE departments team
- 3 Minutes to earn as many points as possible
- Earn points by completing various tasks



The Game Field

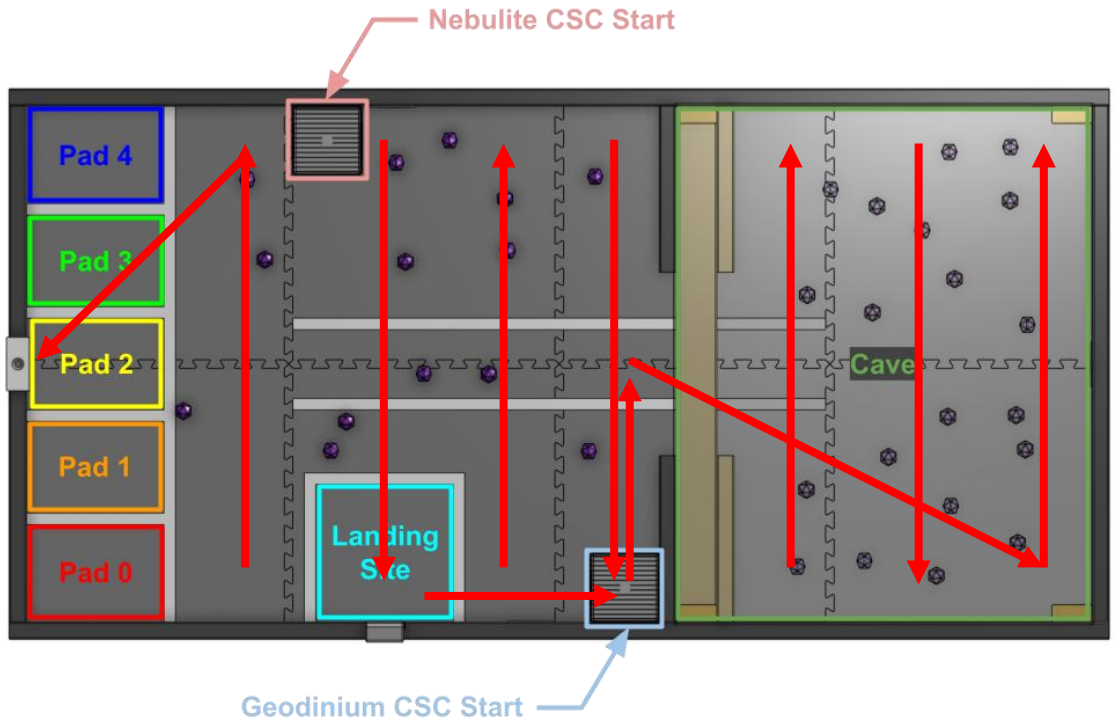






Point Optimization

Ideal Plan	Points
Out of the Landing Site	5
Out of the Landing Site within 3 Seconds	5
In the Cave (First Time)	15
Cosmic Shipping Container in Telemetry Rendezvous Pad	30
Geodinium in the Geodinium Cosmic Shipping Container	
Team Beacon has at least some portion in the Beacon Mast	40
In the Cave Points Gained	52
Out of the Cave Points Gained	88
Total:	235



Kelsey Gross

Drive Train Subsystem

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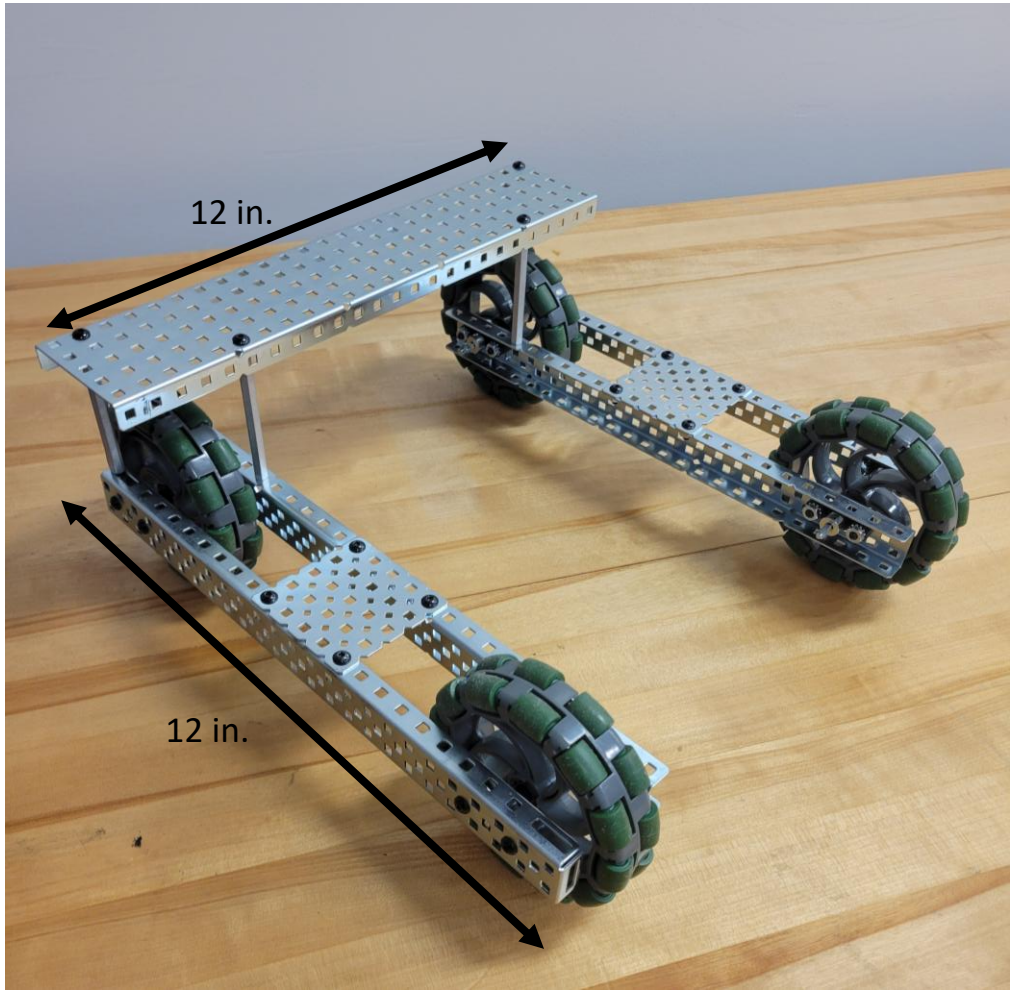
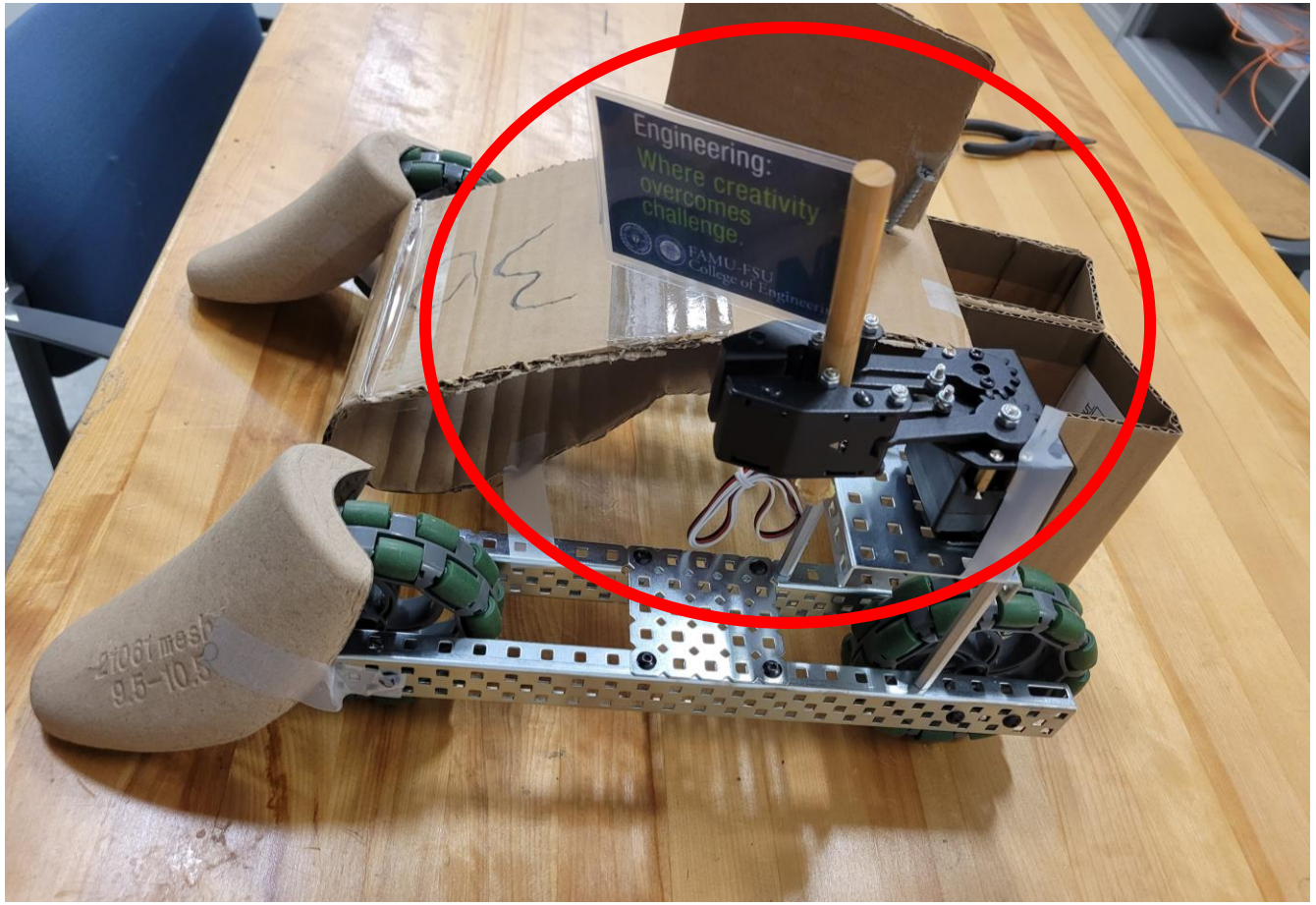
Initial Drive Train

- Proof of drive train concept
- Give a visual representation of start size constraint in the X and Y axis
- All omnidirectional wheels



Prototype 1


Engineering:
Where creativity
overcomes
challenge.
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Prototype 1

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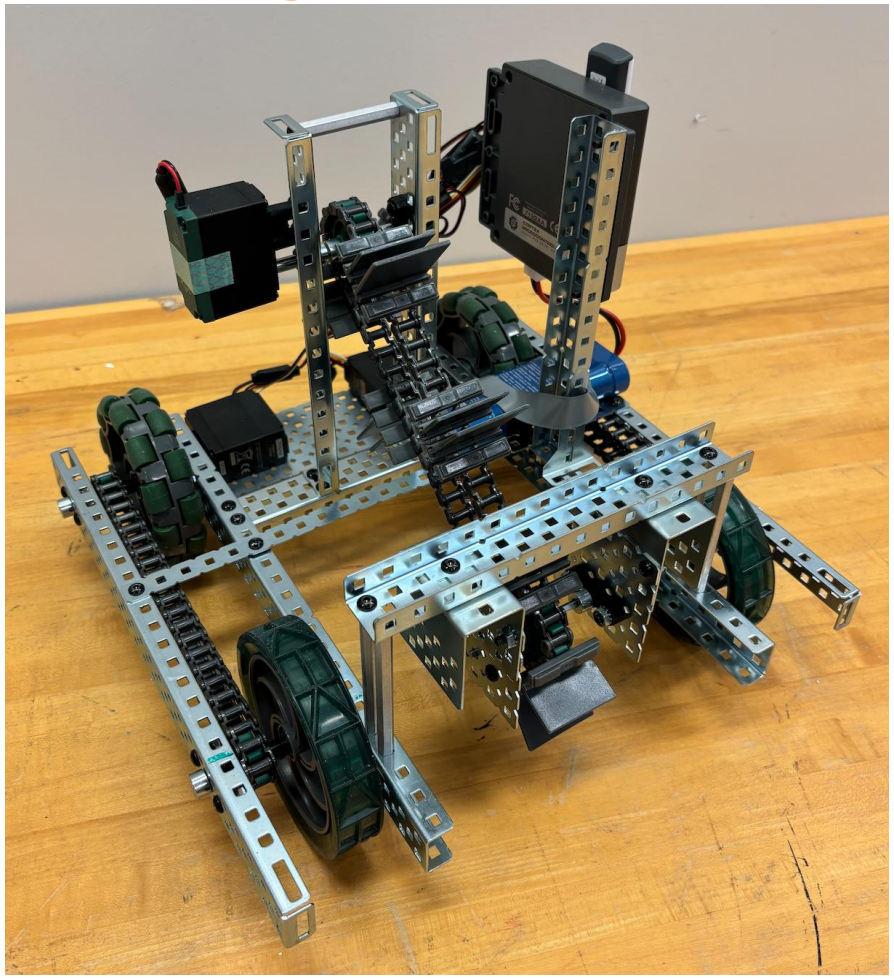
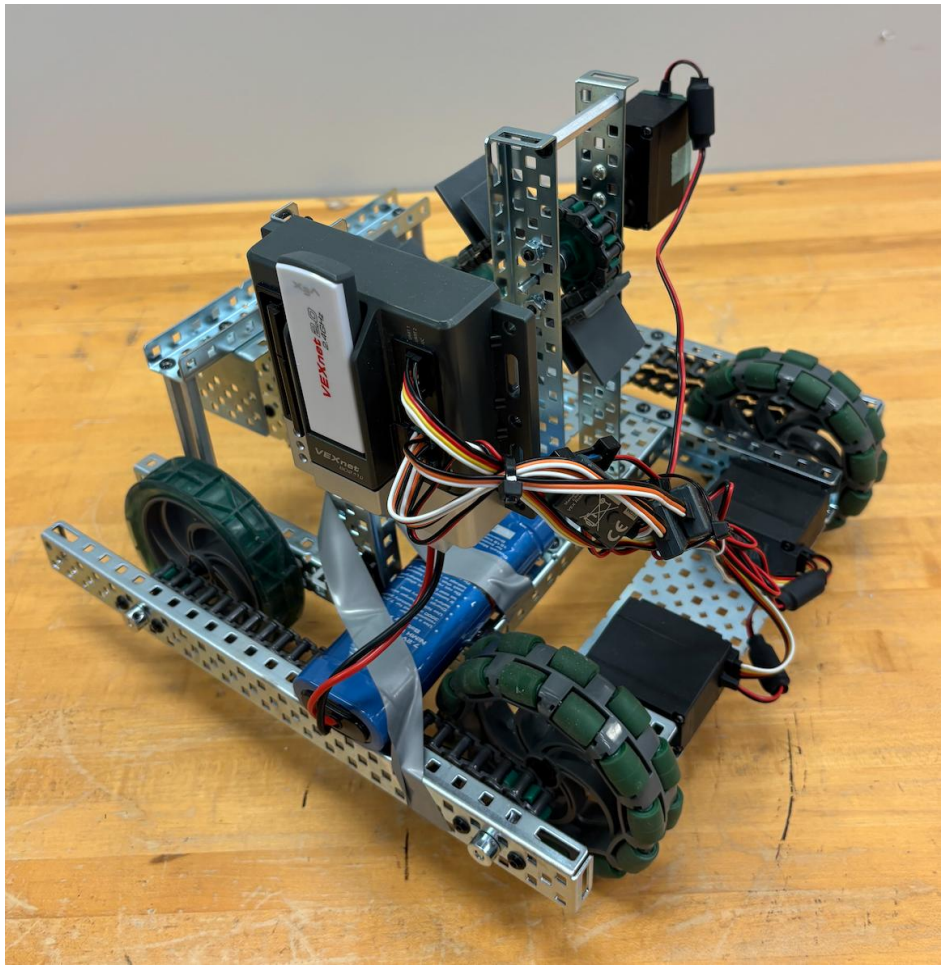
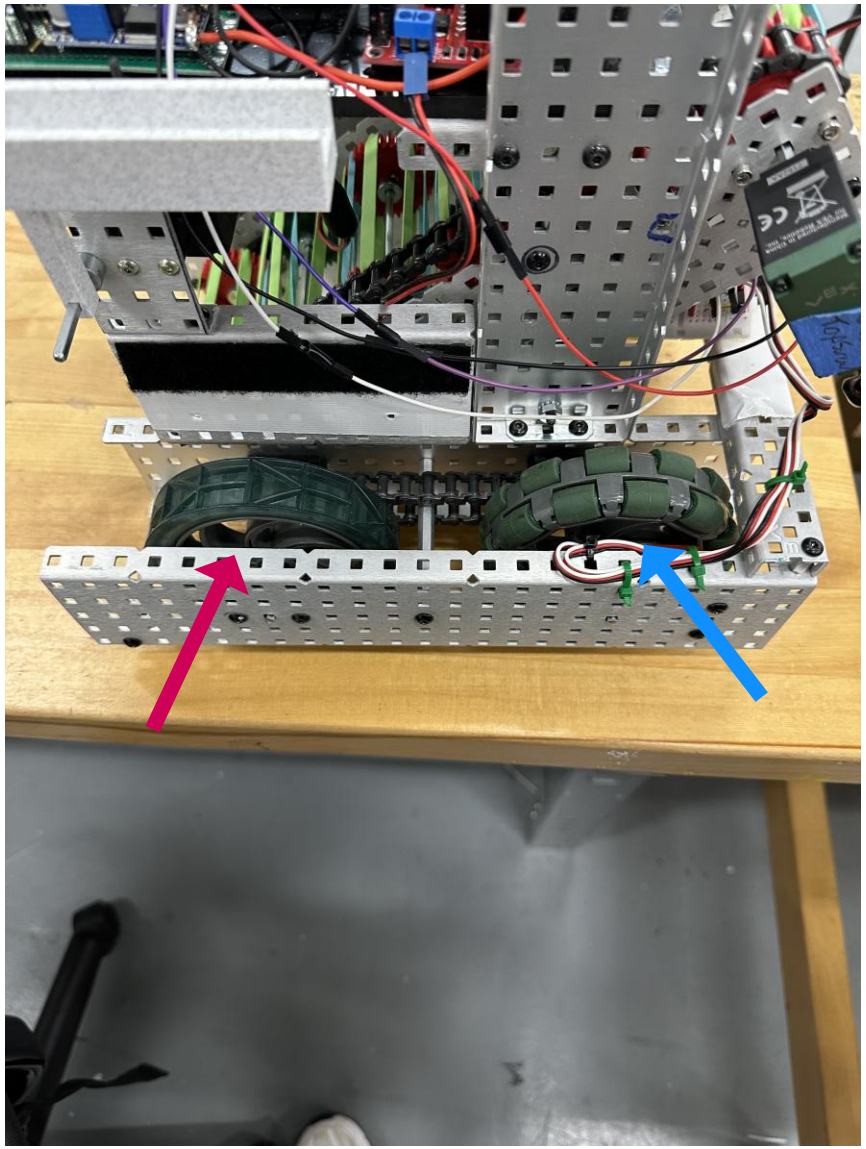
Prototype 2



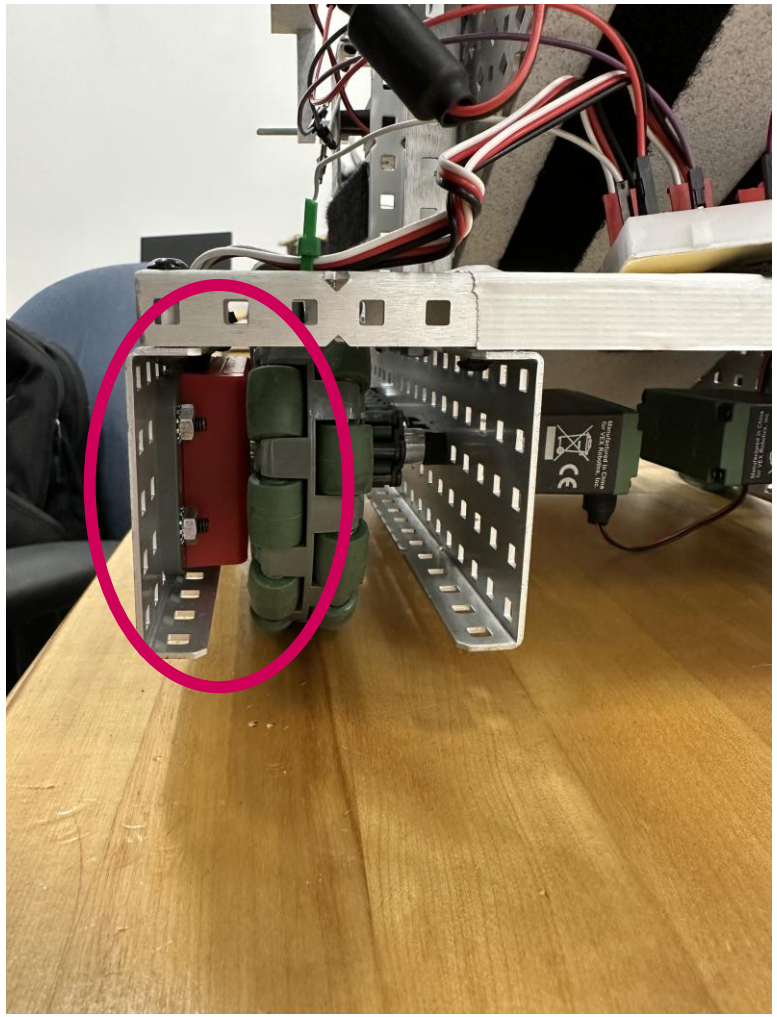


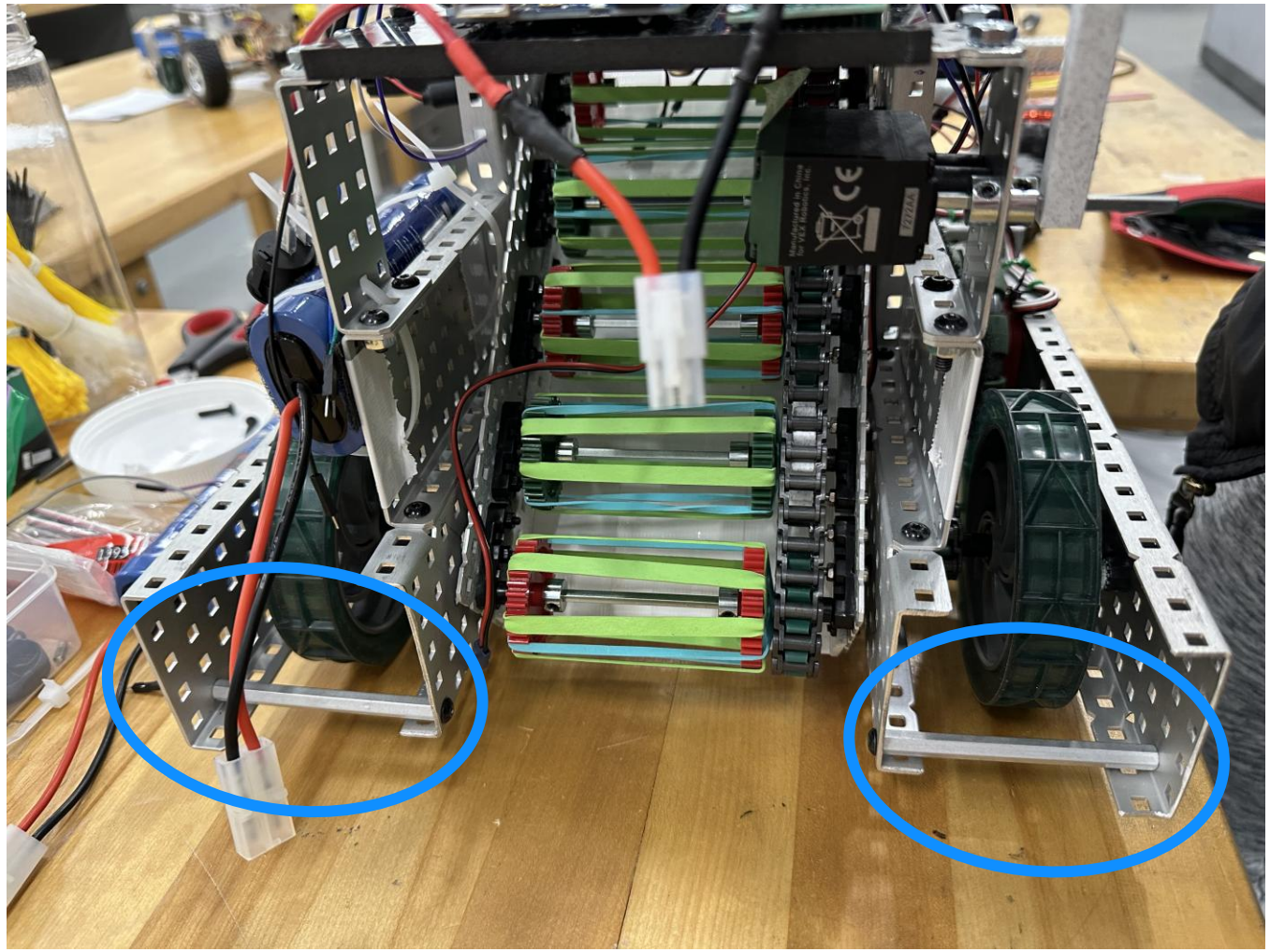
Final Drive Train

- Omnidirectional wheels in the back rubber wheels in the front
  - Magenta: Rubber
  - Light Blue: Omni-Wheel



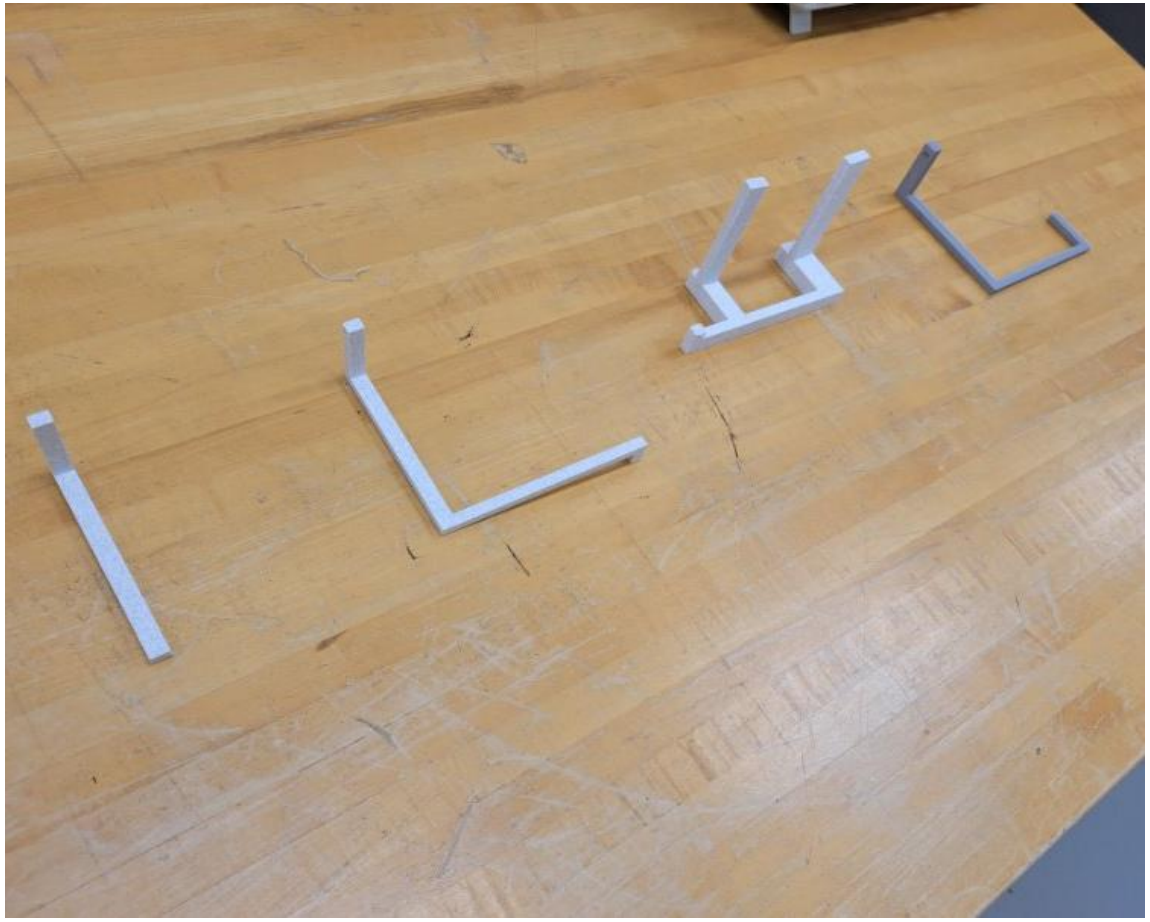
Design Features

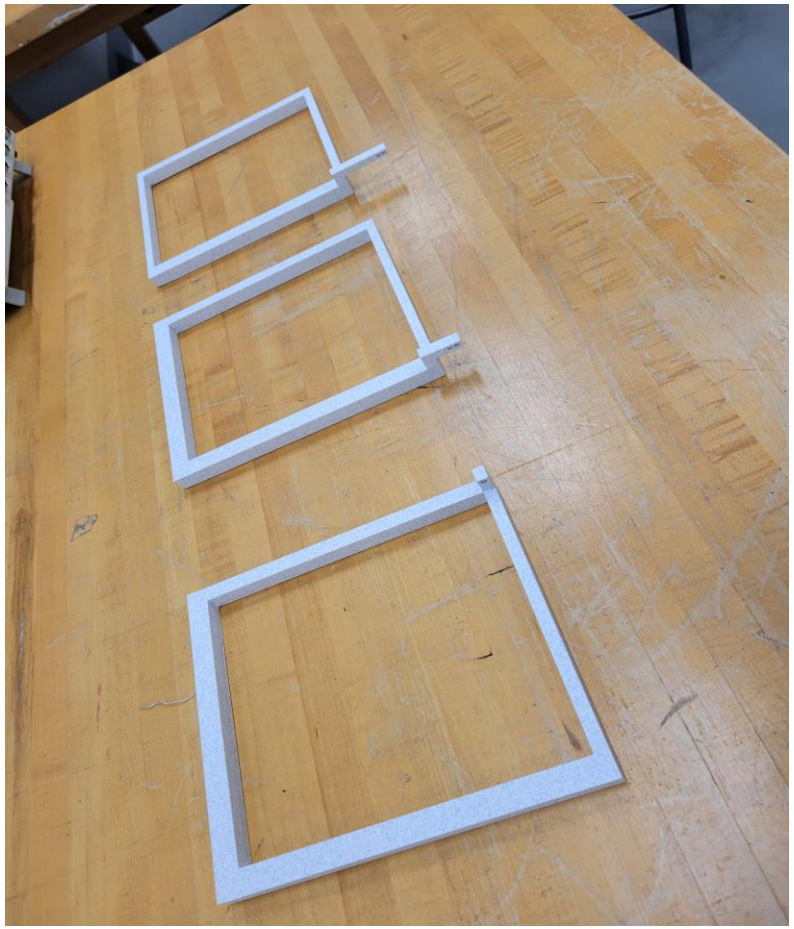




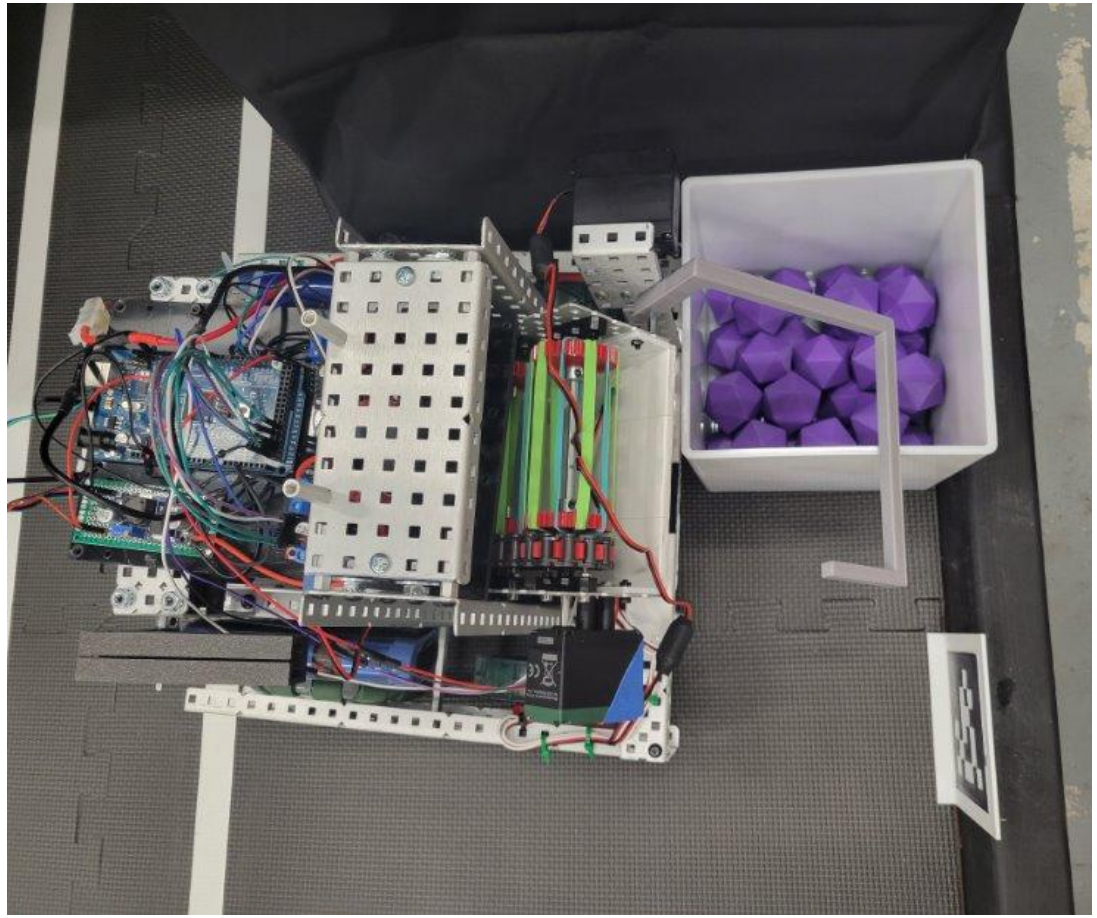
Bin and Beacon Subsystem

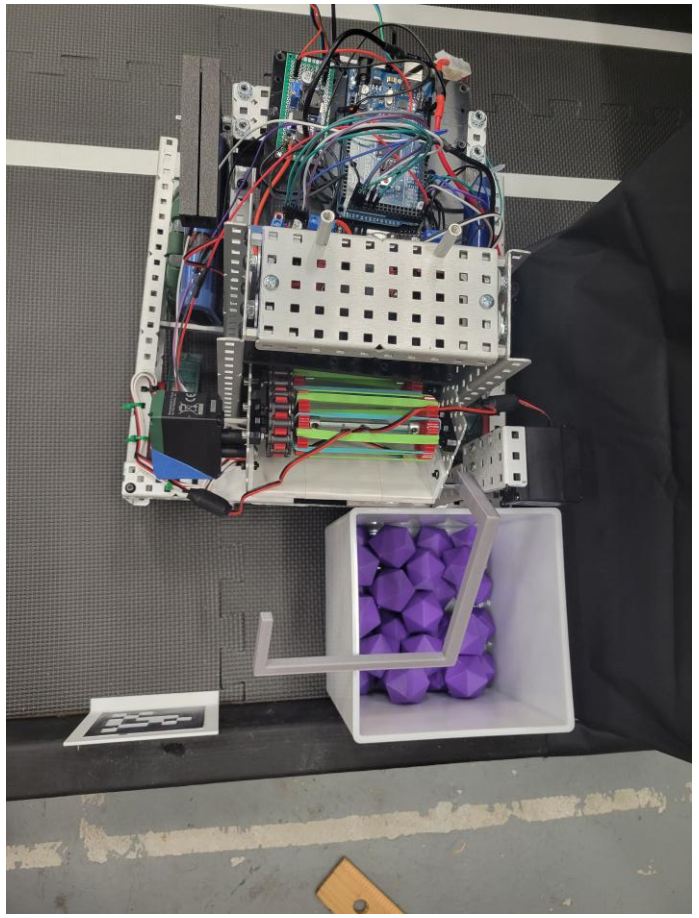
Prototype Progression





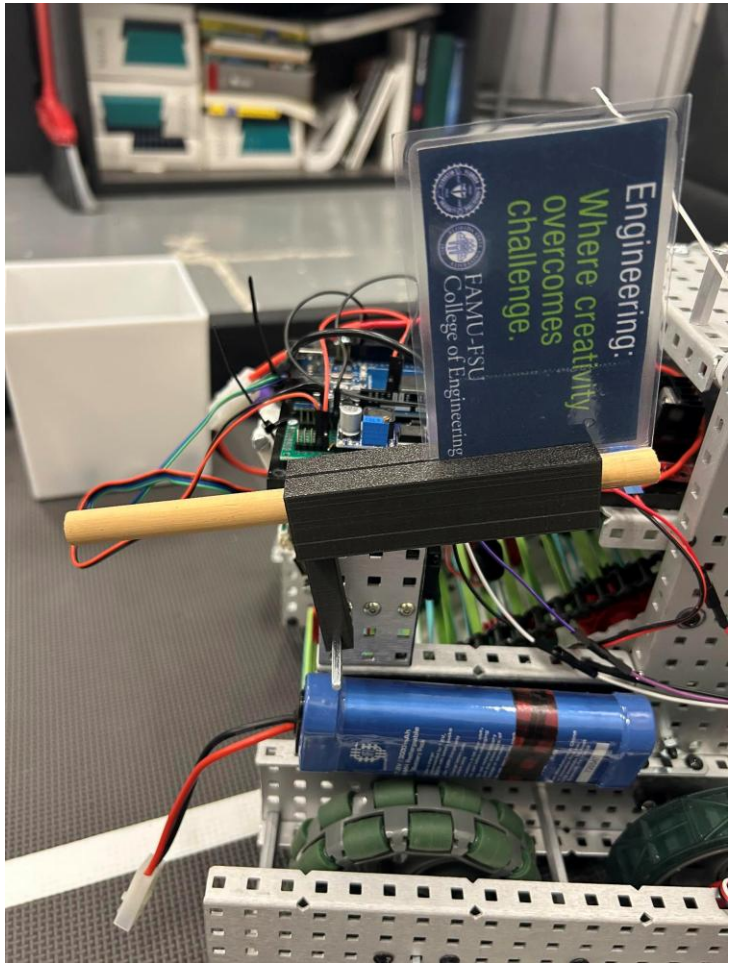
Problems

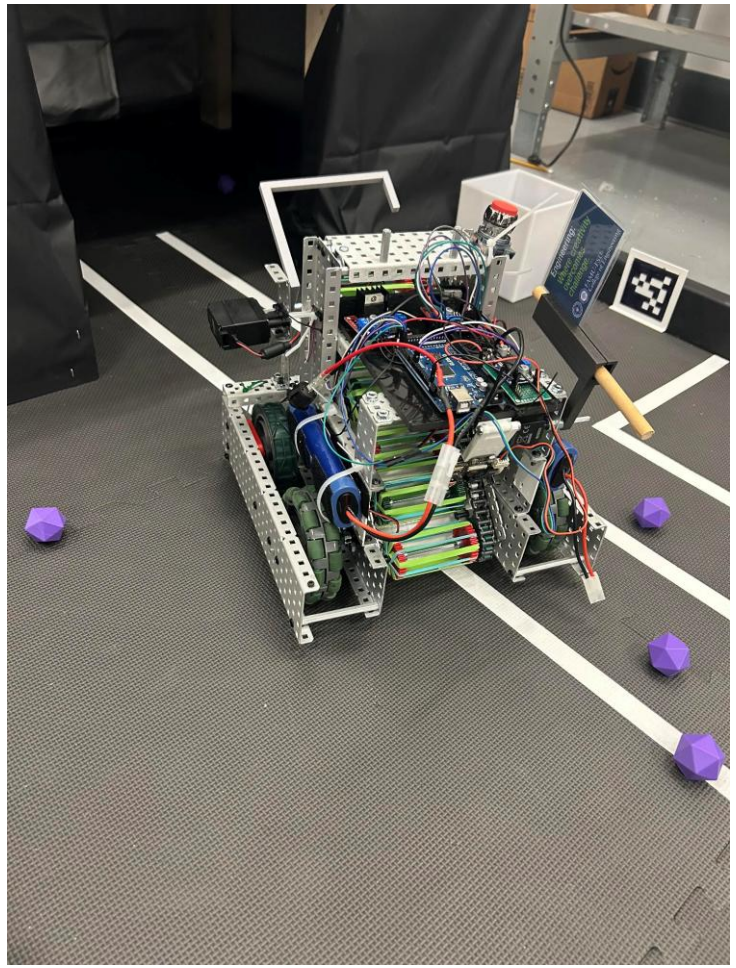




Final Concept

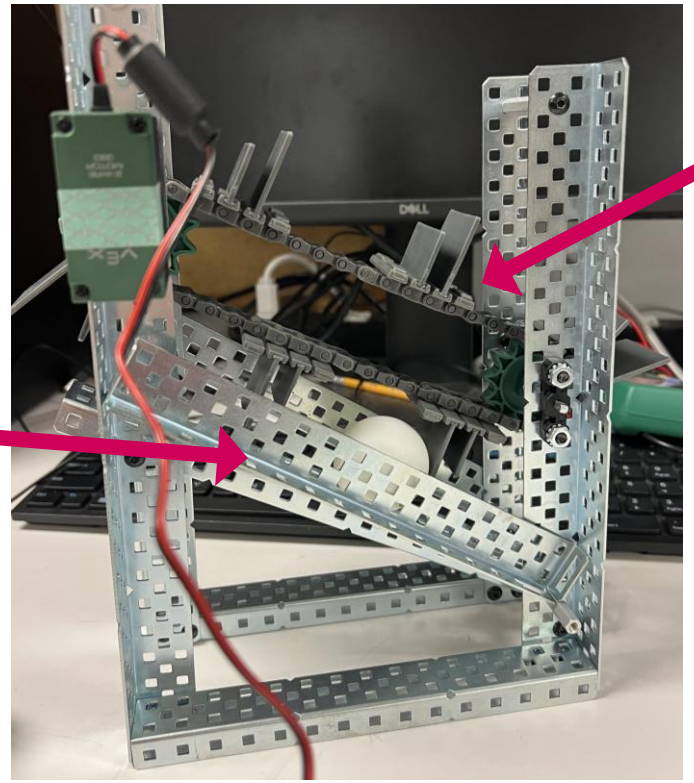
Bin Arm Prototype



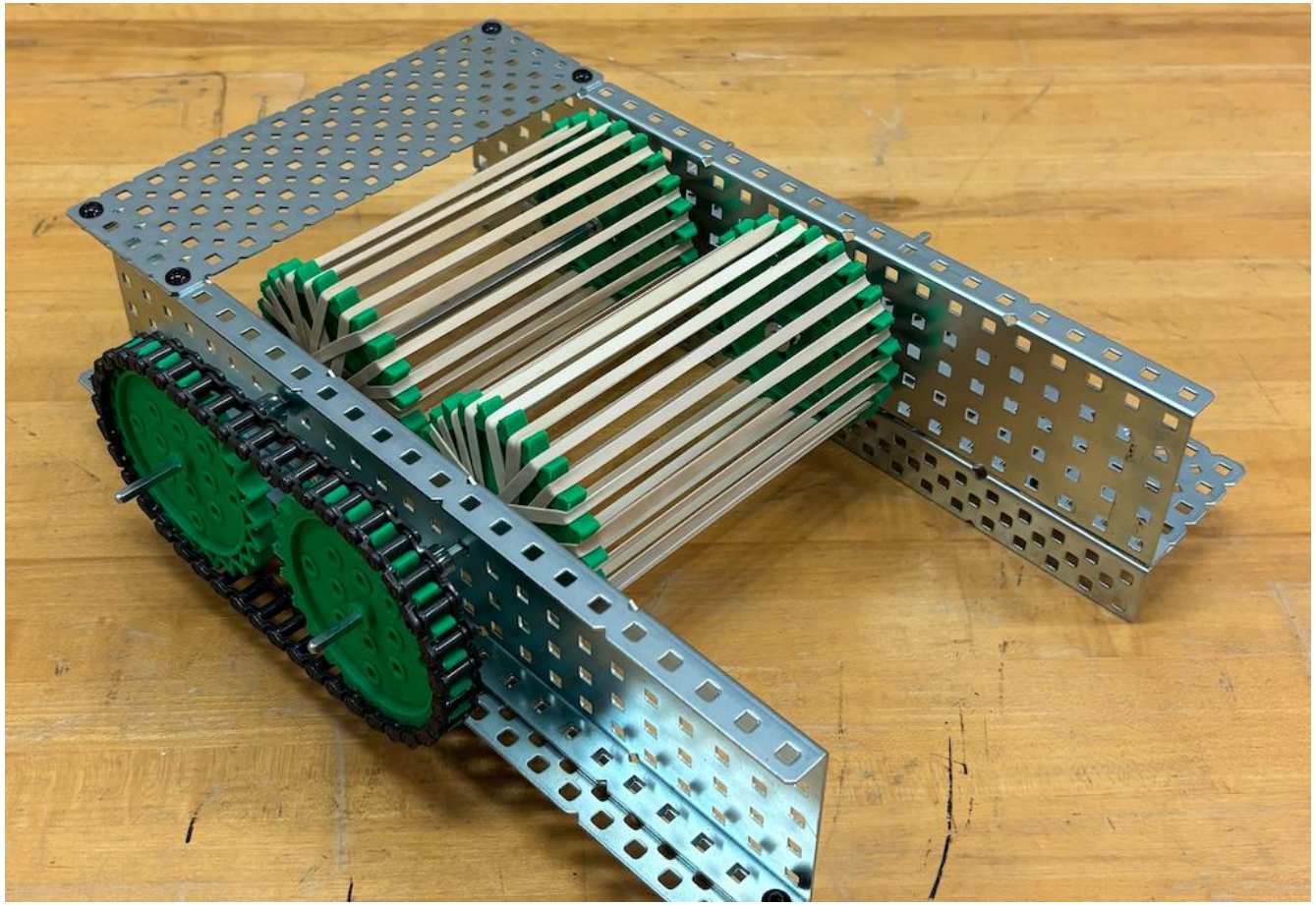


Intake Subsystem

Initial Concept for Intake

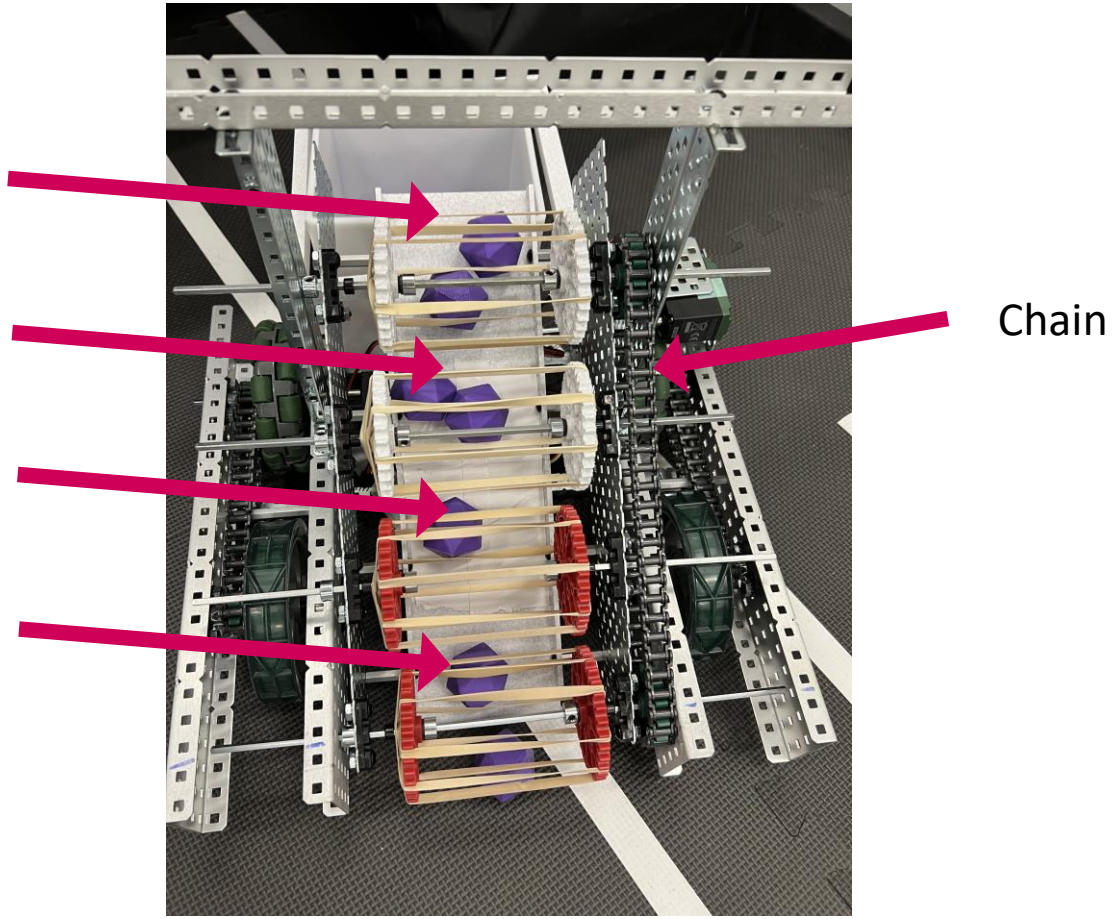


Proof of Concept for Band Rollers



Rubber Band Intake V1

Dead Spots



Chain

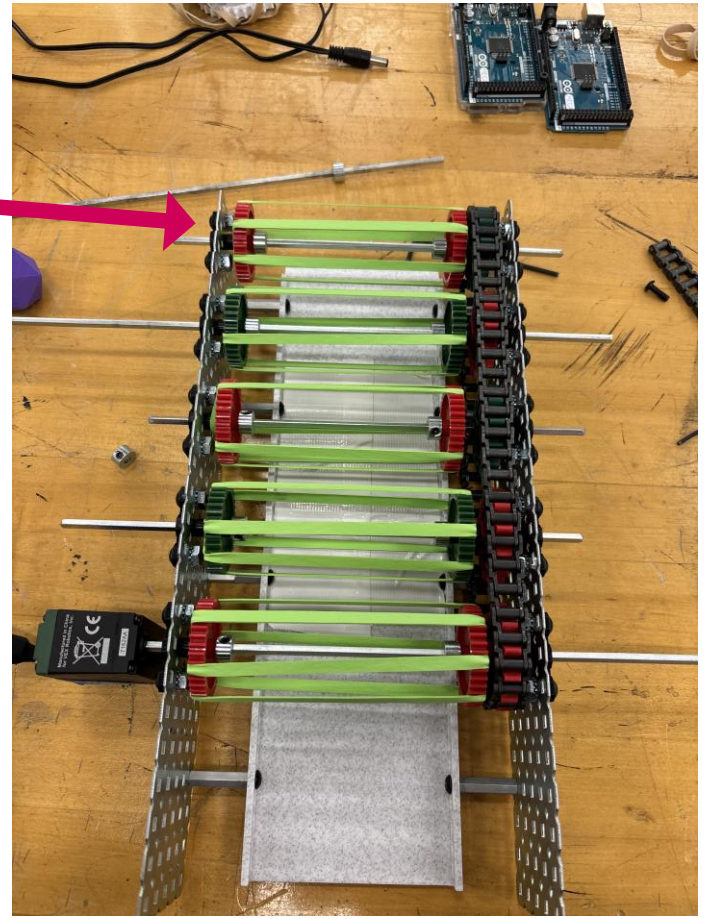
Rubber Band Intake V2

Smaller Rollers

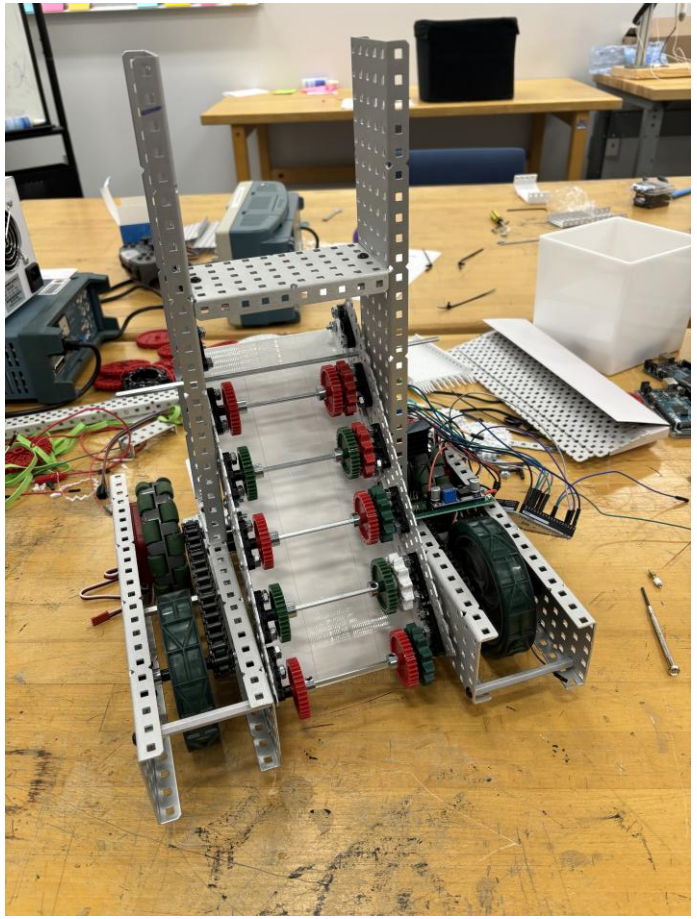
Large roller on front for increased reach

Rubber Band Intake V3

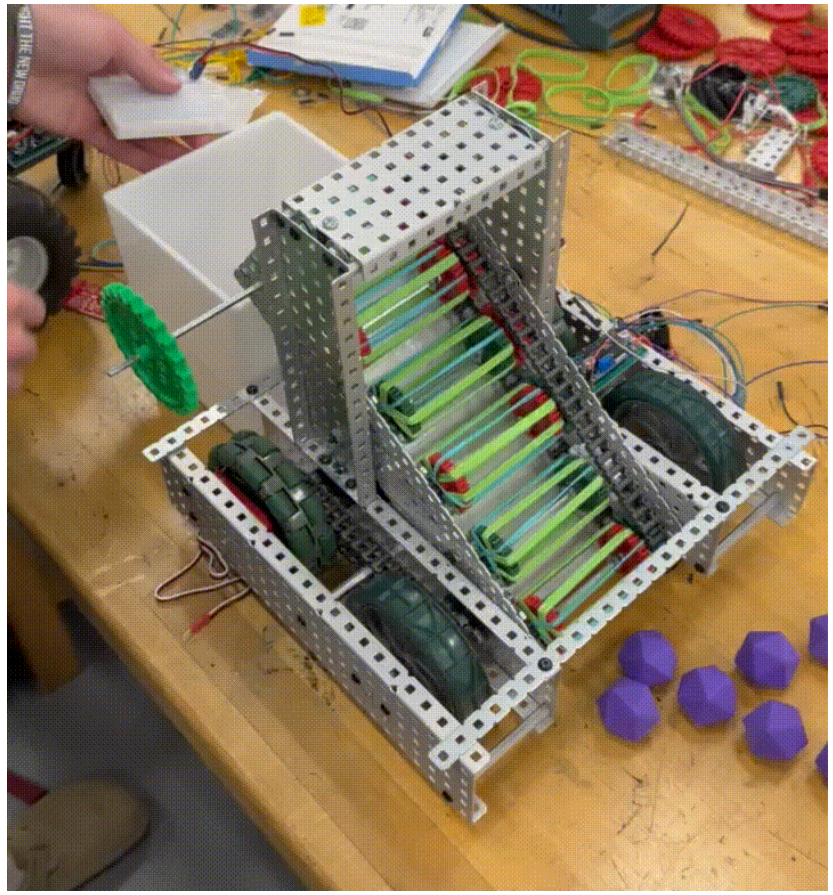
Moved to all smaller rollers



Integration With Robot Begins

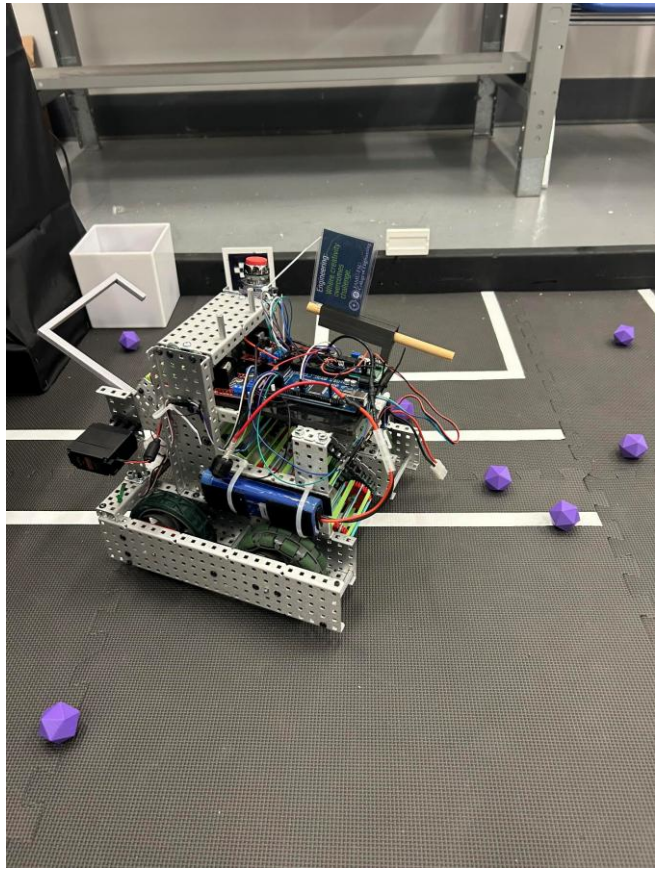


Intake Validation / Testing

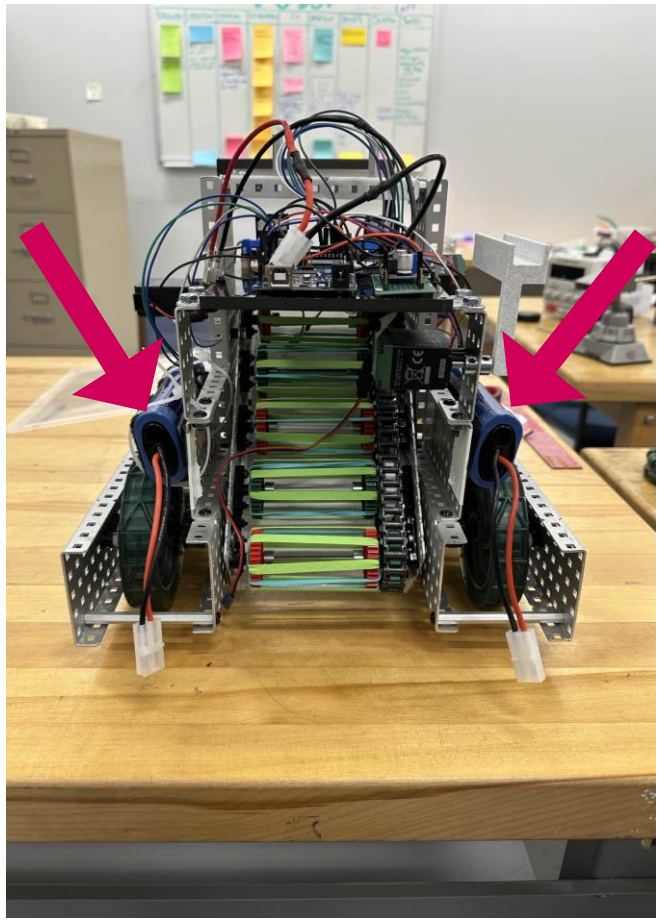


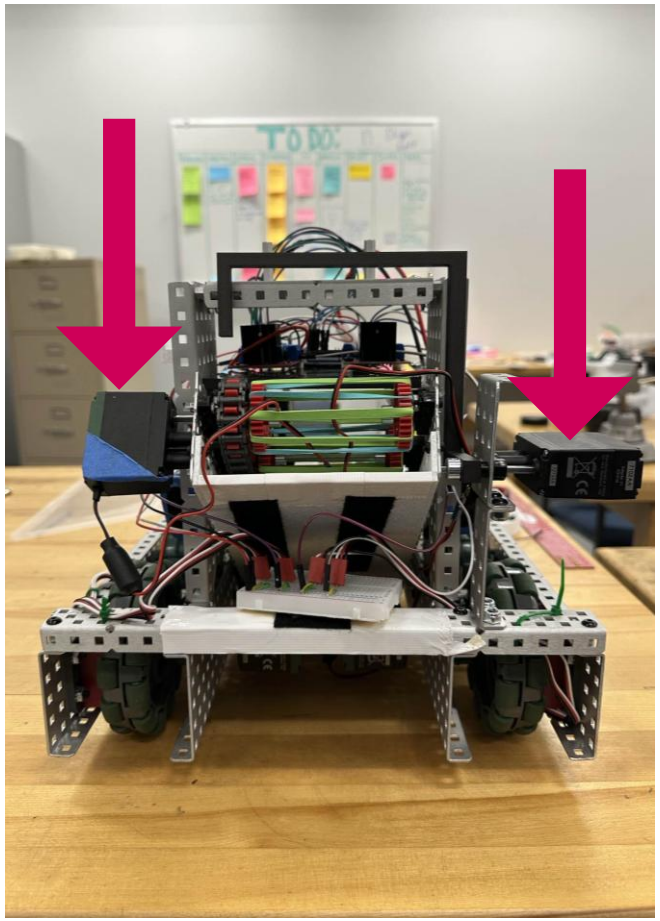
Structure Subsystem

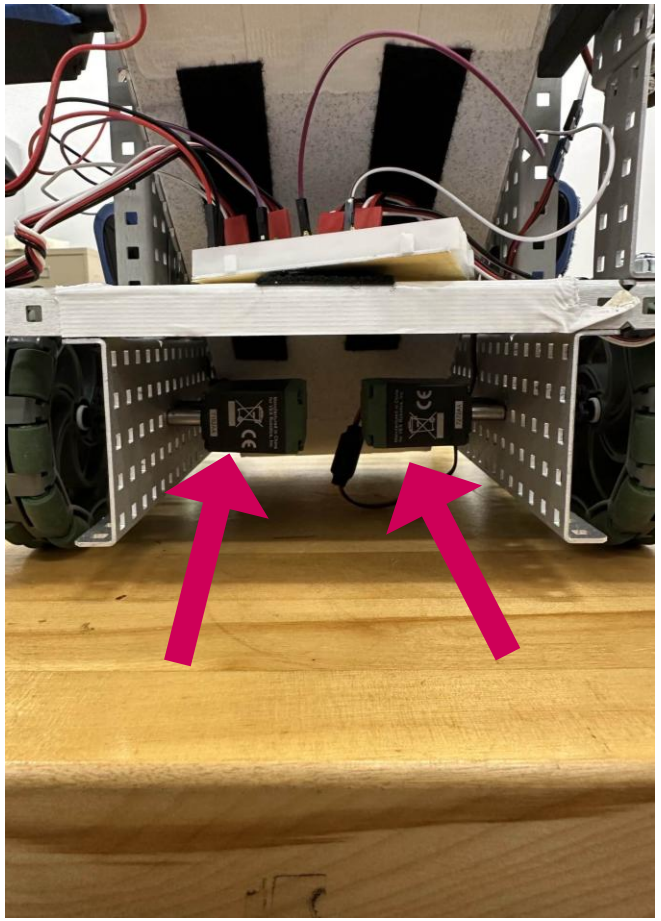
Balancing



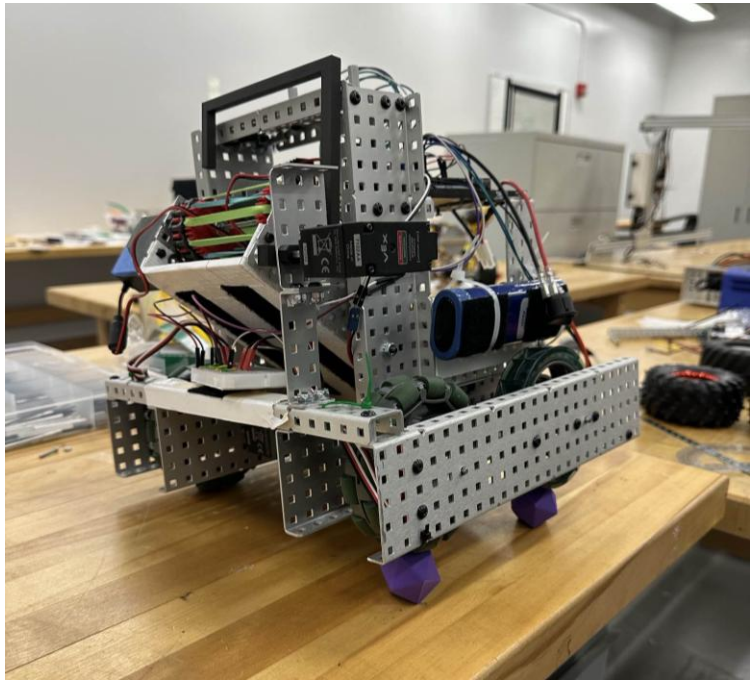
Balancing



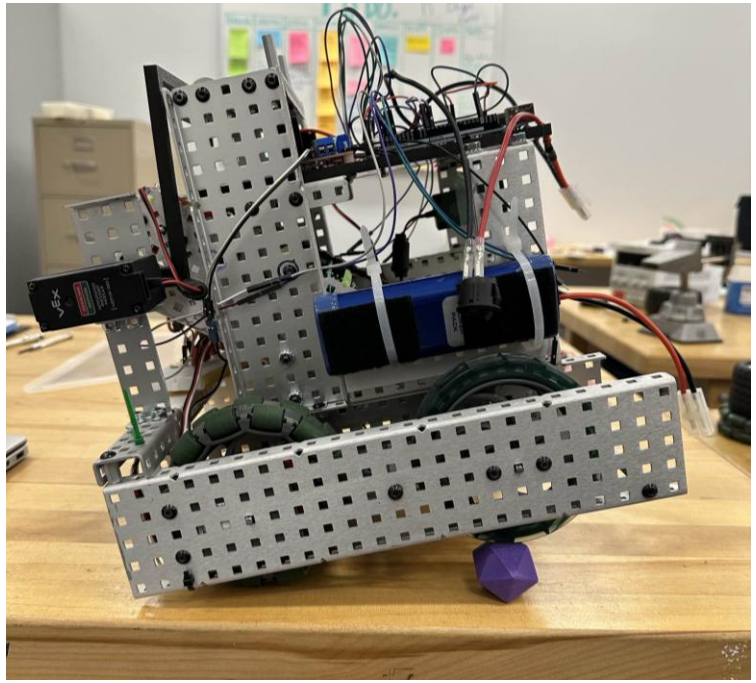




Balancing



Maximum tilt angle (side to side): 10 degrees

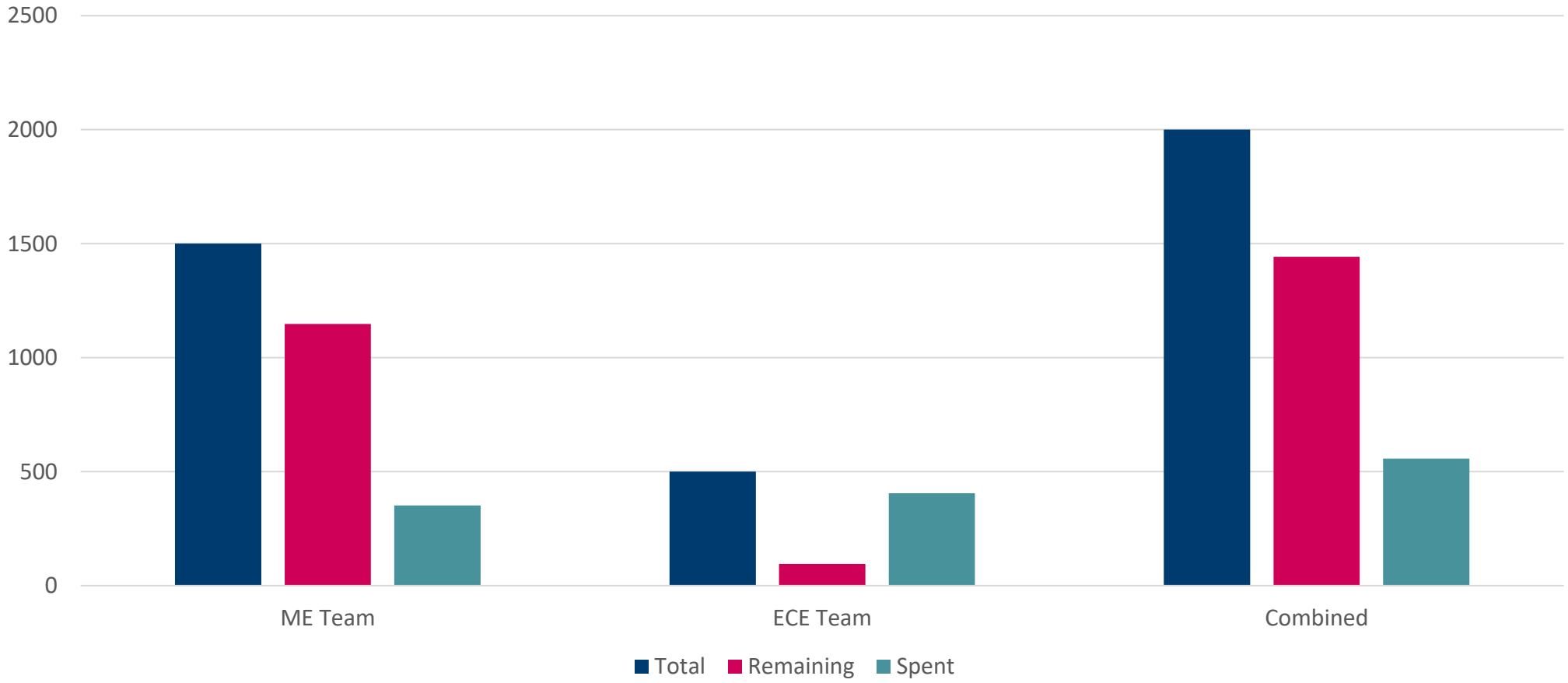


Maximum tilt angle (front and back): 12 degrees

Balancing

- Side-to-side tipping angle: 55 degrees
- Front tipping angle: 50 degrees
- Back tipping angle: 55 degrees

Budget



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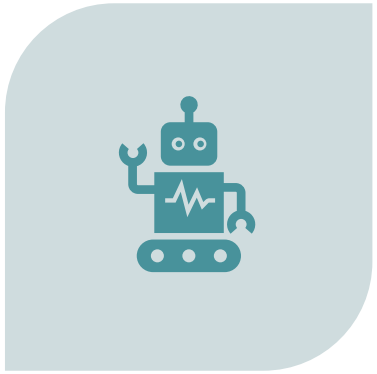
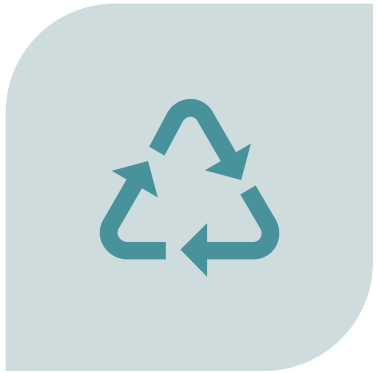
Future Work



WORK WITH THE ECE TEAM TO FINE TUNE THE ROBOT AND PROGRAMMING



WORK TO POLISH THE ROBOT FOR THE FAMU-FSU COLLEGE OF ENGINEERING K-12 OUTREACH

GONE FOR COMPETITION MARCH 27TH - 30TH

Lessons Learned

Kelsey

- How to communicate technical information to a range of individuals
- How to effectively manage a team

Ian

- Communication within ME team and with ECE team
- Importance of testing and validating

Luiz

- Balancing quantity of information delivered while communicating
- Assigning subsystems deliverables is extremely important

Eric

- How to more effectively communicate
- Clearly establish what materials/ hardware will be used early on

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