

Final Project

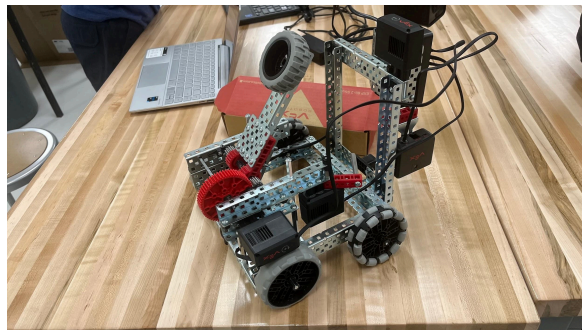
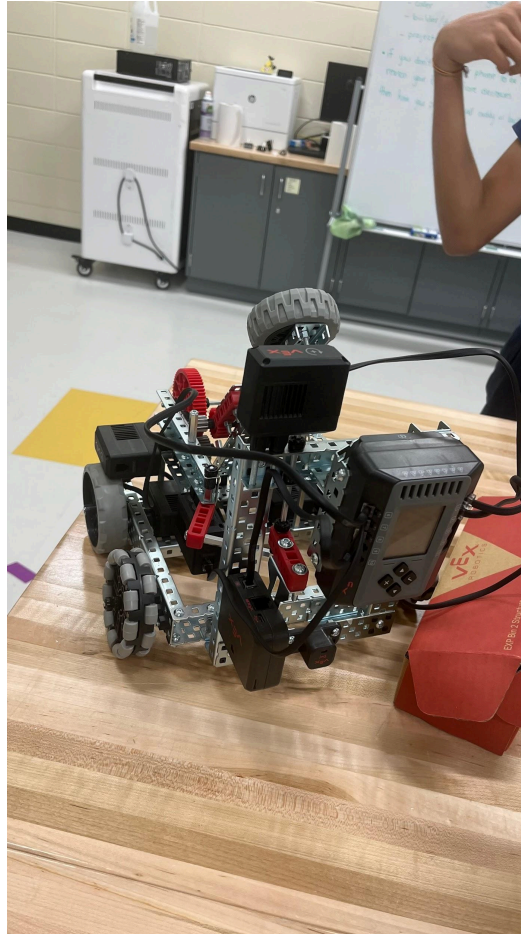
5/18/2023

Goals <i>What are your group's goals for this challenge?</i>	Add a rotating vision sensor on the front of the robot, connect every motor with the brain.
Challenges <i>What challenges did your group run into?</i>	While making the pseudocode, we had to pay attention to the most minor details of what our robot is supposed to do when guarding the intruder. For example, circling the robot around the intruder was difficult to fit in the pseudocode. The whole robot's screws were loose, so I had to tighten all the loose screws.
Accomplishments <i>What accomplishments did you achieve?</i>	I successfully completed the pseudocode for the robot's actual code, addressing all the minor movements that root must complete for its desired goal. I successfully added a rotating vision sensor by using a motor to make it spin. I also tightened all the screws on the robot. Finally I also attached all the cables to the brain. Pseudocode: <ol style="list-style-type: none"> 1. Initialize robot and sensors 2. Initialize variables: <ul style="list-style-type: none"> - intruderDetected = false - objectMissing = false - ownerControl = false 3. Loop: <ol style="list-style-type: none"> a. Move robot in a circular path within the 5ft by 5ft space b. Check sensors: <ul style="list-style-type: none"> - If intruder is detected or object is missing: <ul style="list-style-type: none"> - intruderDetected = true - objectMissing = true - Break from the loop 4. If intruderDetected: <ol style="list-style-type: none"> a. Activate built-in catapult to shoot at the intruder b. If catapult is successful: <ul style="list-style-type: none"> - Reset intruderDetected to false c. Else: <ul style="list-style-type: none"> - Ring an alarm

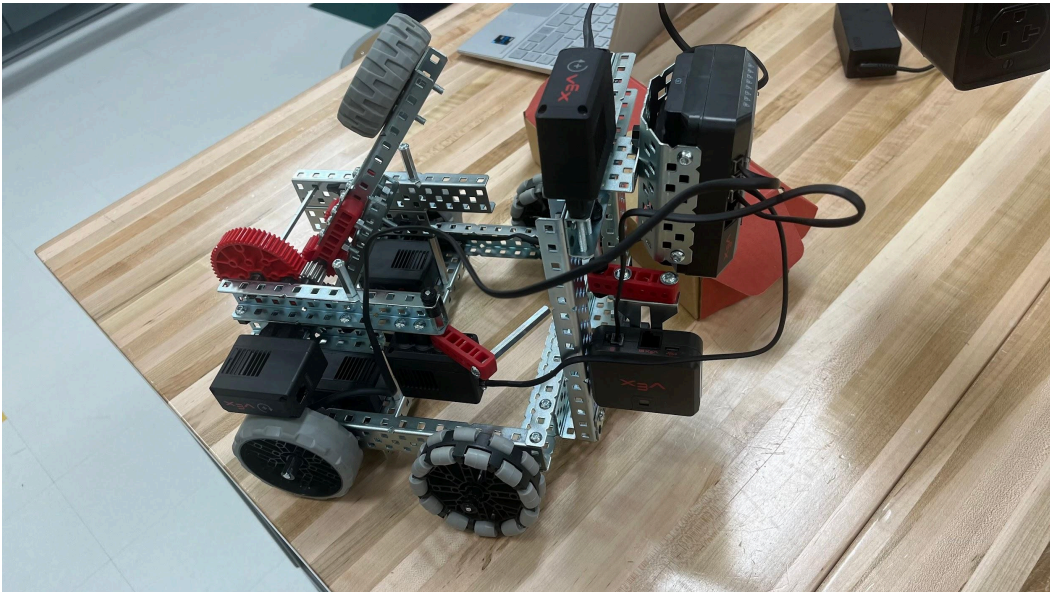
5. If objectMissing:
 - a. Ring an alarm
6. If ownerControl:
 - a. Wait for commands from the remote
 - b. Execute the owner's commands to expel the intruder
7. Repeat the loop

Visuals / imagery

Include photos, scans or screenshots of your process



5/19/2023

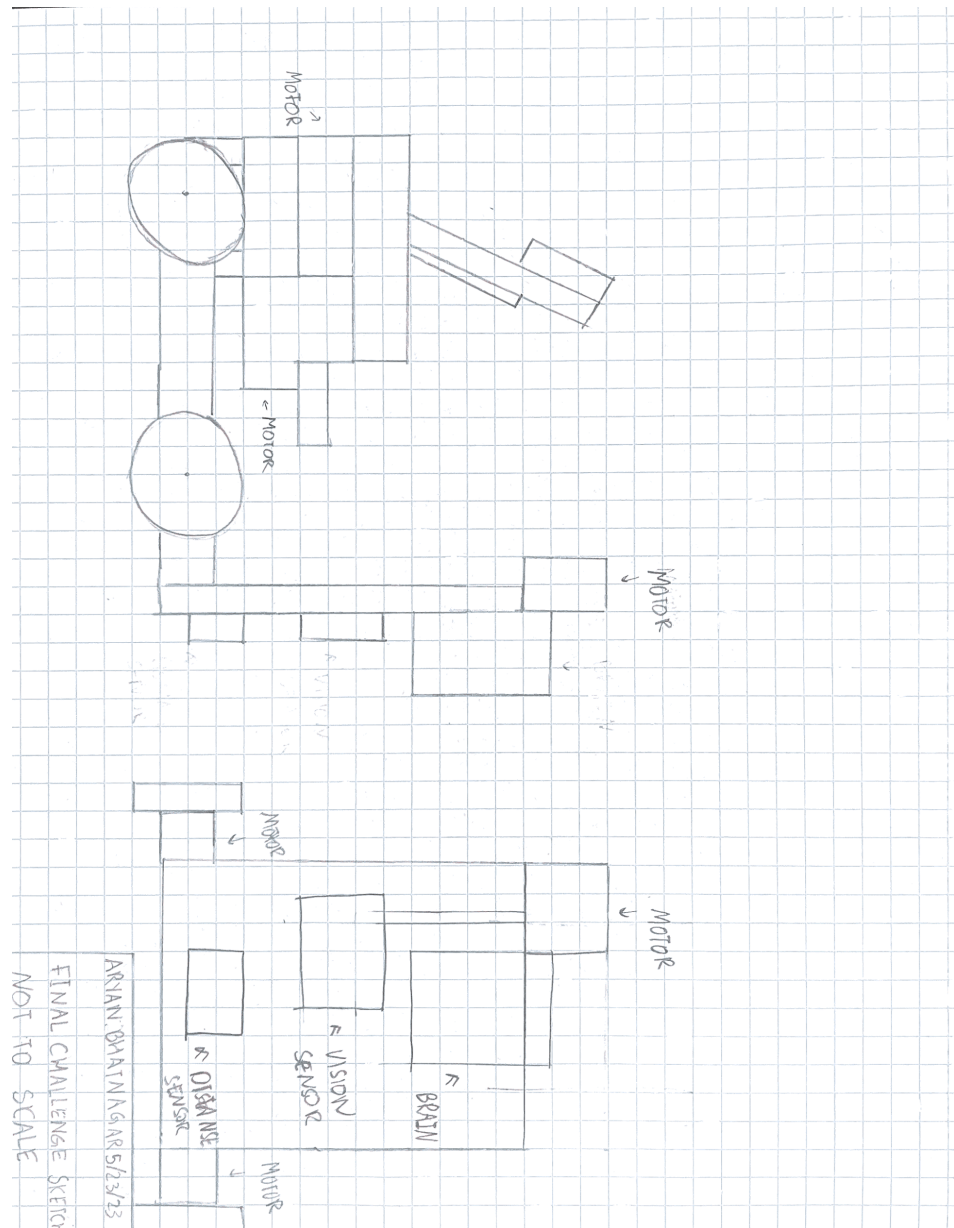
Goals <i>What are your group's goals for this challenge?</i>	<p>Make the catapult better by attaching more rubber bands and making the arm much stronger when launching the ball, increasing its speed. Also, start coding for the motor that stops and releases the catapult to launch the ball.</p> <p>Make the catapult rewind by changing the gear ratio to make the motor stronger, fix the vision sensor that is attached to the motor.</p>
Challenges <i>What challenges did your group run into?</i>	<p>It was difficult to figure out the placement of the rubber bands that would result in the strongest catapult because while testing the bot, the rubber bands kept coming off.</p> <p>Finding the right parts was a little difficult to find, like the right length rod for the vision sensor so it doesn't get in the way of the brain</p>
Accomplishments <i>What accomplishments did you achieve?</i>	<p>We eventually did accomplish the good placement of the rubber bands which made the catapult much stronger than before. We also got a headstart on coding for the motor of the arm.</p> <p>We also adjusted the height of the vision sensor, as well as changed the gear ratio, so it can pull back on it's own</p>
Visuals / imagery <i>Include photos, scans or screenshots of your process</i>	

5/23/2023

Goals <i>What are your group's goals for this challenge?</i>	Sketch the final challenge drawing
Challenges <i>What challenges did your group run into?</i>	Since we didn't have a lot of time we couldn't stretch the final drawing to scale
Accomplishments <i>What accomplishments did you achieve?</i>	We finished sketching the final drawing

Visuals / imagery

Include photos, scans or screenshots of your process



Aryan Bhatnagar

Anikait Sengupta

Arnav Chhajed

Final Project

5/24/2023

page 4

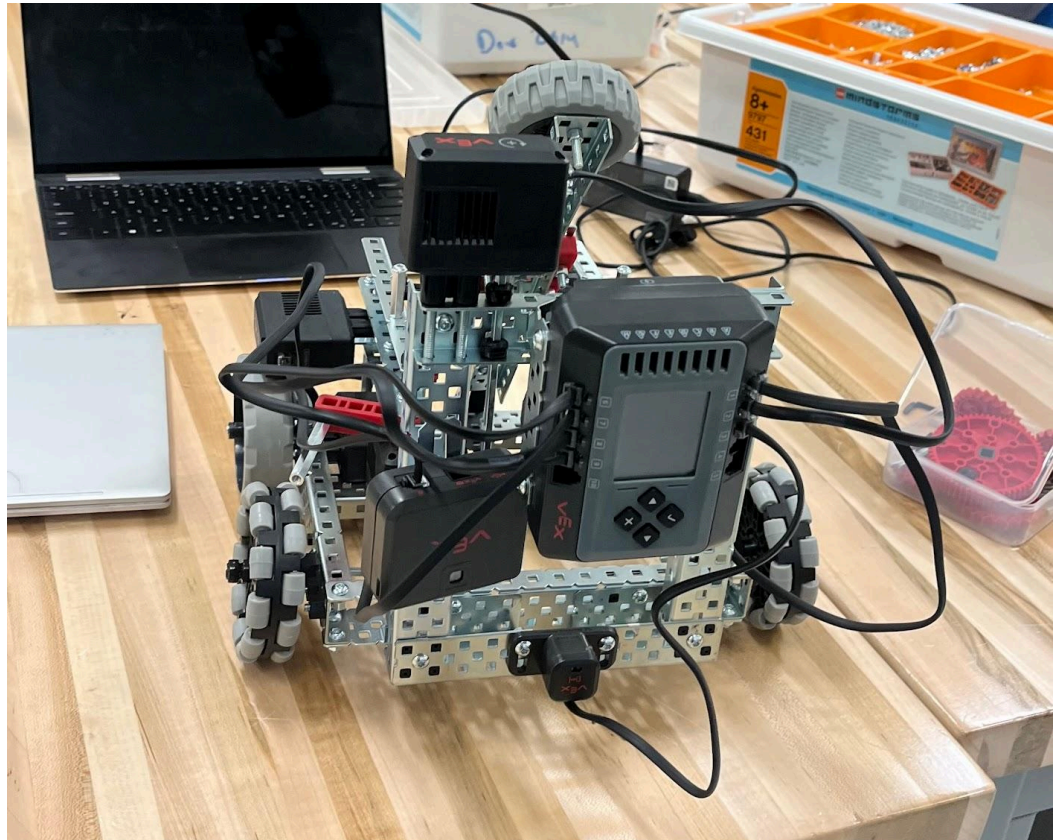
Goals

What are your group's

<i>goals for this challenge?</i>	
Challenges <i>What challenges did your group run into?</i>	
Accomplishments <i>What accomplishments did you achieve?</i>	Pseudocode: <ol style="list-style-type: none"> 1. Initialize robot and sensors 2. Initialize variables: <ul style="list-style-type: none"> - intruderDetected = false - objectMissing = false - ownerControl = false 3. Loop: <ol style="list-style-type: none"> a. Move robot in a circular path within the 5ft by 5ft space b. Check sensors: <ul style="list-style-type: none"> - If intruder is detected or object is missing: <ul style="list-style-type: none"> - intruderDetected = true - objectMissing = true - Break from the loop 4. If intruderDetected: <ol style="list-style-type: none"> a. Activate built-in catapult to shoot at the intruder b. If catapult is successful: <ul style="list-style-type: none"> - Reset intruderDetected to false c. Else: <ul style="list-style-type: none"> - Ring an alarm 5. If objectMissing: <ol style="list-style-type: none"> a. Ring an alarm 6. If ownerControl: <ol style="list-style-type: none"> a. Wait for commands from the remote b. Execute the owner's commands to expel the intruder 7. Repeat the loop

Visuals / imagery

Include photos, scans or screenshots of your process



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Final Project

page 4

5/25/2023

Goals <i>What are your group's goals for this challenge?</i>	Configure the vision sensor in the code to accomplish the first part of sensing the intruder.
Challenges <i>What challenges did your group run into?</i>	We tested the code several times, but there was always some error or needed minor changes, also the time constraint.
Accomplishments <i>What accomplishments did you achieve?</i>	We are almost complete with figuring out the code for the vision sensor and the alarm as well.

Visuals / imagery

Include photos, scans or screenshots of your process

Trial Code:

```
void finalchallenge() {
  CatapultArm.setMaxTorque(100,percent);
  CatapultArm.setVelocity(100,percent);
  while(true) {
    Drivetrain.drive(forward);
    if (!VisionSensor.largestObject.exists) { //if the vision
sensor detects the object missing
    Drivetrain.turnFor(right, 90, degrees);
    CatapultLauncher.setPosition(40, degrees);
    CatapultArm.spinFor(forward, 90, degrees);
    while(!VisionSensor.largestObject.exists) {
      Drivetrain.turn(right);
      Brain.playNote(2, 0, 400);
      Brain.playNote(2, 0, 400);
      Brain.playNote(2, 5, 300);
      Brain.playNote(2, 5, 250);
      Brain.playNote(2, 5, 300);
      Brain.playNote(2, 5, 250);
      Brain.playNote(2, 5, 300);
      Brain.playNote(2, 4, 400);
      Brain.playNote(2, 5, 300);
      Brain.playNote(2, 7, 1000);

      Brain.playNote(2, 0, 400);
      Brain.playNote(2, 0, 400);
      Brain.playNote(2, 7, 350);
      Brain.playNote(2, 7, 350);
      Brain.playNote(2, 7, 350);
      Brain.playNote(2, 7, 350);
      Brain.playNote(2, 7, 350);
      Brain.playNote(2, 5, 400);
      Brain.playNote(2, 7, 300);
      Brain.playNote(2, 9, 1000);

    }
  }
  else{
    if(frontDistance.objectDistance(mm)<200) {
      Drivetrain.turnFor(right, 90, degrees);
      SensorArm.spinToPosition(45, degrees);
      if (!VisionSensor.largestObject.exists) { //if the
vision sensor detects the object missing
```



```
Drivetrain.turnFor(right, 90, degrees);
CatapultLauncher.setPosition(40, degrees);
CatapultArm.spinFor(forward, 90, degrees);
while(!VisionSensor.largestObject.exists) {
    Drivetrain.turn(right);
    Brain.playNote(2, 0, 400);
    Brain.playNote(2, 0, 400);
    Brain.playNote(2, 5, 300);
    Brain.playNote(2, 5, 250);
    Brain.playNote(2, 5, 300);
    Brain.playNote(2, 5, 250);
    Brain.playNote(2, 5, 300);
    Brain.playNote(2, 4, 400);
    Brain.playNote(2, 5, 300);
    Brain.playNote(2, 7, 1000);
```

```
    Brain.playNote(2, 0, 400);
    Brain.playNote(2, 0, 400);
    Brain.playNote(2, 7, 350);
    Brain.playNote(2, 7, 350);
    Brain.playNote(2, 7, 350);
    Brain.playNote(2, 7, 350);
    Brain.playNote(2, 7, 350);
    Brain.playNote(2, 7, 350);
    Brain.playNote(2, 5, 400);
    Brain.playNote(2, 7, 300);
    Brain.playNote(2, 9, 1000);
```

```
}
```

```
}
```

```
else{
```

```
    Drivetrain.driveFor(forward, 10, mm);
```

```
}
```

```
}
```

```
}
```

```
}
```

```
}
```

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Final Project

5/25/2023

Goals <i>What are your group's goals for this challenge?</i>	Complete the base code for the robot motors, configure the vision sensor and the distance sensor.
Challenges <i>What challenges did your group run into?</i>	We are still concerned about the vision sensor after a few tests, as it works sometimes and sometimes not. Configuring the vision sensor is a big challenge in our code for the security bot.
Accomplishments <i>What accomplishments did you achieve?</i>	We just tested several times to configure the vision sensor and we certainly did get closer every time.
Visuals / imagery <i>Include photos, scans or screenshots of your process</i>	<pre>void finalchallenge(){ CatapultArm.setMaxTorque(100,percent); CatapultArm.setVelocity(100,percent); while(true){ Drivetrain.drive(forward); if (!VisionSensor.largestObject.exists) { //if the vision sensor detects the object missing Drivetrain.turnFor(right,90,degrees); CatapultLauncher.setPosition(40,degrees); CatapultArm.spinFor(forward,90,degrees); while(!VisionSensor.largestObject.exists){ Drivetrain.turn(right); Brain.playNote(2,0,400); Brain.playNote(2,0,400); Brain.playNote(2,5,300); Brain.playNote(2,5,250); Brain.playNote(2,5,300); Brain.playNote(2,5,250); Brain.playNote(2,5,300); Brain.playNote(2,4,400); Brain.playNote(2,5,300); Brain.playNote(2,7,1000); } } } }</pre>

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Final Project

5/31/2023

Goals <i>What are your group's goals for this</i>	Finalize the code and test it so it's ready for the final day of testing.
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<i>challenge?</i>	
Challenges <i>What challenges did your group run into?</i>	While testing, we always did have some or the other sensors' configuration gone wrong, we did fix it.
Accomplishments <i>What accomplishments did you achieve?</i>	We have almost completed the code for the final day of testing, just have to revise it once again next class.
Visuals / imagery <i>Include photos, scans or screenshots of your process</i>	<pre> void finalchallenge(){ CatapultArm.setMaxTorque(100,percent); CatapultArm.setVelocity(100,percent); while(true){ Drivetrain.drive(forward); if (!VisionSensor.largestObject.exists) { //if the vision sensor detects the object missing Drivetrain.turnFor(right,90,degrees); CatapultLauncher.setPosition(40,degrees); CatapultArm.spinFor(forward,90,degrees); while(!VisionSensor.largestObject.exists){ Drivetrain.turn(right); Brain.playNote(2,0,400); Brain.playNote(2,0,400); Brain.playNote(2,5,300); Brain.playNote(2,5,250); Brain.playNote(2,5,300); Brain.playNote(2,5,250); Brain.playNote(2,5,300); Brain.playNote(2,4,400); Brain.playNote(2,5,300); Brain.playNote(2,7,1000); } } } } </pre>

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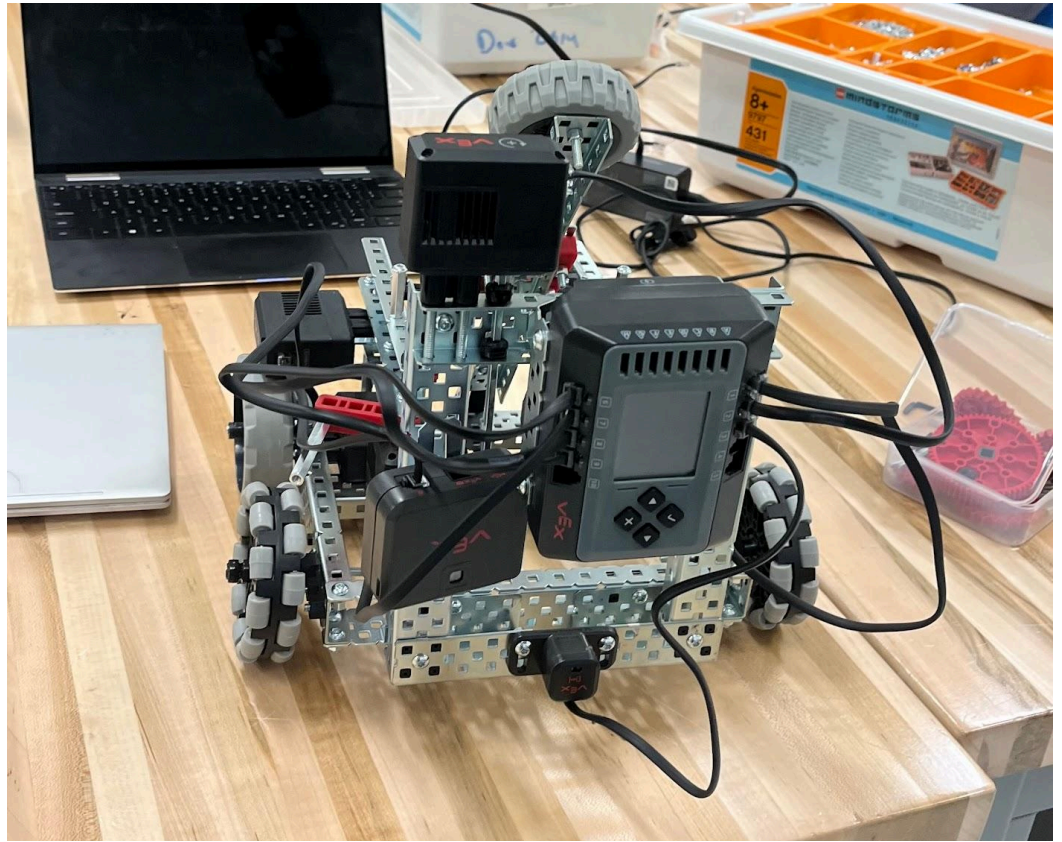
Final Project

6/1/2023

Goals <i>What are your group's goals for this challenge?</i>	Complete the challenge by completing the code for the security bot.
Challenges <i>What challenges did your group run into?</i>	The weight distribution of the robot was an issue preventing the code from working as one the back side was heavier than the front. The rear wheels were not touching the ground
Accomplishments <i>What accomplishments did you achieve?</i>	We fixed the code, it all works now, except the weight distribution of the robot.

Visuals / imagery

Include photos, scans or screenshots of your process



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Final Project

6/5/2023

Goals <i>What are your group's goals for this challenge?</i>	Tighten all the screws that are loose.
Challenges <i>What challenges did your group run into?</i>	The battery wasn't charged so it delayed our testing.
Accomplishments <i>What accomplishments did you achieve?</i>	We charged the battery so we're ready for testing in the next class.
Visuals / imagery	

Include photos, scans or screenshots of your process	
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Final Project

6/13/2023

Goals <i>What are your group's goals for this challenge?</i>	Delayed testing, fix the robot by fixing the physical and coding problems to avoid any last minute during the testing day.
Challenges <i>What challenges did your group run into?</i>	The gyro sensor isn't working so it can't turn 180 degrees before shooting.
Accomplishments <i>What accomplishments did you achieve?</i>	The robot works except for the gyro sensor.
Visuals / imagery <i>Include photos, scans or screenshots of your process</i>	N/A

Final Day of Testing - 6/15/23