CSCI 458: Autonomous Mobile Robotics

Assignment 2: Bumble Bot

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Project Description:

Construct a robot that, using touch sensors, can move around the space it is in. The robot was able to differentiate between bumping into stuff on its left, right, and center and react by backing up and turning.

What Worked:

In order to make the robot run forever we put all our code in an infinite loop. We used setMotorSpeed to make the robot drive straight. After which we we detected bumps of the touch sensors, backed up, and the used random numbers to determine how much to turn. This randomness allowed us a simple way to help prevent getting stuck in tight spaces.

What Didn't Work:

Our design went through 3 design iterations, the first was simply too large (Figure 1). The second was much smaller but had some places where to robot could potentially get stuck (Figure2). With the third iteration we corrected these potential hang ups as in Figure 3. Our first attempt to back up and turn away from obstacles showed us that by turning the same amount each time we could potentially get stuck in tight spaces. We alleviated this by introducing the randomness described above and shown in figure 4.

What we learned from this assignment:

Everything is out to get our robot. The real world is never as predictable as software and it is impossible to plan for everything.

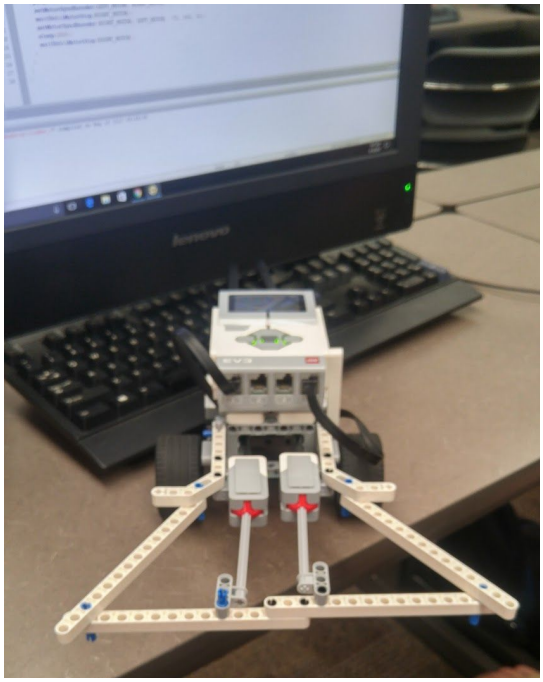

Figure 1: Extremely large bumper.

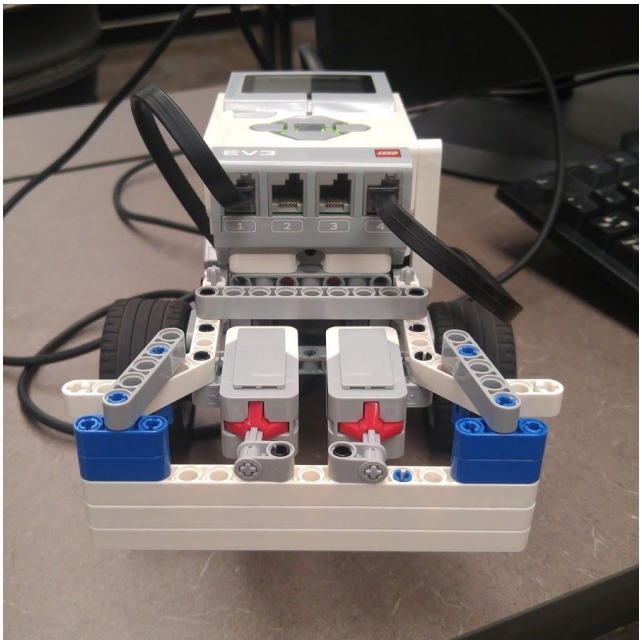

Figure 2: The part of the brackets that are perpendicular to the robot could get caught on stuff in the environment.

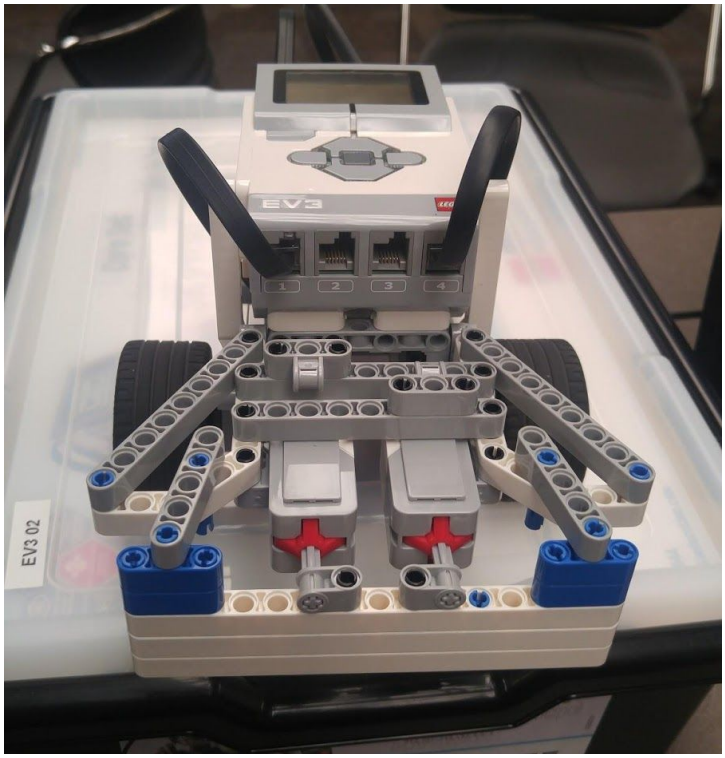

Figure 3: Final design with the smaller bumper and braces that allowed objects to glance off the robot instead of getting caught.

```
waitUntilMotorStop(RIGHT_MOTOR);
setMotorSyncEncoder(LEFT_MOTOR, RIGHT_MOTOR, 50, (500+rand()%500), 50);
```

Figure 4: Robot turns some random amount between half a second and one second.