Engineering 10 Robot

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Introduction

Goals of the project

- To design, build, and program a robot that is capable of completing certain tasks

Purpose of the presentation

- To show the process and the results of robot

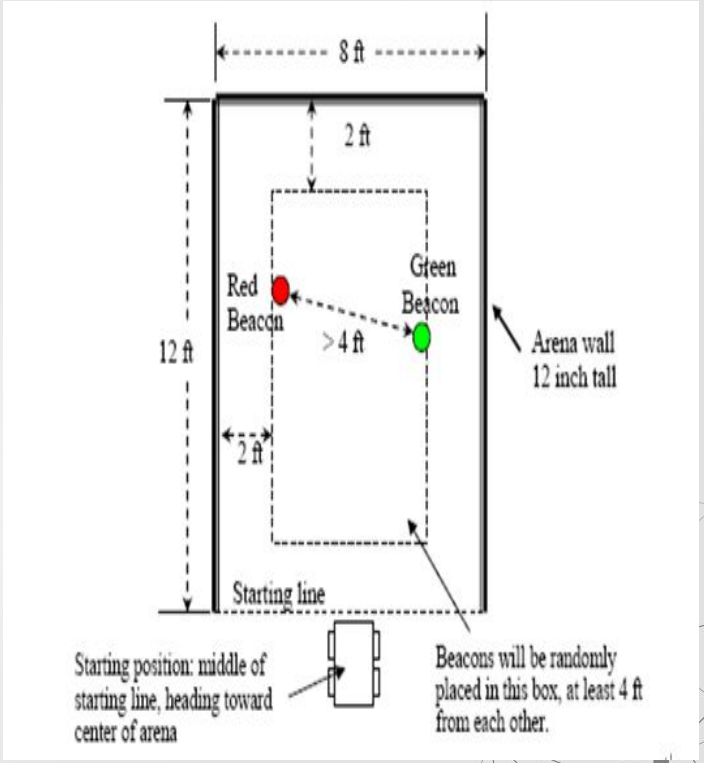

Figure 1: Arena for robot to perform tasks with the two beacons

Electrical

- Followed the directions and assembled the board
- Made sure to solder carefully to avoid a short circuit and to get the connection right

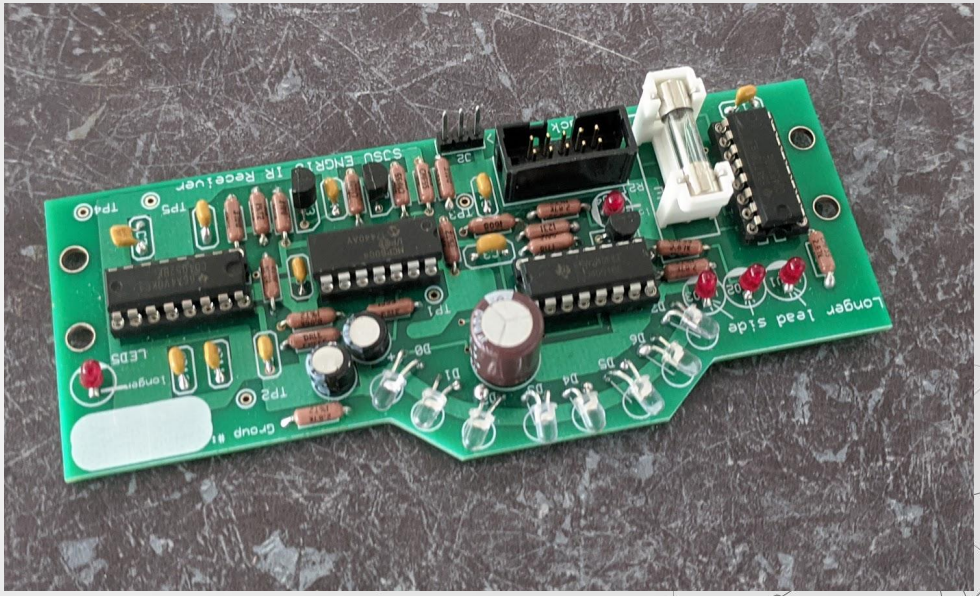

Figure 2: Circuit board needed for the robot to function

Electrical Recommendation

1. Classify each electrical components before soldering
2. Do not use excessive amount of soldering material
3. Clear the working spaces

Mechanical

Base construction followed directions from VEX handbook

For the claw we made a simple but effective design.

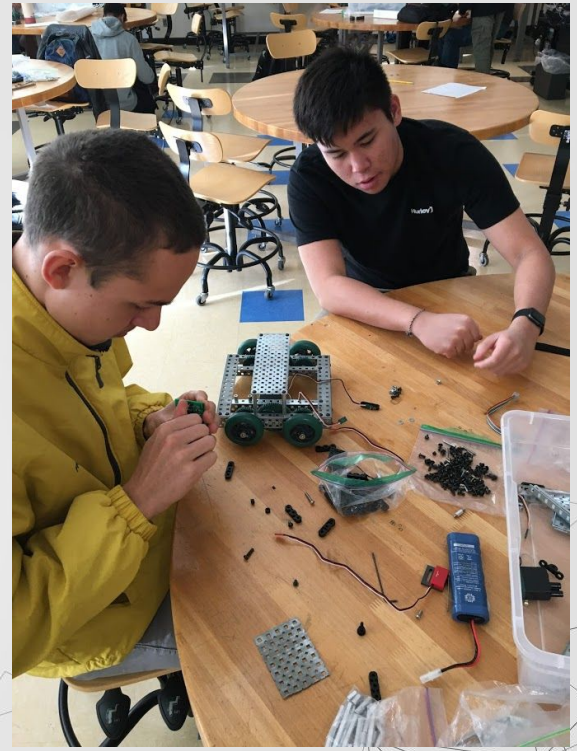

Figure 3

Mechanical Recommendation

1. Make a claw that is able to do both the carrying and the pressing of the button
2. Make sure the claw has a range of motion that will give it enough momentum to press the button
3. Follow the directions for the main frame of the body

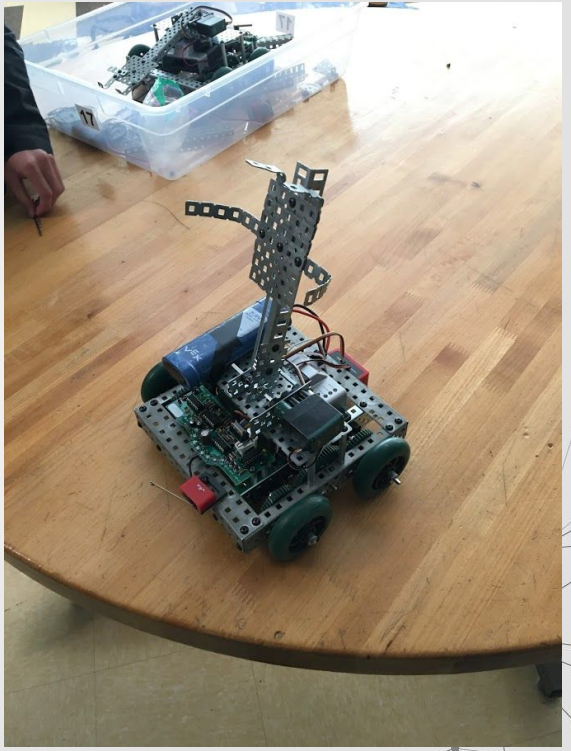

Figure 4

Programming

Goals:

1. Detect/move to Red Beacon
2. Turn Off Red Beacon
3. Detect/move Green Beacon
4. Capture Green Beacon

Time: 49s

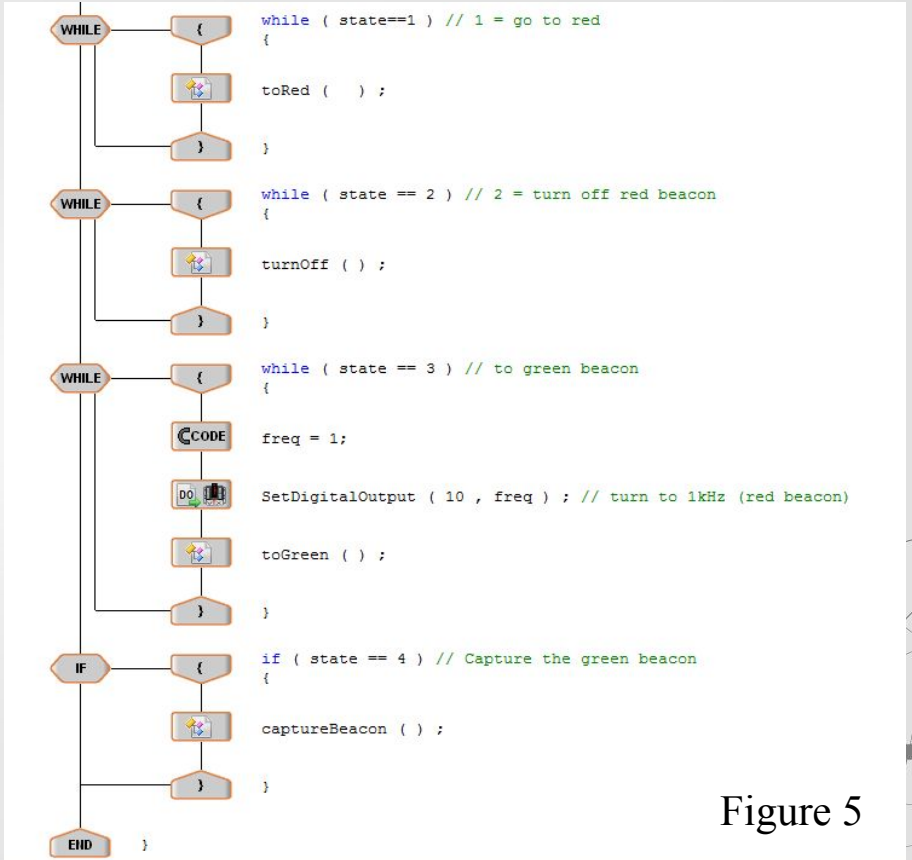

Figure 5

Programming

1. Detect/move to Red Beacon

Used “Go To Beacon Cortex” from E10 Lab website:

-To **find and move**

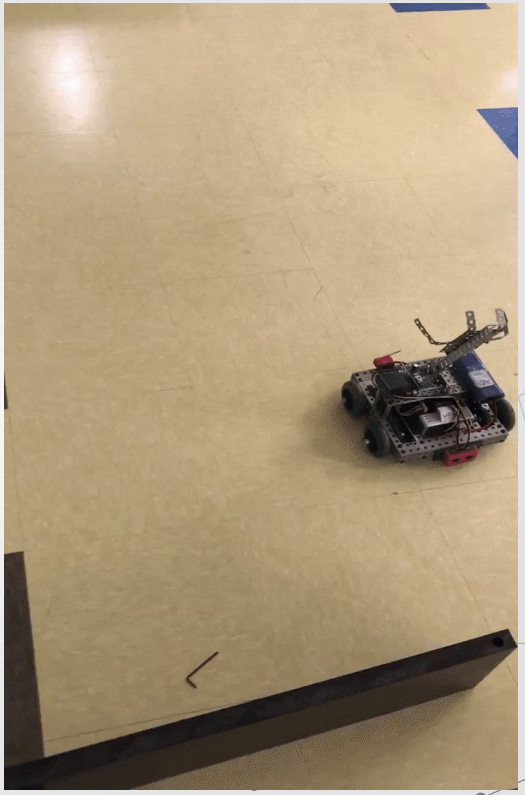

Figure 6

Programming

2. Turn Off Red Beacon

Used “Go To Beacon Cortex” from E10 Lab website:

-To look for **active light**

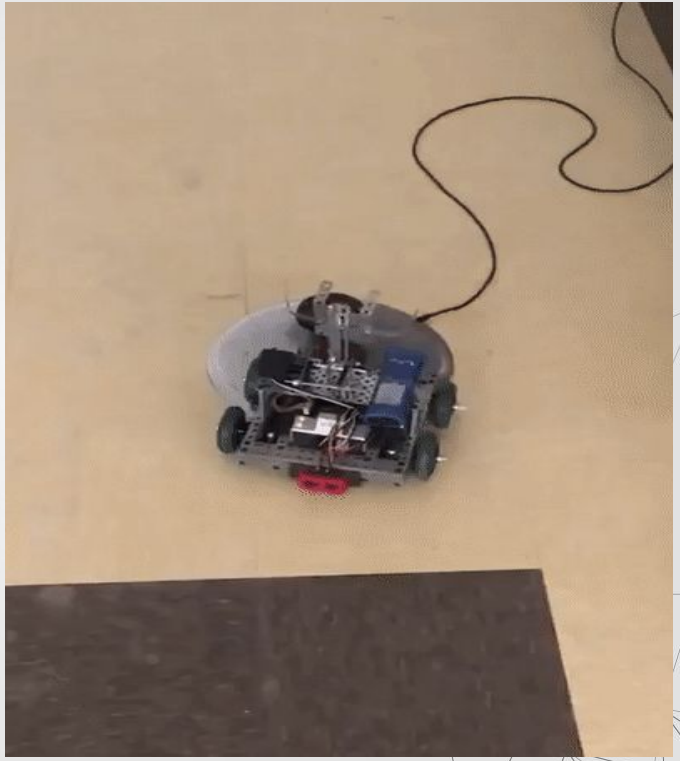

Figure 7

Programming

3. Detect/move to Green Beacon

Used “Go To Beacon Cortex” from E10 Lab website:

-To **find and move**

Figure 8

Programming

4. Capture Green Beacon

Used Ultrasonic Sensor:

-To locate **distance** from obstacle

Figure 9

Programming Choices

1. **No** “Stop Level”
2. Used **limit switch** instead

   Pro: Disregard Light Level

   Con: Accuracy

   Compromise: Lower Speed

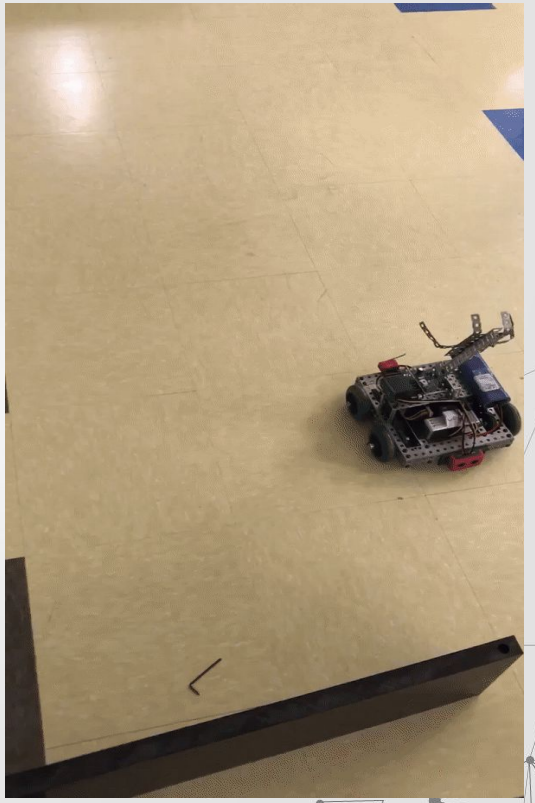

Figure 10

Programming Choices

Ultrasonic

- Pro: simplicity + efficiency
- Con: Processing speed $\propto$ Battery
- Compromise: lower speed, increase reaction distance >20 inches

Figure 11

Programming Recommendation

1. **Set Ambient Level** before search
2. **Calculate Stop Level** from ambient

e^x where x is distance

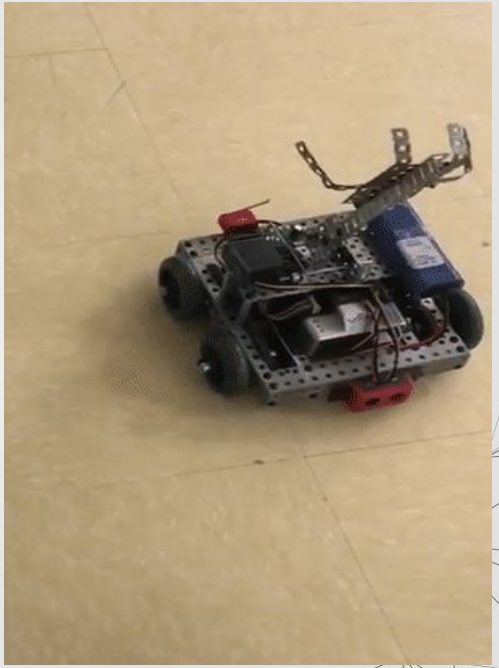

Figure 12

References

- Hsu, P. (2008). RobotProjectGuidelines-F18 [Word document]. Retrieved from https://engineering.sjsu.edu/e10/lab.

- Youssefi, Ken. 11-Robot-Project-Overview [PowerPoint slides]. Retrieved from https://engineering.sjsu.edu/e10/lab.