CPE 470: Auto Mobile Robotics
Team 4
Project 3
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Overview

This week, the project at hand was for our team to build a harvesting robot! The robots functionalities were to roam around the field for exactly one minute and "harvest" any food it encounters. It harvests food, which were color cards and RFID cards, by sensing them with color and RFID sensors and beeps when it encounters one. After it is done harvesting, the sensors were supposed to deactivate and the robots was tasked to find its home. Like our other projects, the project at hand seemed very simple. Have a random movement function to roam the table and then circumnavigates the table until it finds the spot that was labeled as home. After trying to implement the code we soon realized how difficult the problem really was.

Problems/Solutions

The first issue we had with this project was having the robot randomly navigate through the field. We decided to utilize the avoid functionality from the previous project and use that as our pseudo random movement function. The robot would just move in a straight line until it got within range of a wall. Once it got within range it would just veer away from the wall and keep moving. After putting the code into the robot, we realized that our sonar sensors were not set up properly. They were aiming higher than the wall so they would not read properly. That was a quick fix; we just flipped the sensors so they were angled down instead of up.

The next problem was trying to figure out how the robot was going to navigate home. Our initial, and lazy, goal was to just keep it roaming around randomly to see if it will end home by chance. After testing this the robot found its way home after 8 minutes of searching, which is way too long. We then decided to implement a task that overrode all of the other tasks that would act as our going home function. We set it so it would constantly drift to the left so it would find the closest wall. Once it found the wall it was supposed to run around the table, keeping close to the wall. Reason why we had it run around the entire table was because it would eventually head home! We were able to reduce the time from 8 minutes to about 35 to 40 seconds, which is a significant improvement.

Conclusion

Even though our find home function was very weak, we still took a place in the overall competition! Our little robot was able to take third place in the class competition, which is something I am perfectly fine with. I hope that our next competition will prove to be better as we are advancing well with it! Below is a picture of our robot before our competition!