Lab 3: Corner Escape Contest
Team 2
Collin Sorkin and Jesus Sanchez

Introduction

This week's competition was to have the robot go into a tunnel and back out on its own. The teams were judged based on fastest times. At the beginning of class the professor set up a tunnel that consisted of left and right turns, and a dead end. All robots were placed facing into the tunnel at a random angle. The robot then had to navigate its way through the tunnel. A strip of RFID cards was placed near the end to signal the robot that it had reached the end. The robot had to beep to indicate that it had passed the cards. Then it was supposed to turn around and exit the tunnel.

This was a basic competition and we made little changes to our design from the previous lab. We used the sonic sensors and the Codatex RFID sensor.

Hardware and Software Design

Our team decided to use the design from the instruction booklet inside the robot kit. Our team felt that this design was simplistic and was built to handle a task such as the one in Lab 3. For this lab we used two sonar sensors to detect the direction of the robot and used the RFID sensor to sense when we got to the end of the maze.

From the software side the team made the robot play a tone anytime it sensed an RFID card and the tone it played was based on the RFID of the card. With the sonar sensor we had the robot do a turn based on three different distances. The farther away the robot was from the walls of the maze, the robot would make a smaller turn. The closer the robot was to the wall the sharper a turn the robot would make to get away from the wall. This helped when we got to the end of the maze the robot would turn around and try to leave the maze. We calculated the different distances based on testing we did before the contest.

Problems and Solution

The major problem that our team had for this lab was on the hardware side of the contest. The problem that the team encountered was figuring out the best angle to mount both sonar sensors. The team tried many different ways to mount the sensors and the different ways that were tried affected our software problems. This was due to the fact that every time our team made an adjustment on the sensors it would throw off the consistency of the distances that our team was using to sense the wall of the maze.

The way we fixed this problem was just by trial and error. The team would try something and after a couple of test runs if the team did not like the consistency of the test runs the team would adjust the sensors and the code and try again until we were satisfied with the results.

Unsolved Problems

The only real unsolved problem our team had was the inconsistency of the RFID sensor not being able to read the RFID cards when they were lined up in a strip.

Contest Results

The robot performed better in the contest than it did during our test runs. It completed its task in 24.04 seconds, putting us in fourth place out of six teams.

Conclusion

Overall our robot performed better than we expected. It completed the course in a better time than all of our other test runs. Even with all the problems we had with adjusting our sensors on the robot the team still managed to complete the course without any real problems and ended having the fourth best time.

Appendix

Please see the link “corner_escape_V2.nxc” for the code for Lab 3.