The Fire Fighting Robot

New Mexico

Supercomputing Challenge

Final Report

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The Fire Fighting Robot

The purpose of building this robot is for it to extinguish fire without any human control we program it to automatically find a flame and put it out. It has to get through an obstacle course in a certain amount of time and it also has to be the quickest as well. The obstacle course is within an outlined box and the robot has to identify the black line using a light sensor and know that it can not cross it and leave the box. Within the box there are walls and the robot has to also identify them and it can not it hit a wall or knock it down. The robot will do that by using a touch sensor. And the most important part is to find the flame within the obstacle course and extinguishing it by using a Co2 fire extinguisher.

Introduction

Purpose:

The purpose of our project is to extinguish a flame in a certain amount of time and having to get through an obstacle course all at once. The robot has to see a line without crossing it. Touch a wall without knocking it down and identifying a flame and extinguishing it.

Question:

Based on the two variables we are using to extinguish the flame which is the fan and the c02 extinguisher. Which object would be the most effective on extinguishing the flame the most rapidly?

Hypothesis:

Our hypothesis on this project would be that the co2 extinguisher would be the most effective in putting out the flame the quickest opposed to the fan.

Method:

1. First off we needed to get an idea of how we were going to construct the robot and we had to draw it out.

2. We then put an order in for an NXT kit and an IR sensor.

3. Once the NXT kit was purchased we then were able to construct the robot.

4. Once the construction of the robot was complete we then started the programming using the NXT 2.0 software.

5. Once the programming was complete we then made our own course which we practice on it in order to perfect it.

Conclusion:

We have learned that our robot can extinguish a flame correctly the way we programmed it to work. Our hypothesis was correct by the extinguisher extinguishing the flame the quickest. Our results had a number of rounds, the number of rounds were 6 to run the robot. The first round was with the fan, the fan kept blowing but it did turn out the flame. The second and third round was with the fan once again, the fan repeated what had happen in the first round it just kept blowing. The fourth round was with the extinguisher, the extinguisher extinguished the flame once it detected it. The fifth and sixth round was with the extinguisher once again, the extinguisher was able to find the flame but it took awhile to extinguish it, but was automatically able to detect the flame once again and extinguish it completely. We have learned that robots can do a lot of things us humans are capable of doing which in this case is firefighting.

Work sited:

NetLogo. Computer software.

Http://ccl.northwestern.edu/netlogo/docs/transition.html.

NXT Soft ware

Fire Extinguishers- http://www.amerexfireextinguishers.com/