CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
J0910

Project Title
Robot-Computer Communication

Abstract

Objectives/Goals

The invincible tic-tac-toe playing robot, Invictus 2000, challenges you to put your mind to a test. As you play, the robot#s #brain#, the computer, makes hundreds of calculations and decisions based on the inputs from robot sensors, and transmits commands to motors and other robot #muscles#.

As a future roboticist, I wanted to find out which network communication protocol should I use in my robot designs, when response time is the most important requirement.

Methods/Materials

1. Gather materials:
1.1. EV3 robotics kit
1.2. Computer for software development
1.3. Tablet computer for testing
1.4. Visual Studio development environment
1.5. EV3 robotics software
1.6. Wi-Fi network adapter
1.7. Wi-Fi network router
2. Build the robot
3. Program the computer software
4. Program the robot
5. Test Bluetooth interface
6. Test Wi-Fi interface
7. Create a graph
8. Write conclusion

Results

The experiment requested information from the robot in a loop, measuring total response time. The first 10 measurements were done using Bluetooth, and the second group of measurements was done using Wi-Fi. To compare the two groups, mean value was calculated for each group of measurements.

Conclusions/Discussion

The experiment confirmed my theory. Invictus 2000 responded 10.77 % faster when using Wi-Fi, then when it was using Bluetooth to communicate with the computer. In conclusion, Wi-Fi is faster than Bluetooth for Robot-Computer communication.

Summary Statement

Finding the fastest Robot-Computer communication protocol.

Help Received

Father helped with some C# code.