Århus University

Computer Technology

Project 1

Robot Design

Turtlebot3

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Abstract

Define what have we done and talked about in the report.
Set up the general "question" for the report to answer.

Contents

Specifications

Turtlebot-3

What are the Specifications of the project, what was the purpose here?
What do we have to work with?
Details about our robot, and it's sensors system etc.

In this project we are using the Turtlebot3 Burger robot, to practice our ROS based robot programming.
The Turtlebot3 burger uses the Raspberry Pi 3 Model B in combination with an OpenCR 1.0 board to provide us with options for programming and controlling it.
The Raspberry Pi is running Ubuntu 18.04 and is used to run our ROS-modules so that we can implement control and sensor usage for the Burger.

LDS-01 Lidar

Additionally the Burger has a Lidar scanner mounted on top, which we use for the navigation of the Burger.

Raspberry Pi

Raspberry Pi 3 Model B

RGB-sensor

ISL-29125 Model RGB sensor.

Karnaugh Maps

Karnaugh maps or K-maps, is a way to simplify boolean expressions which are too tedious for Boolean algebra. The reduction could be done with Boolean algebra. However, with the Karnaugh map it is faster and easier.

Process

In the following three subtasks we are to simplify the given expressions using boolean algebra.

a.

In week 7 we had problems with being unable to have the robot autonomously drive.
At first the script would run into errors trying to setup and publish subscribers etc. to the ROS environment, the fix for this was to update the OpenCR boards firmware with (i forgor, maybe some push or whatever).
The second problem after having the script output 1 reading, where we expected more, was that the program would halt as the linear speed variable for the robot in this script, was set too high, at 0.22, lowering this to 0.15 fixed the issues, and the robot could now run.

Discussion

How did things go in this project?
Did we do what we wanted, is the robot working, did we learn anything?

Conclusion

Wrap up the abstraction, is it achieved, was the project a success?