

COMP3431

Robotic Software Architecture

Assignment 2: Report

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1 Introduction

In this assignment, both the hardware and software aspects of robotics are explored. The overall objective was to create a robot that could drive autonomously in an outdoor environment, whilst avoiding any obstacles. A motorised wheelchair was the baseline from which the robot was constructed.

To achieve the objective, the robot is equipped with a GPS and compass (using an Android phone with ROS). A laser scanner is also attached to the front of the robot, gathering information about the robot's immediate surroundings.

1.1 Modules

1.1.1 Hardware

1.1.2 Software

On the software side, five/six(?????) modules/nodes run in conjunction to operate the robot: `dest_sender` keeps track of the robot's remaining waypoints.

`gps_drive` publishes the direction in which the robot needs to travel to reach its destination.

`rtk_gps_pub` ...

`laser_safe` publishes movement messages, either directly to the bot's destination, or to avoid an obstacle.

`motordata_arduino_send` ...

`sick_tim` ... (TODO: reference the github)

2 Hardware

3 Software

TODO: Generate rqt_graph of nodes talking to each other

3.1 Planner

destsender

3.2 Localisation

gpsdrive

3.3 Waypoint Traversal

lasersafe, motordata

3.4 Open Source SICK TiM Driver

4 Results

5 Future Work and Improvements

6 Appendix