Introduction to Robotics – Exercise 2

Date of submission – 17/12/19 (14:00:00)

Purpose

- The goal of this assignment is to get you started writing software that controls a (simulated) robot using ROS.
- In this lab you will create a ROS node that will drive the robot around with a simple wanderer algorithm, much like a Roomba robot vacuum cleaner.
- More specifically, the robot should move forward until it reaches an obstacle, then rotate in place **until** the way ahead is clear, then move forward again and repeat

Preparation

- Before you start this assignment, you should make sure that you understand the concepts in ROS tutorials 1-6, 8, 11 or 12, and 13.
- In addition, go over all the code samples from class and make sure you understand them thoroughly (ROS Lectures 1-4).
- Also make sure that the turtlebot_gazebo packages are installed on your machine

Assignment

1. Make a new ROS package called wander_bot, with the appropriate dependencies.
2. **Fill in your name and ID in the package manifest file (not doing that = -10 point**).
3. Copy the launch file in the end of this document into a launch subdirectory of your package. This launch file runs the Gazebo simulator and the wander_bot node that you are going to write.
4. Your task is now to write the wander_bot node. The node should implement a simple algorithm: if the robot is moving sufficiently close to an obstacle in front of it, then rotate it in the direction that is the freest from obstacles until the way ahead is clear;

otherwise move forward by default. You can start from the Stopper node that we have developed in class.

5. Make sure that the wander_bot node works, by running it and watching the robot in the simulator.

Rules

- Use Python (3+) for **this** exercise.
- Make sure that your code is tidy and well-commented.
- All parameter values (such as the rotation speed of the robot) should be **configurable via the launch file.**
- You should do this lab on your own or in pairs. If you use any external sources of inspiration, other than ros.org, then let us know in a README file.
- Specify which ROS distribution you implemented the code in in your README file.

What to Hand In

- You should hand in everything that someone else needs to run your code.
- For this assignment, that means your source code, package.xml, CmakeFiles.txt, and launch files.
- **In the package.xml you should have the line**
- **<author>Jane Doe 111111111<\author>**
- **(for pairs : <author>name1 ID1 name2 ID2<\author>)**
- **with your name and ID number**
- You should **not** hand in executable files, or any other files that can be regenerated.
- Your code should be easy to run.
- After getting a copy of your code, running
- catkin_make --pkg wander_bot roslaunch wander_bot wander_bot.launch should be sufficient to start up Gazebo and make the robot move. Finally, zip all the necessary files and submit the zip file to: https://lemida.biu.ac.il/mod/assign/view.php?id=931204