**Maze Solving Robot**

**1.Introduction**

The algorithm used in this program is called “the left hand algorithm”.

This algorithm can be simplified in 4 conditions:

1. If you can turn left then turn left

2. Else if you can continue driving straight then drive straight

3. Else if you can turn right then turn right

4. If you are at a dead end then turn around

For this algorithm to work successfully there can’t be any loops in the maze.

This algorithm uses 4 infrared(IR) sensors.Two of them for following a straight line and the other 2 for the left or right turn.With this sensors the robot can go throught 90 degree bends,T-junctions and “+” junctions.

**2.Dependencies**

For this program to run optimally you need the next setup:

* Ubuntu 18.04.5 LTS or a Virtual Machine with Ubuntu 18.04.5 LTS
* Gazebo 11
* ROS Melodic Morenia

All the installation tutorials will be in “Chapter 1”

**3.Installation**

All the commands below must be run in a terminal. To open o new terminal press CTRL+ALT+T or RIGHT CLICK and Open Terminal.

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Descriere generată automat

Terminal commands are highlighted in yellow.

We shall execute the following code (Downloading the program from

Github):

line\_maze\_ros

If the download from GitHub is successful, the next message will appear.If the download is successful, the next message will appear.

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**cd line\_follower**

**catkin\_make**

The catkin\_make command is a convenience tool for working with catkin workspaces(a catkin workspace is a folder where you modify, build, and install catkin packages).

For every shell that launches programs you need to run this command, to make sure your workspace is properly overlayed by the setup script.

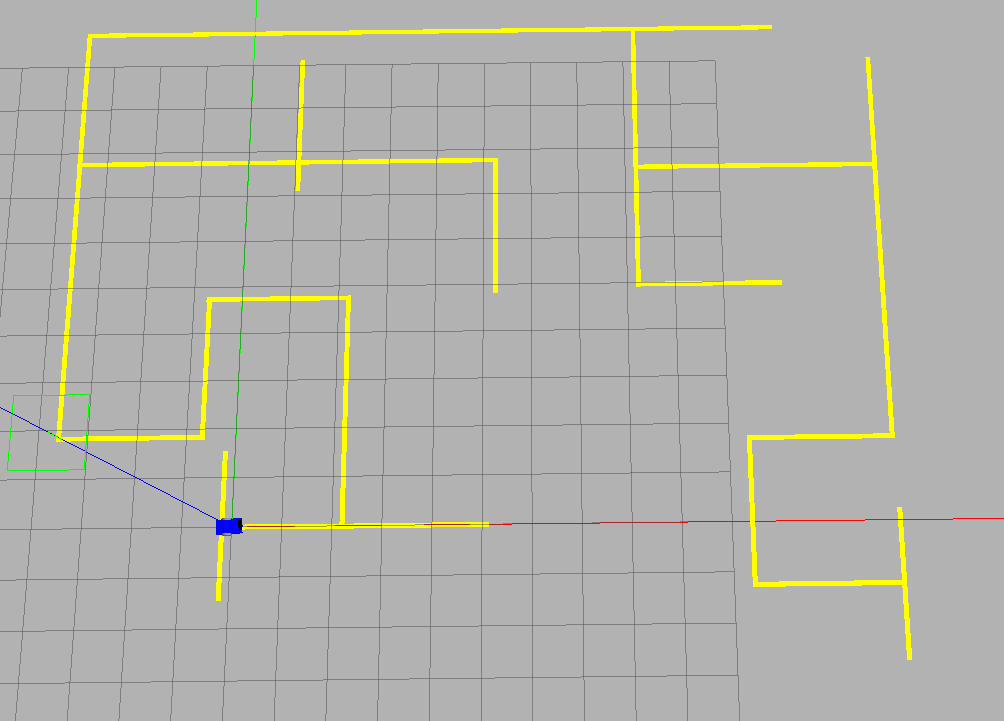
**source devel/setup.bash**

**4.Running the program**

Open the terminal and run the code for spawning the maze and the robot.



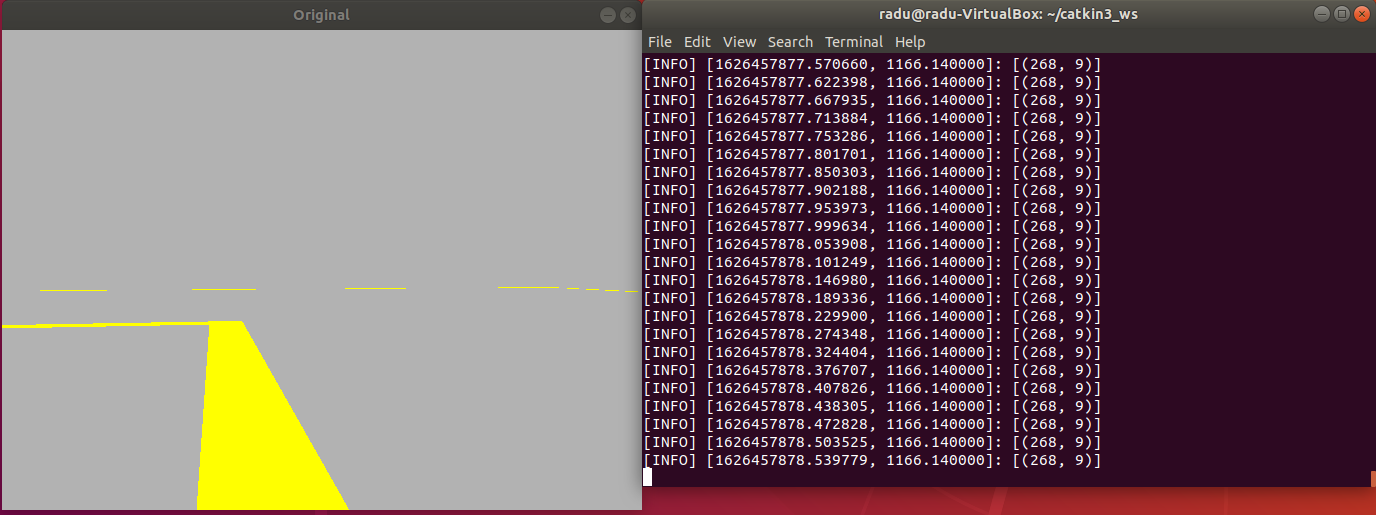
roslaunch line\_maze\_ros line\_follower\_maze\_world.launch

The result should look like this.

Open a new terminal and run the command for the program to start.



rosrun line\_maze\_ros start\_multiple.py



The program will start and you should see the camera view and the commands for the robot.

