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Where Am I?

REVIEW

HISTORY

Meets Specifications

Dear student.

I hope you enjoyed this first project on SLAM. It is a project to get your feet wet with what localization is.

- You also got familiar with a structure of a package
- How to structure one and create launch files
- How to tweak urdf files to create your own custom robots and attach sensors to them.
- How to create a map for a particular world and then use it for localization

Future projects will build on that knowledge

Extra Material

[Interesting Playlist on Localization and Mapping](#)

[Interesting Example of simple localization. Must See](#)

[Monte Carlo Simulation. General Concepts](#)

[Adaptive Monte Carlo Localization](#)

[Monte Carlo Localization for Kidnapped Robot Problem](#)

[Merging Odometry & IMU data for Robot Localization](#)

[Paper: amcl and steering diff vs skid](#)

[amcl map to odom transform](#)

Basic Requirements

Student submitted all required files:

- ROS Package containing AMCL, teleop, robot, world and map files
- Screenshot(s) of localized robot in RViz

Excellent and complete submission. Well done!

- ✓ ROS Package containing AMCL, teleop, robot, world and map files
- ✓ Screenshot(s) of the localized robot in RViz
- ✓ Rviz starts with a correct configuration (all required topics are included)

Important Note

Always provide a Rviz configuration for anyone else to see what you see on your computer. How to do that?

- Create a folder (rviz) and save inside the rviz configuration you created in rviz.
- Then use

```
<node type="rviz" name="rviz" pkg="rviz" args="-d $(find package_name)/rviz/config_file.rviz" />
```

to load a saved configuration to Rviz

Simulation Setup

Student's simulation world and robot could properly load in Gazebo.

- ✓ The robot should be stable when loaded in the environment
- ✓ The environment should not crash.

Student's simulation setup should have the appropriate number of landmarks or geometric features to perform localization.

- ✓ Simulation environment should have clear geometric features for localization.

Localization Setup

Student's launch file contains all required nodes:

Map Server node `map_server`

AMCL node `amcl`

Move Base node `move_base`

The student's program should be able to launch without errors

Everything is setup correctly

- ✓ Contains Map Server Node
- ✓ AMCL Node
- ✓ Move Base Node
- ✓ Launch without Errors

Student filled required parameters for AMCL and move_base in the launch file and the config file

- ✓ AMCL Parameters are filled
- ✓ move_base parameters are filled

If you have some time you will find the following links very useful to expand your knowledge on amcl

External Material

- [ROS Navigation tuning guide](#)
- [set start position of robot within amcl](#)
- [How to Tune Navigational Parameters Using a Graphical Tool?](#)
- [official AMCL documentation](#)
- [How can I disperse amcl particles in specific area?](#)

Localization Performance

Student's robot could quickly localize itself after being tele-operated in the student's world, or given nav_goal target.

- ✓ Robot can localize while driving around

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