🖥 iris-ua / **iris_lama_ros**

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📁 launch	Tweak offline mapping.	8 months ago
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README.md

About

LaMa on ROS

📖 Readme

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Releases

🏷 **1** tags

Packages

No packages published

Contributors 4

🖥 **eupedrosa** E...

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LaMa ROS - Alternative Localization and Mapping for ROS.

https://github.com/iris-ua/iris_lama_ros

![Build Melodic passing]

Developed and maintained by Eurico Pedrosa, University of Aveiro (C) 2019.

Overview

ROS integration of LaMa, a Localization and Mapping package from the **Intelligent Robotics and Systems** (IRIS) Laboratory, University of Aveiro. It provides 2D Localization and SLAM. It works great on a TurtleBot2 with a Raspberry Pi 3 Model B+ and an Hokuyo (Rapid URG).

Build

To build LaMa ROS, clone it from GitHub and use `catkin` to build.

```
mkdir src
cd src
git clone https://github.com/iris-
ua/iris_lama
git clone https://github.com/iris-
ua/iris_lama_ros
cd ..
catkin config --extend /opt/ros/melodic
catkin build
```

The build was tested in **Ubuntu 18.04** with ROS **melodic**. It will not build with `catkin_make` or `catkin_make_isolated`.

facontidavid…

msadowski …

Languages

- ● **C++** 97.9%
- ● **CMake** 2.1%

SLAM nodes

To create a map using *Online SLAM* execute

```
rosrun iris_lama_ros slam2d_ros
scan_topic:=base_scan
```

and to create a map using *Particle Filter SLAM*
execute

```
rosrun iris_lama_ros pf_slam2d_ros
scan_topic:=base_scan
```

Both nodes will publish to expected topics such as
`/map` and `/tf`.

Offline Mapping (rosbag)

If you want to obtain a map from a rosbag and you
want to save time (a lot), you can let iris_lama_ros
"play" the rosbag for you.

```
roslaunch iris_lama_ros
slam2d_offine.launch scan_topic:=base_scan
rosbag:=/path/your/rosbag.bag
```

or

```
roslaunch iris_lama_ros
pf_slam2d_offine.launch
scan_topic:=base_scan rosbag:=/path
/your/rosbag.bag
```

Parameters

- `~global_frame_id` : The frame attached to the
  map (default: "map").
- `~odom_frame_id` : The frame attached to the

odometry system (default: "odometry").

- `~base_frame_id` : The frame attached to the mobile base (default: "base_link").

- `~scan_topic` : Laser scan topic to subscribe (default: "/scan").

- `~initial_pos_x` : Initial x position (default: 0 meters).

- `~initial_pos_y` : Initial y position (default: 0 meters).

- `~initial_pos_a` : Initial rotation (or angle) (default: 0 rad).

- `~d_thresh` : Traveled distance to accumulate before updating (default: 0.01 meters).

- `~a_thresh` : Angular motion to accumulate before updating (default: 0.25 rads).

- `~l2_max` : Maximum distance to use in the dynamic Euclidean distance map (default: 0.5 meters).

- `~resolution` : Resolution of the grid maps (default: 0.05 meters).

- `~patch_size` : Length of a patch (default: 32 cells).

- `~strategy` : Scan matching optimization strategy, GaussNewton ("gm") or Levenberg Marquard ("lm") (default: "gn").

- `~max_iterations` : Maximum number of interations performed by the optimizer (default: 100)

- `~use_compression` : Should the maps be compressed (default: false).

- `~compression_algorithm` : Compression algorithm to use, lz4 or zstd (default: "lz4").

- `~cache_size` : Size of the LRU used during online data compression (default: 100).

- `~mrange` : Maximum laser scan range (default: 16 meters).

- `~map_publish_period` : How long between updates to the map (default: 5 seconds).

Particle Filter SLAM only:

- `~d_thresh` : Traveled distance to accumulate before updating (default: 0.5 meters).
- `~particles` : Number of particles to use (default: 30).
- `~seed` : RNG seed value, use 0 for a random seed from device (default: 0)
- `~threads` : Number of working threads, -1 means disabled and 0 will expand to the available number of cores (default: -1).
- `~sigma` : Measurement variance (default: 0.05).
- `~lgain` : Gain value for smoothing the particles likelihood (default: 3.0).
- `~srr` : Odometry error in rotation as a function of rotation (default: 0.1).
- `~str` : Odometry error in rotation as a function of translation (default: 0.2).
- `~stt` : Odometry error in traslation as a function of translation (default: 0.1).
- `~srt` : Odometry error in translation as a funciton of rotation (default: 0.1).

Localization node

This node requires the existence of the `/static_map` service to load the map. To run the localization just execute

```
rosrun iris_lama_ros loc2d_ros
scan:=base_scan
```

Please use `rviz` to set the initial pose. Global localization is not yet implemented.

Parameters

- `~global_frame_id` : The frame attached to the map (default: "map").
- `~odom_frame_id` : The frame attached to the odometry system (default: "odometry").
- `~base_frame_id` : The frame attached to the mobile base (default: "base_link").
- `~scan_topic` : Laser scan topic to subscribe (default: "/scan").
- `~initial_pos_x` : Initial x position (default: 0 meters).
- `~initial_pos_y` : Initial y position (default: 0 meters).
- `~initial_pos_a` : Initial rotation (or angle) (default: 0 rad).
- `~d_thresh` : Traveled distance to accumulate before updating (default: 0.01 meters).
- `~a_thresh` : Angular motion to accumulate before updating (default: 0.2 rads).
- `~l2_max` : Maximum distance to use in the dynamic Euclidean distance map (default: 0.5 meters).
- `~strategy` : Scan matching optimization strategy, GaussNewton ("gm") or Levenberg Marquard ("lm") (default: "gn").
- `~patch_size` : Length of a patch (default: 32 cells).