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1. Overview

This package contains tools for Velodyne 3D laser scanner (tested with Velodyne HDL-32E). There are three main nodes:

- **Laserscan Node** - simulates conventional 2D scanner by using data from 3D LiDAR.
- **Groundmap Node** - estimates "safe ground" (i.e. not too rough, without high steps and other obstacles) around the robot.
- **Cloud Assembler Node** - combines several consecutive point clouds into a more dense cloud.

Each node has it's nodelet counterpart with same ROS API.

Use GitHub to report bugs or submit feature requests

(https://github.com/robofit/but_velodyne/issues/new). [View active issues (https://github.com/robofit/but_velodyne/issues?page=1&state=open)]

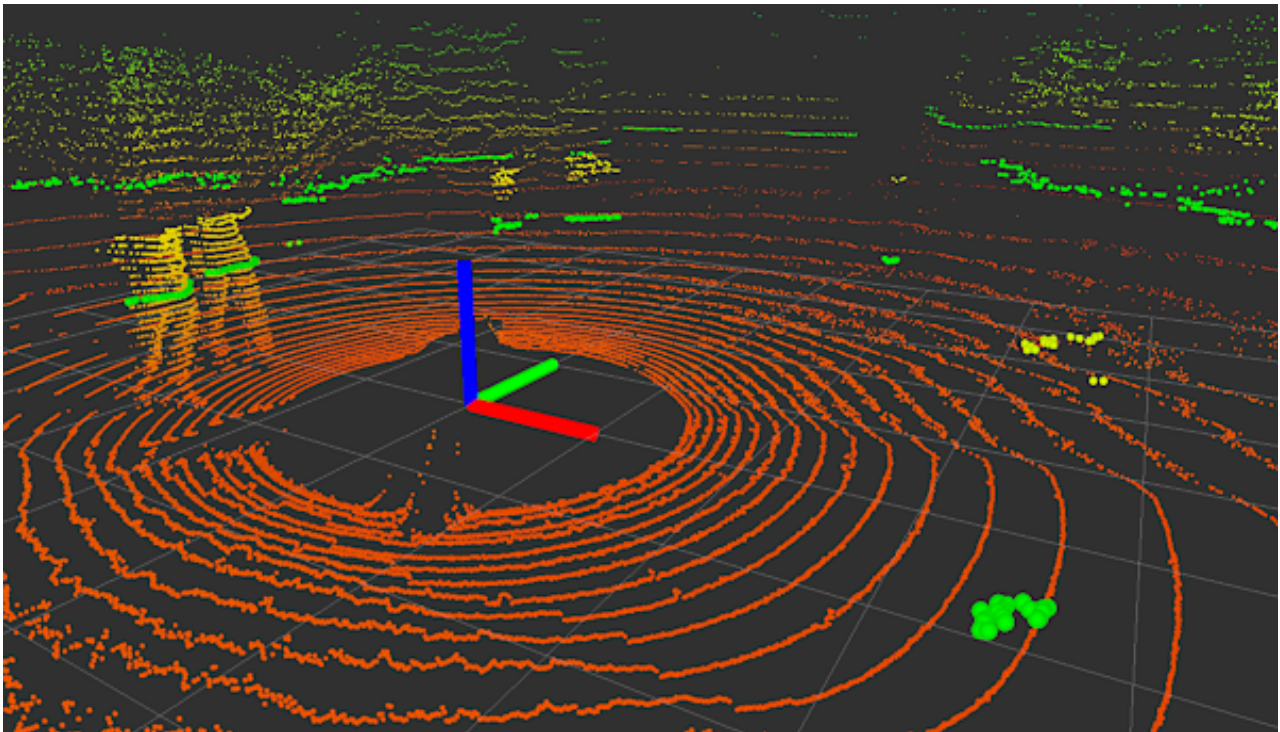
2. Installation

From source:

1. Clone the github repository.
2. Copy the cloned repository into the 'src' folder of your ROS workspace.
3. Recompile your ROS workspace: `$ catkin_make`.

3. Laserscan Node

Uses 3D data to simulate conventional 2D scanner. This way, Velodyne might be used with `move_base (/move_base)`.



Usage example:

Toggle line numbers

```
1 roslaunch but_velodyne_proc laserscan_node.launch
```

3.1 Topics

`points_in` (`sensor_msgs/PointCloud2`
(http://docs.ros.org/api/sensor_msgs/html/msg/PointCloud2.html))

input 3D cloud

`scan_out` (`sensor_msgs/LaserScan`
(http://docs.ros.org/api/sensor_msgs/html/msg/LaserScan.html))
simulated 2D scanner output

3.2 Parameters

`~frame_id` (string, default: "")

output frame_id (will be same as in input data if not specified)

`~min_z` (double, default: "")

points under this height will be discarded

`~max_z` (double, default: "")

points above this height will be discarded

`~angular_res` (double, default: "")

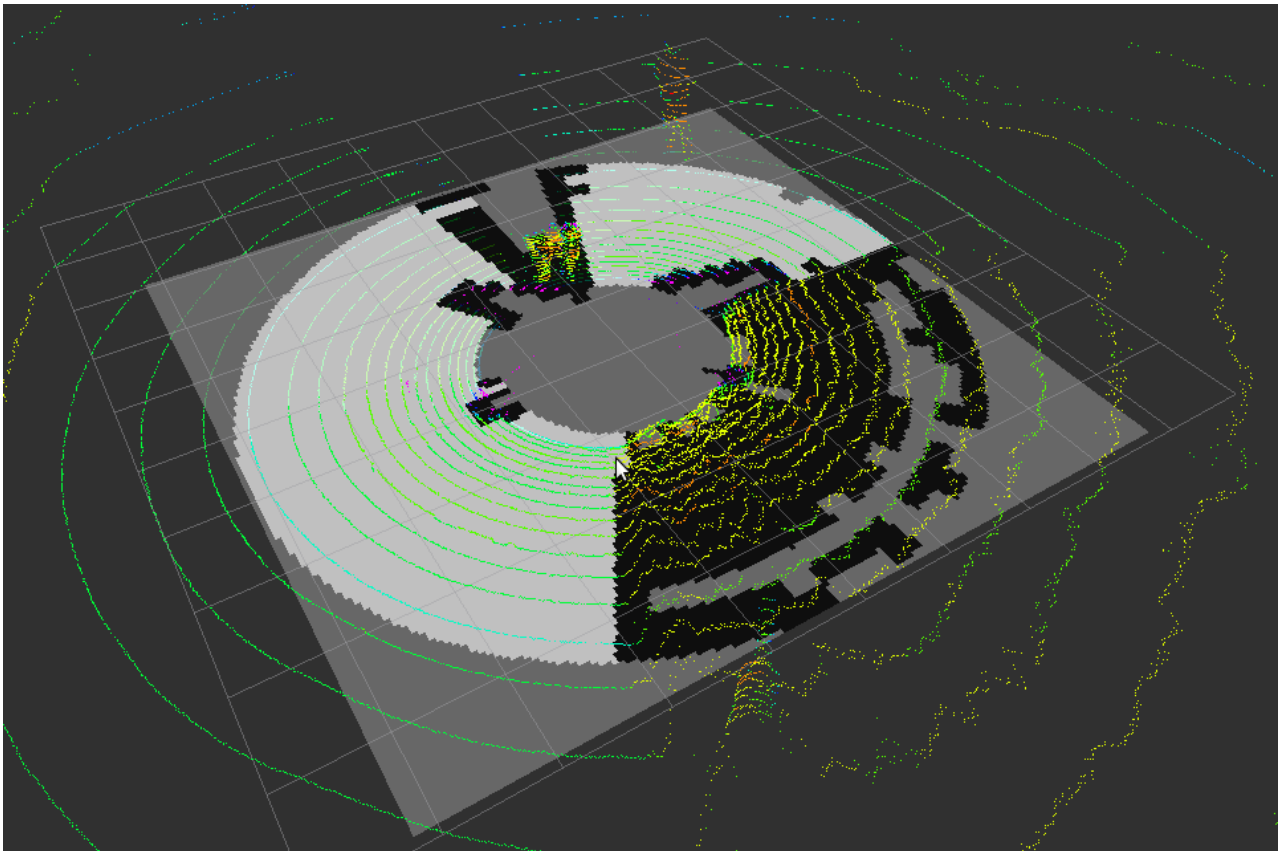
angular resolution (radians)

```
~min_range (double, default: "")
```

points closer to the sensor than this will be discarded

4. Groundmap Node

Estimates frame-to-frame *bumpiness* of robot's surrounding and publishes it as an occupancy grid. This might be used by autonomous rovers supposed to navigate on a rough terrain.



4.1 Topics

```
points_in (sensor_msgs/PointCloud2
```

(http://docs.ros.org/api/sensor_msgs/html/msg/PointCloud2.html))

input 3D cloud

```
map2d_out (nav_msgs/OccupancyGrid
```

(http://docs.ros.org/api/nav_msgs/html/msg/OccupancyGrid.html))

2D map of *bumpiness*

4.2 Parameters

```
~map2d_res (double, default: "0.001")
```

resolution of output 2D map

```
~map2d_width (double, default: "0")
```

width of output 2D map

`~map2d_height` (double, default: "0")
height of output 2D map

`~max_range` (double, default: "0")
points further than *max_range* will be skipped

`~angular_res` (double, default: "0.01")
angular resolution for internal processing

`~radial_res` (double, default: "0.01")
radial resolution for internal processing

`~max_road_irregularity` (double, default: "0")
tbd

`~max_height_diff` (double, default: "0")
tbd

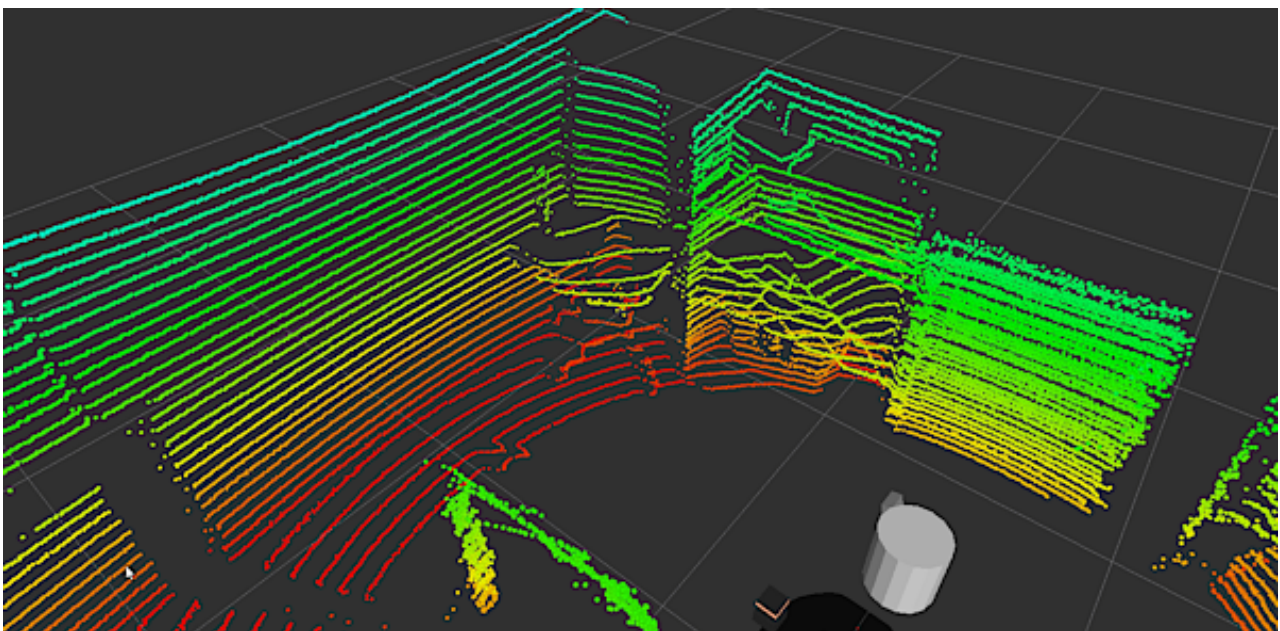
`~noise_filter` (double, default: "true")
simple filtering of isolated *occupied* cells

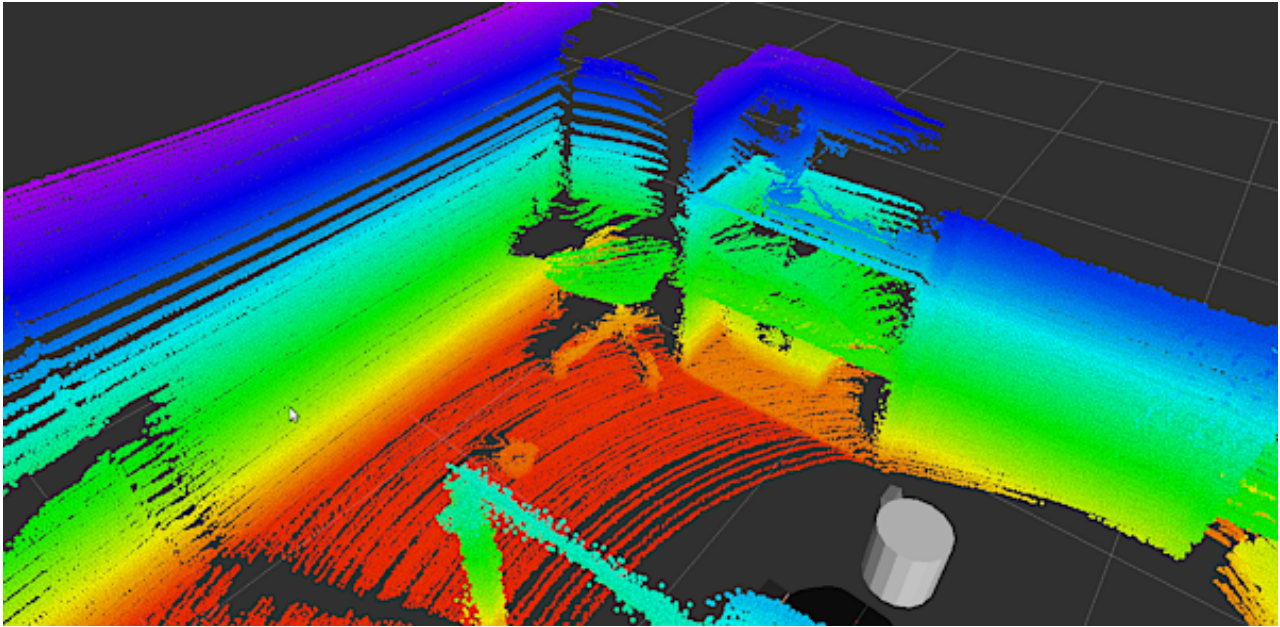
`~ground_prob` (double, default: "")
tbd

`~obstacle_prob` (double, default: "")
tbd

5. Cloud Assembler Node

When a robot is moving, this node combines few historic clouds and the current one to produce denser cloud.






5.1 Topics

`/velodyne_points` (`sensor_msgs/PointCloud2`
(http://docs.ros.org/api/sensor_msgs/html/msg/PointCloud2.html))

input 3D cloud

output (`sensor_msgs/PointCloud2`
(http://docs.ros.org/api/sensor_msgs/html/msg/PointCloud2.html))
dense cloud

Except

where Wiki: but_velodyne_proc (last edited 2014-07-08 09:46:55 by  ZdenekMaterna (<mailto:imatema@fit.vutbr.cz>))

otherwise

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