

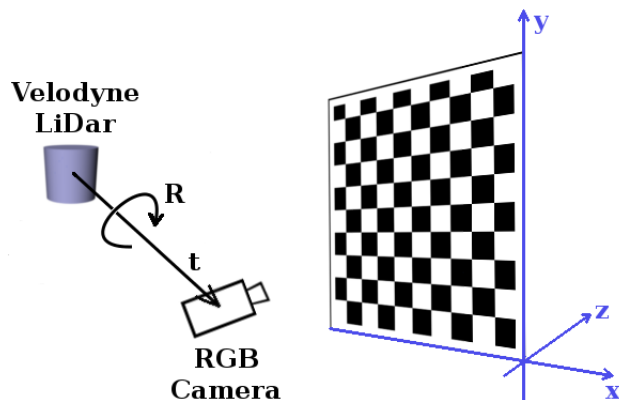
Documentation Status

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but_calibration_camera_velodyne

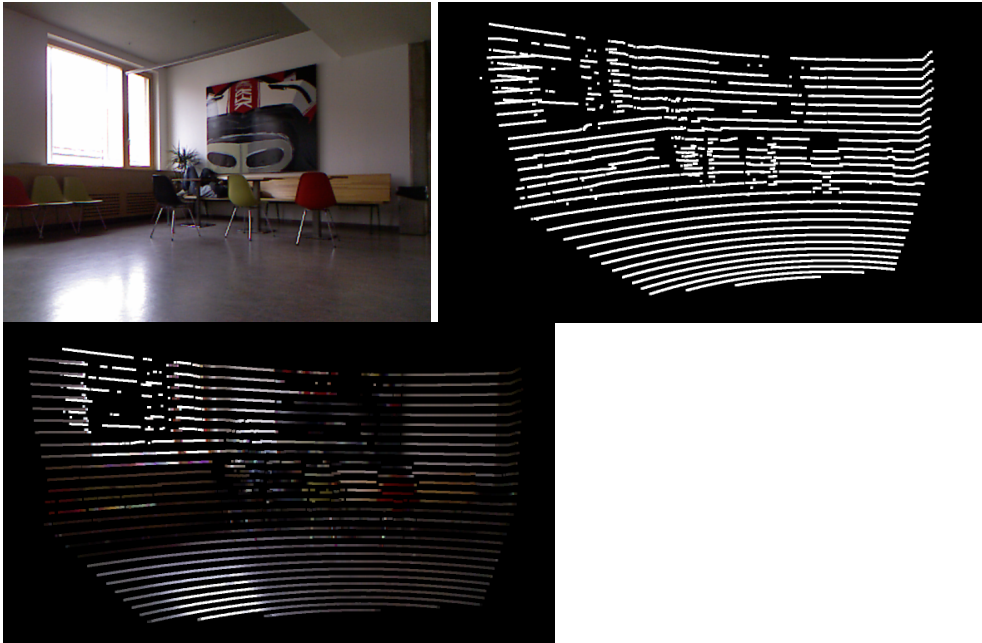
ROS package for calibration camera with Velodyne LiDAR sensor. ROS nodes enable coarse to fine estimation of the calibration parameters (mutual position and the orientation) of the mentioned sensors using novel 3D marker.



The package follows the methods proposed by:

[1] M. Velas, M. Spanel, Z. Materna, A. Herout. Calibration of RGB Camera with Velodyne LiDAR. In *WSCG 2014 Communication papers proceedings*.

Here you can see the example of usage of the computed calibration parameters for the point cloud coloring by the fusion of camera image with the LiDAR point cloud:



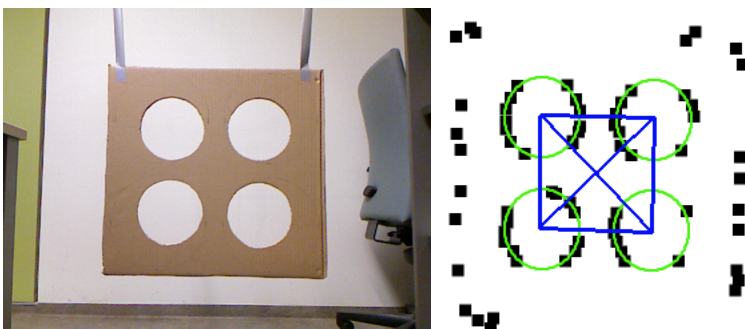
1. Requirements

- ROS Hydro
- PCI 1.7 and
- OpenCV 2.x library

2. Usage

Package contains two ROS nodes for the camera-LiDAR calibration and supplementary one for the publishing coloured pointcloud using precomputed calibration.

For successful calibration the presence of the 3D marker (described in [1]) in the scene is necessary:



Following commands will launch the calibration:

```
roslaunch but_calibration_camera_velodyne calibration_coarse.launch
```

- command will run the coarse calibration using 3D marker (described in the [1])
- if the 3D marker detection fails, the attempt will be repeated after 5s
- upon the success the node ends and prints the 6 Degrees of Freedom of the Velodyne related to the camera

```
roslaunch but_calibration_camera_velodyne calibration_fine.launch
```

- will run the calibration with the refinement. This process will take a longer time (approx. 1 minute)

```
roslaunch but_calibration_camera_velodyne coloring.launch
```

- launches the publisher of colored pointclouds created by the camera -- Velodyne fusion
- the calibration parameters (6DoF) computed by the `calibration` node must be set in configuration file `conf/coloring.yaml` (see below)

3. Configuration

Configuration of the nodes can be done using *.yaml files stored in the `conf/` directory. These parameters in following files can be set:

`conf/calibration.yaml` file contains parameters:

- **camera_frame_topic** : name of the topic, where camera RGB image is published
- **camera_info_topic** : topic of `CameraInfo` type
- **velodyne_topic** : topic, where the Velodyne pointcloud is published
- **marker** : physical size of the 3D marker
 - **circles_distance** : distance between the circles centres (see [1])
 - **circles_radius** : radius of the circles in marker (also see [1])

in `conf/calibration.yaml` file you can specify:

- **6DoF** : vector of the calibration parameters computed by the calibration process
- **velodyne_color_topic** : name of the topic, where the colored pointcloud will be published

Except where

otherwise noted, ^{Wiki: but_calibration_camera_velodyne (last edited 2014-07-08 09:47:14 by MartinVelas (/MartinVelas))}
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