

LOITOR Visual-Inertial Camera

Camera calibration tutorial

Get the intrinsic parameters of VI sensor stereo camera using the ROS tool

Loitor VI Sensor can be calibrated by a stereo camera calibration tool of ROS. The official wiki is as follows:

http://wiki.ros.org/camera_calibration/Tutorials/StereoCalibration

Following the official tutorial steps may leads to the problem of slow sampling in the calibration process , To calibrate Vi-Sensor more quickly using this tool more quickly, you can refer to the following steps:

1. Install the calibration tool and enter it at the command line:

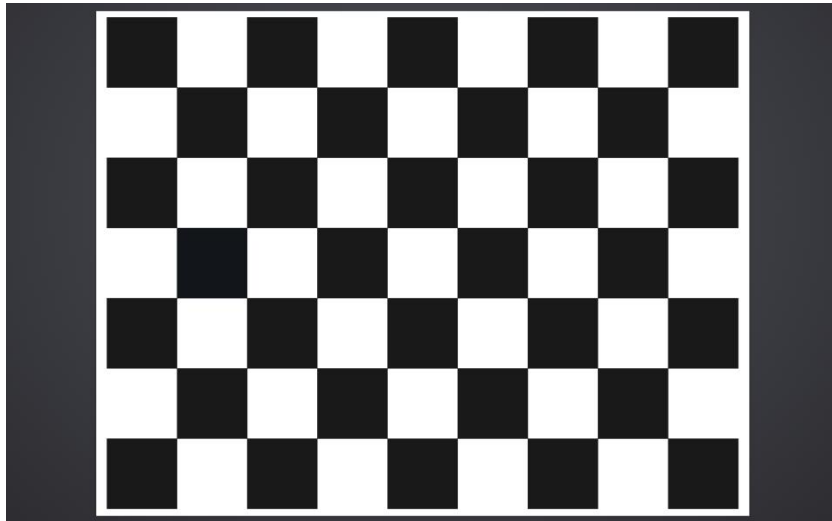
```
rosdep install camera_calibration  
rosmake camera_calibration
```

2. Activate the Vi-Sensor ROS Driver

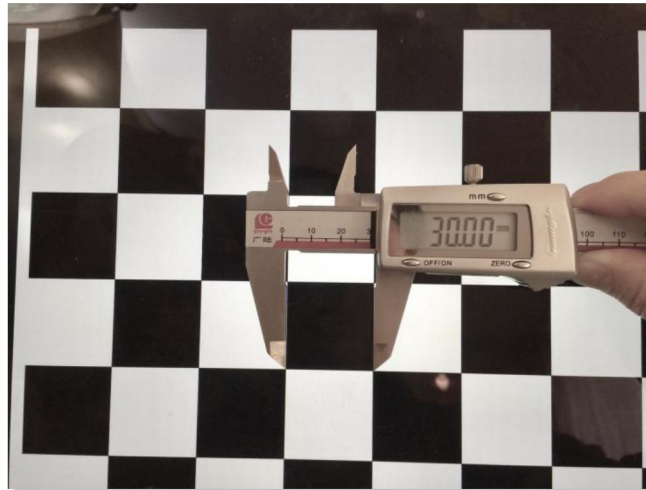
For a compilation of the Vi-Sensor ROS driver and how to start it, refer to section 4.4 of the product brochure

3. Prepare to calibrate the chessboard

We use OPENCV 2.4.9 officially provided 8x6 corner checkerboard, the default cell size is 30mm.



You can print this board to A4 paper in the size of "1:1".

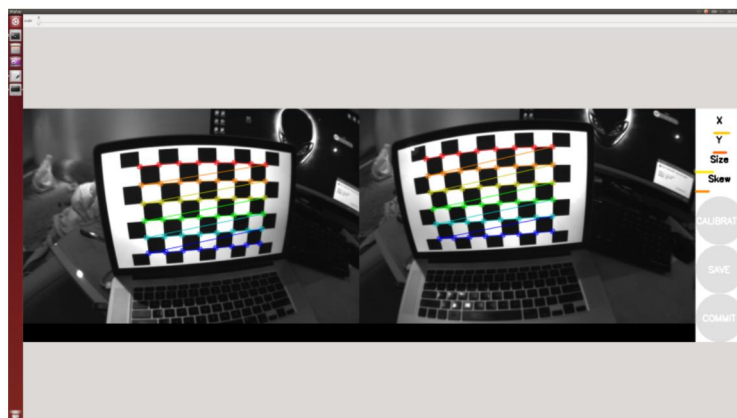


After you have prepared the chessboard, use vernier caliper to measure the size of the cell, as shown below:

Converts the cell size of the calibrated checkerboard to a unit meter, instead of the red number in the following command:

```
roslaunch camera_calibration cameracalibrator.py --size 8x6 --square 0.03 --no-service-check
--approximate=0.1 right:=/camera/right/image_raw left:=/camera/left/image_raw right_camera:=/camera/right
left_camera:=/camera/left
```

Enter the above command on the command line, align the camera to the board and start the calibration

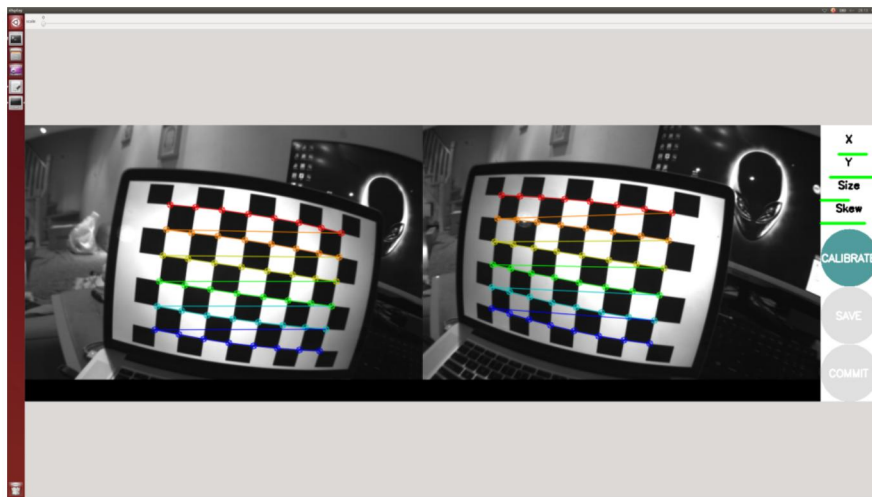


interface:

How to judge the calibration data has been collected and completed:

Keep moving your camera so that the calibration program takes pictures from different angles.

Once the "Calibrate" button of the calibration interface becomes blue, it means that the collection is



complete and can be internal calculated:

After completing the data acquisition, click on the Calibrate button once, wait 1 minutes or so will appear calibration results:

```
distortion
-0.377938 0.120196 0.000391 -0.003575 0.000000

rectification
0.999903 -0.007669 0.011665
0.007757 0.999942 -0.007531
-0.011607 0.007621 0.999904

projection
455.128894 0.000000 355.618809 0.000000
0.000000 455.128894 255.608704 0.000000
0.000000 0.000000 1.000000 0.000000

# oST version 5.0 parameters

[image]
width
752
height
480

[narrow_stereo/right]
camera matrix
456.550935 0.000000 364.306222
0.000000 456.454410 248.672337
0.000000 0.000000 1.000000

distortion
-0.402009 0.136511 -0.000952 -0.000270 0.000000

rectification
0.999970 -0.003817 0.005753
0.003773 0.999964 0.007587
-0.005782 -0.007565 0.999955

projection
455.128894 0.000000 355.618809 -45.496679
0.000000 455.128894 255.608704 0.000000
0.000000 0.000000 1.000000 0.000000
```

The calibrated GUI interface will show the image after real-time distortion correction, and you can evaluate the accuracy of the current calibration parameters based on the corrected effect of the displayed image (if the correction is not satisfactory, it can be calibrated):

Running ORB Slam2

1. Please make sure you have finished compiling and installed the ORB Slam2 ROS program.
2. Note: Verify that the current resolution of the sensor is set to WVGA format, otherwise the run ORB Slam2 may cause an error
3. You can start Orb Slam2 by entering the ORB Slam2 ROS boot command on the command line