Optor Visual Interial Camera

Camera Calibration Tutorial

V0.3

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

Optor 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

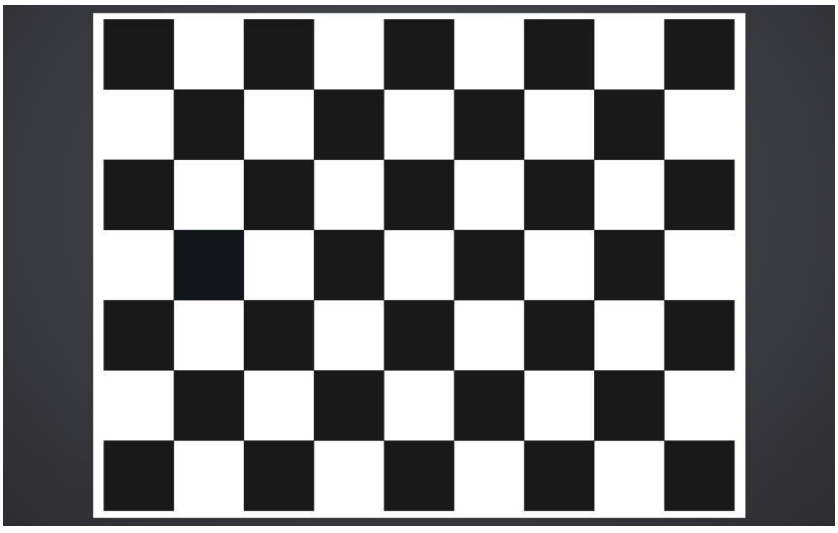
camera_calibration

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

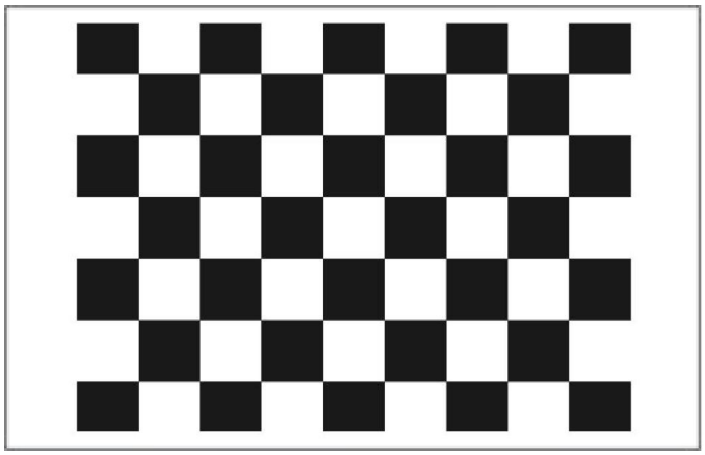
We use OPENCV 2.4.9 officially provided 8x6 corner checkerboard, the default cell size is 30mm.



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

Here we use the 15-inch MacBook Pro screen as the calibration board, for in the Mac OS Preview tool, you can choose actual size to display PDFs. This allows the checkerboard cell size to render an exact 30mm and screen display also ensures absolute flatness of the calibration board.

If you're using a 15-inch MacBook Pro，Please use the "MAC. png" screen in the root directory and click "Actual Size."



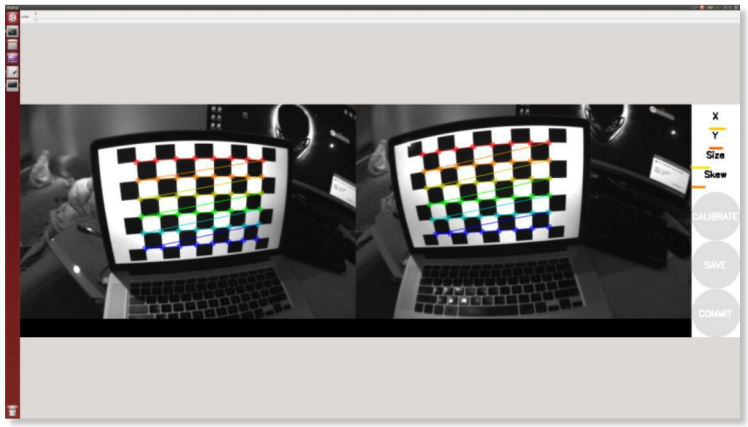
4. Accurately measure the cell size of the calibrated checkerboard

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

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

rosrun 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

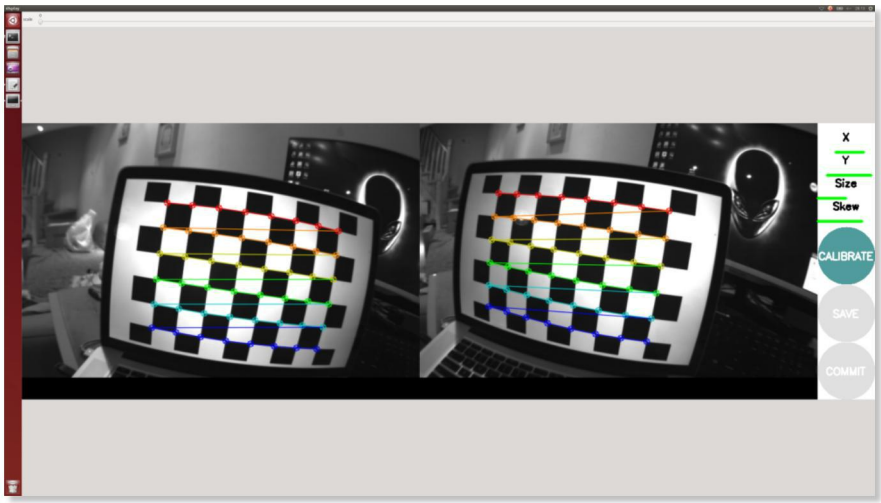
6. Enter the above command on the command line, align the camera to the board and start the calibration interface:



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

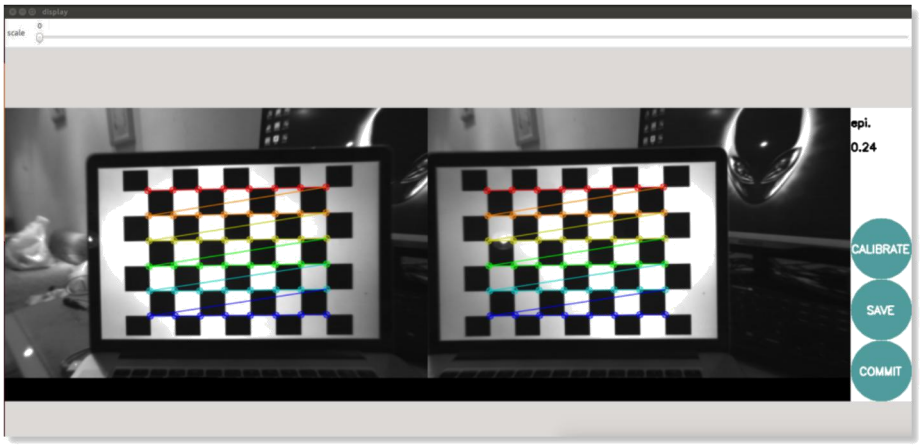
Keep moving your camera so that the calibration program takes pictures from different angles.

Once the "Calibrate" button of the calibration interface becomes blue, it means that the collection is complete and can be internal calculated:



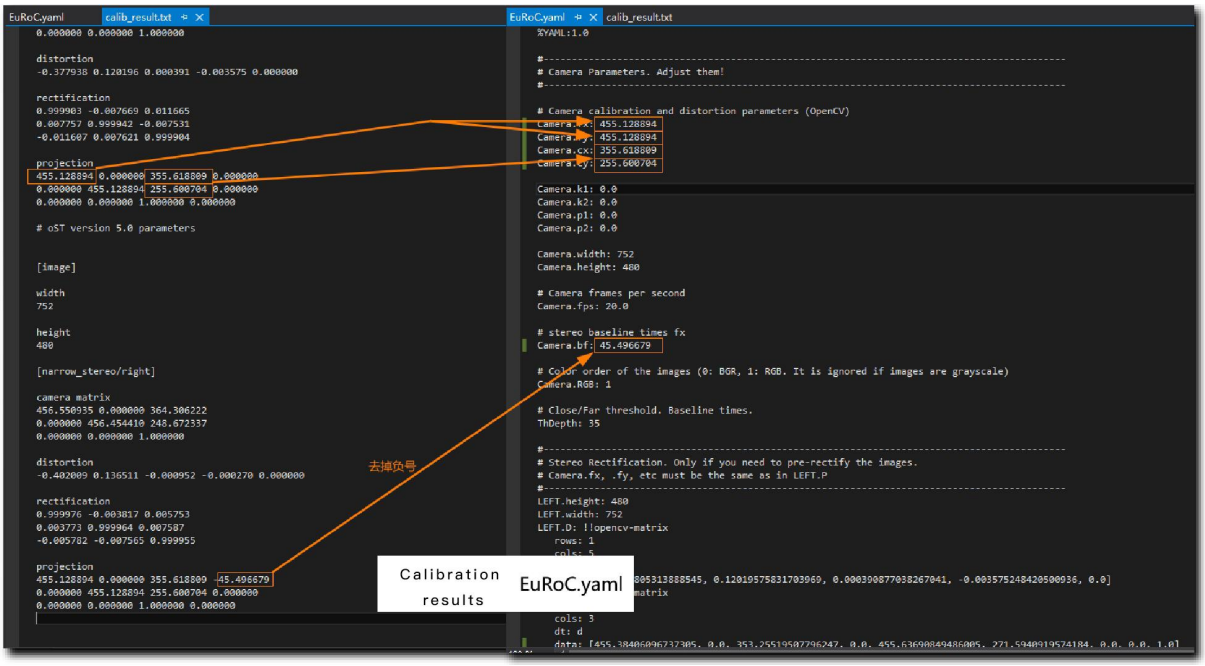
8. After completing the data acquisition, click on the Calibrate button once, wait 1 minutes or so will appear calibration results:

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):

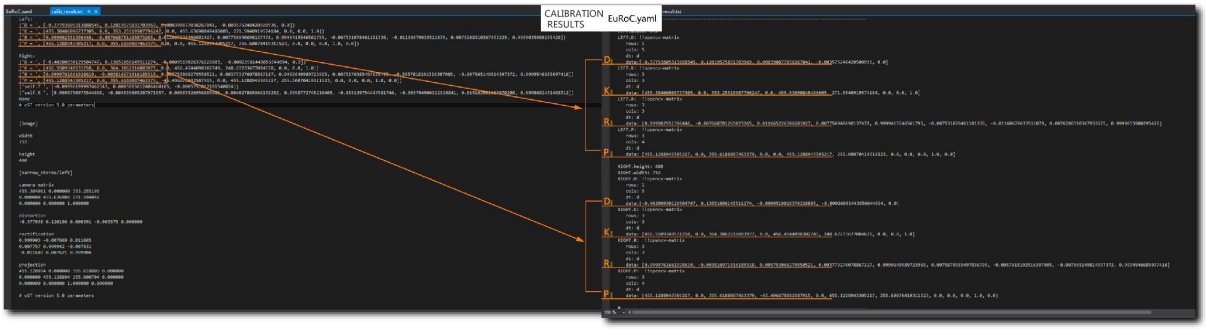


9. The corresponding relation between the calibration result and the parameters in Euroc. Yaml.

Before running ORB Slam2, please press the figure below to modify the "Yaxamples Steroc. Yaml" Profile



Replication of normalized pinhole camera model parameters



Copying left and right camera parameters

10. 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.