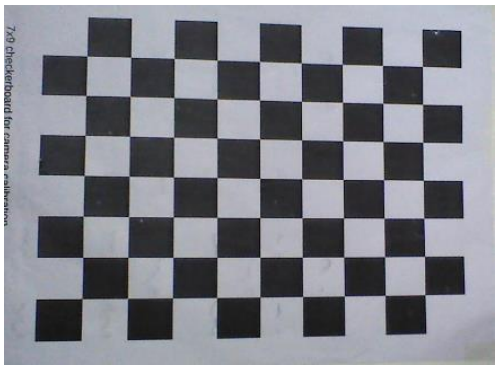
How to Calibrate Orbbec Astra and Astra S

v1.1.2 2016.06.30

This document describes how to do a calibration on IR and RGB cameras of Orbbec Astra and Astra S. The tools we provide will update periodically. **The calibration result can be used to improve the RGBD registration.**

Step 0. Print Calibration Plate

- Print **7x9 checkerboard for camera calibration-0428.pdf** on a paper. If you do calibration within 1.6 meter, you can use a piece of A1 paper;
- Measure the size of the grid on the paper. Fill the value into **StereoCalib\config.ini**
- For example, if the size of the grid is 96mm x 96mm, you should revise the config.ini as follow:
  - **[size]**
  - **sx = 96.0**
  - **sy = 96.0**



Step 1. Run Calibrationtool.exe

- Choose the Resolution in **\Calibration\config.ini** and **\AstraViewer\Redist\ config.ini**. and make sure the resolution are the same in the two config files.
- Run **calibrationtool.exe**
- Capture at least **15** pair of images of the calibration plate
  - Fix the position of the plate
  - Press ‘s’ to capture a pair of IR and RGB image
  - Change the position and angle of the plate and start over (See **Note 4**)

Note 1: for each position, one IR and one RGB image will be saved under **CapturedFrames0**

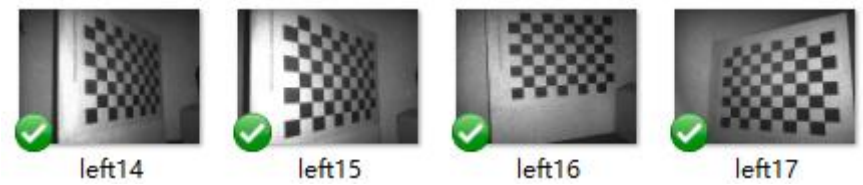
Note 2: block the laser using a diffuser or piece of thin paper when capturing images

(see example below);

Note 3: you can capture **more than 15 pair of images**;

Note 4: How to change the position of the plate (Highly Recommended):

- **Get your camera fixed;**
- **Set the distance between the plate and the camera to 1.6m, capture 4 - 6 pair of images. Rotate and tilt the plate to a different angle for each pair. Image below shows typical positions, rotate 90 degree is recommended;**



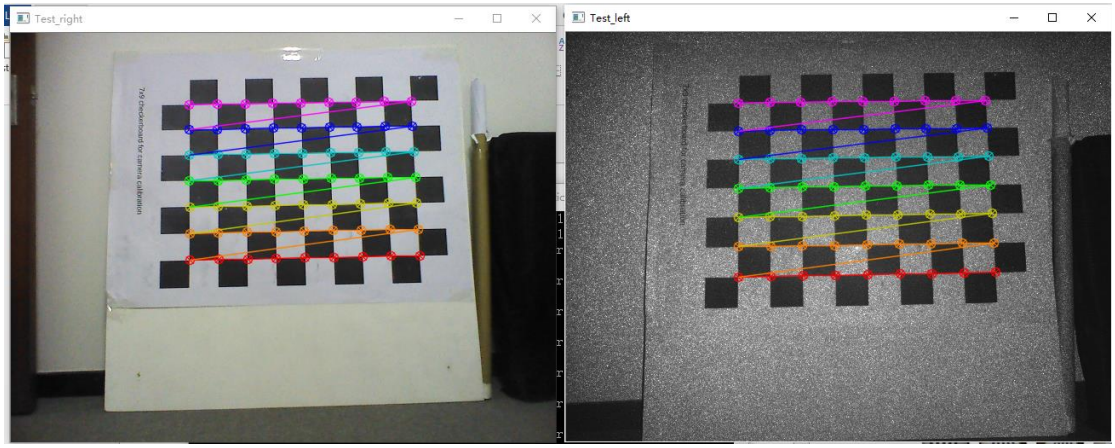
- **Set the distance between the plate and the camera to 2.0m, capture 4-6 pair of images.**
- **Set the distance between the plate and the camera to 2.4m, capture 4-6 pair**

of images.

Note 5: if you want to switch IR and RGB view, please press 'i'

Step 2. Calibration

- Press 'c' to start calibration
- Wait till the program output images as follow:



- Press 'space' to loop among the 15 image pairs to see if all the corresponding points are found;
- If 'de-correlation' is found on some image pairs. Capture one more pair of images to replace them.
- If all image pairs are good, you can find Intrinsic Parameters of IR and RGB as well as the rotation matrix in **StereoCalib\camera_params.ini**

Note 7: you only need to press 'c' for a single time. Extra press will initiate multiple calibration thread thus lower down your computer speed. You can exit the program and run it again. Saved images will remain valid.

Step 5. Use the result

If the Intrinsic Parameters are:

[Left Camera Intrinsic]

585.191	**0**	**316.568**
0	**543.456**	**257.15**
0	**0**	**1**

The sample code will be:

cam.left_camera_intrinsic_params << 585.191, 316.568, 543.456, 257.15;