# Kinect v2 intrinsic calibration

**Create temporary folder for storing calibration images:**

```
mkdir ~/tmp
```

**Launch Kinect sensor:**

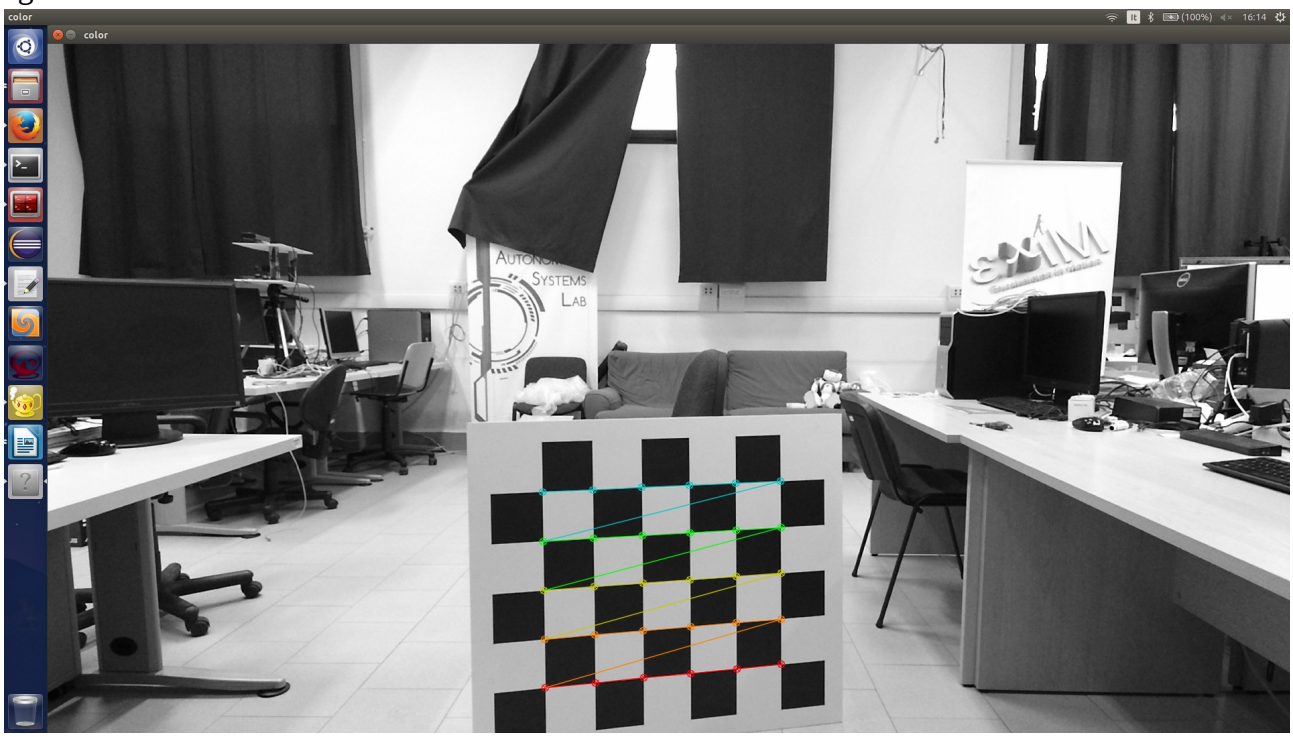
```
roslaunch kinect2_bridge kinect2_bridge.launch
```

**Calibrate color:**

1) Launch

```
rosrun kinect2_calibration kinect2_calibration record color
chess6x5x0.12 -color /kinect2_head/mono/image -ir
/kinect2_head/ir/image -interval 1 ~/tmp/
```

2) Move the checkerboard at different positions and distances from the sensor making sure that the checkerboard is correctly detected, that is some colored lines appear on the checkerboard as in the figure below.




When the checkerboard is detected, images are automatically saved every second to the destination folder (`~/tmp`).

**NB: be sure to insert the right checkerboard parameters in this string "chess6x5x0.12" when launching the executable. The first two numbers are the number of horizontal and vertical chess intersections, while the third number is the size of a square in meters. This is valid for all the operations described in this guide.**

3) Launch color calibration:

```
rosrun kinect2_calibration kinect2_calibration calibrate color
chess6x5x0.12 -color /kinect2_head/mono/image -ir
/kinect2_head/ir/image -interval 1 ~/tmp/
```

**Calibrate infrared image:**

1) Launch

```
rosrun kinect2_calibration kinect2_calibration record ir
chess6x5x0.12 -color /kinect2_head/mono/image -ir
/kinect2_head/ir/image -interval 1 ~/tmp/
```

2) Move the checkerboard at different positions and distances from the sensor making sure that the checkerboard is correctly detected, that is some colored lines appear on the checkerboard.
When the checkerboard is detected, images are automatically saved every second to the destination folder (`~/tmp`).

3) Launch IR calibration:

```
rosrun kinect2_calibration kinect2_calibration calibrate ir
chess6x5x0.12 -color /kinect2_head/mono/image -ir
/kinect2_head/ir/image -interval 1 ~/tmp/
```

**Calibrate pose between IR and color camera:**

1) Launch

```
rosrun kinect2_calibration kinect2_calibration record sync
chess6x5x0.12 -color /kinect2_head/mono/image -ir
/kinect2_head/ir/image -interval 1 ~/tmp/
```

2) Move the checkerboard at different positions and distances from the sensor making sure that the checkerboard is correctly detected **in both color and IR images**, that is in both images some colored lines appear on the checkerboard.
When the checkerboard is detected, images are automatically saved every second to the destination folder (`~/tmp`).

3) Launch color-ir pose calibration:

```
rosrun kinect2_calibration kinect2_calibration calibrate sync
chess6x5x0.12 -color /kinect2_head/mono/image -ir
/kinect2_head/ir/image -interval 1 ~/tmp/
```

**Move calibration data to the right folder:**

1) Create the folder that contains Kinect 2 calibration data

```
roscd kinect2_bridge
mkdir -p data/<serial>
```

where `<serial>` is the serial number of the Kinect 2 sensor. You can read it in the console output after launching the driver:

```
roslaunch kinect2_bridge kinect2_bridge.launch
```

At startup, you should see a line similar to this one:

```
[Freenect2Impl] found valid Kinect v2 @4:3 with serial
500258141742
```

2) Copy calibration results from the temporary folder to this folder:

```
cp ~/tmp/calib_color.yaml ~/tmp/calib_ir.yaml
~/tmp/calib_pose.yaml
~/workspace/ros/catkin/src/iai_kinect2/kinect2_bridge/data/<serial
>/
```

Now, when launching the Kinect driver, these calibration data are used.

To check the goodness of calibration, you can open Rviz
`rosrun rviz rviz`
and check if color data are correctly aligned with depth points, as in the figure below: