Monocular Camera installation and Calibration Tutorials

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This tutorials will simply record the process of calibrating the camera with ros. The PNT Lab uses equipments as follows:

Point Grey Blackfly BFLY-U3-23S6C-C camera
Kowa C-Mount 6mm f/1.8-16 1" HC Series Fixed Lens
Operating Systems:
Ubuntu 14.04 LTS , ROS jade

Installation

Camera Drivers-----Download from here (remember to choose your operating system):
https://www.ptgrey.com/Downloads/BySKU?family=Blackfly&sku=BFLY-U3-23S6C-C
Then you need to open the README file, and run these codes:
Ubuntu 14.04:
sudo apt-get install libraw1394-11 libgtkmm-2.4-1c2a libglademm-2.4-1c2a libgtkglextmm-x11-1.2-dev libgtkglextmm-x11-1.2 libusb-1.0-0 libglademm-2.4-dev
sudo sh install_flycapture.sh

Camera ROS Driver (you need to build a workspace, eg: camera_ros_driver/src/**your driver file**):
https://github.com/ros-drivers/pointgrey_camera_driver.git
To launch the camera, you need to add :
cd ~/camera_ros_driver
roslaunch pointgrey_camera_driver camera.launch
If an error 'Reconfigure callback filed with error: Pointgrey camera connect failed to get first……' occur, add follow codes:
sudo su
*source /opt/ros/jade/setup.bash(***optional***)*
source devel/setup.bash
roslaunch pointgrey_camera_driver camera.launch
Maybe there will be an error: process has died……, just try to use:
sudo sh -c 'echo 1000 > /sys/module/usbcore/parameters/usbfs_memory_mb'

Congratulate you have installed camera successfully, next step is to calibrate camera.

Calibration

Before follow the ROS Wiki tutorials , you need to run:
roslaunch pointgrey_camera_driver camera.launch
Recommend to reference 'How to Calibrate a Monocular Camera' - ROS Wiki,
http://wiki.ros.org/camera_calibration/Tutorials/MonocularCalibration

!!! Simply loading a calibration file does not rectify the image. For rectification, use the image_proc .
After calibration, make sure the camera is publishing topics /camera/image_raw and /camera/camera_info (rostopic list) , then you would do:

cd ~/camera_ros_driver
ROS_NAMESPACE=camera rosrun image_proc image_proc

In a separate terminal, add this:

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rosrun image_view image_view image:=camera/image_rect_color
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Then you can see an image window.