Kinect ROS driver

This guide demonstrates how to install the freenect driver for Kinect on Ubuntu 14.04. We can use this driver to record a dataset that can be utilised as input for the RGB-D SLAM algorithm. Also, I describe how to install the freenect driver on the Erle-Brain. However, there are still some issues with this process which I will illustrate later in this document.

Installation on Ubuntu 14.04

Installing the freenect ROS driver on Ubuntu is an easy process. Just install two packages:

- *sudo apt-get install libfreenect-dev*

- *sudo apt-get install ros-indigo-freenect-launch*

Installation on Erle-Brain

However, installing these drivers on the Erle-Brain is not as straightforward. The freenect launch package and its dependencies have to be installed in a different way, as I will explain below. The Erle-Brain 3 is a Raspberry Pi 3. Therefore I based the installation process for freenect on chapter 4.2 at http://wiki.ros.org/ROSberryPi/Installing ROS Kinetic on the Raspberry Pi

- First power the Erle-Copter and connect your laptop to the erlerobotics WiFi. Make sure that the Erle-Copter has an internet connection via its ethernet port.

- Connect to the Erle-Copter via SSH. In the folder '/*Tech report/Code/Shell scripts'* in this portfolio, I included the **erle_ssh.sh** script that does this. The login for the Erle-Copter is '*erle'*, and the password is *'holaerle'*.

- Before installing the freenect package itself, all required dependencies have to be installed. For this purpose, generated rosinstall files. This is done by executing:
  rosinstall generator <package> --rosdistro kinetic --deps –wet-only --tar > <package>.rosinstall
  where "package" is the dependency that has to be installed. The freenect_launch package and its recursive dependencies for which I generated rosinstall files are listed below:
  - freenect_launch
  - rgbd_launch
  - smclib *(dependency of 'bond')*
  - bond *(dependency of 'nodelet')*
  - bondcpp *(dependency of 'nodelet')*
  - nodelet
  - image_proc
  - libfreenect
  - freenect_camera
  For example, to create a rosinstall file for **nodelet**, go to the catkin workspace and execute:
  rosinstall generator nodelet --rosdistro kinetic --deps –wet-only --tar > nodelet.rosinstall

- Then, the **src** folder in the catkin workspace has te be initialised for rosinstall files:
  wstool init src

- In order to import the rosinstall files in the **src** folder, execute the commond below for every

rosinstall:

> ***wstool merge -t src <package>***

- When this is done, the **src** folder has to be updated:
  > ***wstool update -t src***

  If this command renders errors, just try to execute it again.

- Now, the catkin workspace can be built. Execute the command below for every package, in the order listed above.
  > ***catkin_make_isolated --pkg <package> --install***

  If the libfreenect package can not be built, try to execute
  > ***sudo apt-get install libxmu-dev libxi-dev***

This is where my dependency problems started. When trying to launch the freenect driver on the Erle-Copter (using ***roslaunch freenect_launch freenect.launch***), I get a lot of errors about the **depth_image_proc** package which we did not include in the rosinstalls. Building this package by using the method above is not possible, as it requires computational resources that the Erle-Brain can not provide. Therefore, the **depth_image_proc** package has to be cross-compiled for ARM on your laptop and then copied to the Erle-Brain via SCP.

I did not manage succesfully finish the cross-compilation of **depth_image_proc.** As a result, datasets for RGB-D SLAM can not be recorded via the Erle-Brain. For now, I use the freenect driver on my laptop.