Appendix A

How to make working Microsoft Kinect XBOX 360 from scratch

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This appendix tries to make your life easier when trying to set up the Kinect on your laptop. It took me for a while to make it work and I think it is interesting to share my experience with you. In that case, I am using the following configuration:

- Sony Vaio VPCEB1M1E

- Processor Intel®Core i3.

- Graphics card ATI Mobility Radeon$^{\text{TM}}$HD 5650.

- Ubuntu 10.10 (64 bits).

- QtCreator as IDE.

- Usage of the following libraries: OpenCV, PCL, OpenNI.

If you want to use another configuration, you might need to find the way to modify the guideline provided hereafter. You might need to type some of the commands by your own due to the Latex characters.

1. Download *Ubuntu 10.10 Desktop for 64 bits* from
   http://releases.ubuntu.com/10.10/.

2. Install it in a flash drive (if you are in Windows you can do so using *Universal USB-Installer*).

3. Reboot your laptop after plugging your flash drive into a USB port. Your previously installed Ubuntu installer from your flash drive will start running. Follow the instructions to install it properly (you can find a lot of tutorials online to help you on that). I made 4 different partitions. One for (/home,/, /boot and /swap).

4. Once the installation is done, reboot and run your Ubuntu 10.10.

5. You might need to install some programs to set up your Ubuntu:

   (a) `sudo apt-get install aptitude`

   (b) `sudo apt-get install git`

   (c) `sudo apt-get install g++`

   (d) Install *Java7* using the following tutorial (section Java 7 , Sun/Oracle)
       `http://brunoreis.com/tech/intalling-java-ubuntu-natty/`

6. Go to Ubuntu Software Center and install `QtCreator4`.

7. Installation of *OpenCV* (`http://opencv.willowgarage.com/wiki/`):

   (a) `sudo apt-get install build-essential libgtk2.0-dev`
       `libjpeg62-dev libtiff4-dev libjasper-dev libopenexr-dev`
       `cmake python-dev python-numpy libtbb-dev libeigen2-dev`
       `yasm libfaac-dev libopencore-amrnb-dev libopencore-amrwb-dev`
       `libtheora-dev libvorbis-dev libxvidcore-dev`

   (b) `wget http://ffmpeg.org/releases/ffmpeg-0.7-rc1.tar.gz`

   (c) `tar -xvzf ffmpeg-0.7-rc1.tar.gz`

   (d) `cd ffmpeg-0.7-rc1`

   (e) `./configure --enable-gpl --enable-version3`
       `--enable-nonfree --enable-postproc --enable-libfaac`
       `--enable-libopencore-amrnb --enable-libopencore-amrwb`
       `--enable-libtheora --enable-libvorbis --enable-libxvid`
       `--enable-x11grab --enable-swscale --enable-shared`

   (f) `make`

   (g) `sudo make install`

   (h) `cd ~`

(i) `wget downloads.sourceforge.net/project/opencvlibrary/ opencv-unix/2.3.1/OpenCV-2.3.1a.tar.bz2`

(j) `tar -xvf OpenCV-2.3.1a.tar.bz2`

(k) `cd OpenCV-2.3.1/`

(l) `mkdir build`

(m) `cd build`

(n) `cmake -D WITH_EIGEN=ON -D WITH_TBB=ON -D BUILD_NEW_PYTHON_SUPPORT=ON -D WITH_V4L=OFF -D INSTALL_C_EXAMPLES=ON -D INSTALL_PYTHON_EXAMPLES=ON -D WITH_OPENNI=ON -D BUILD_EXAMPLES=ON ..`

(o) `make -j4`

(p) `sudo make install`

8. Installation of *Point Cloud Library* (http://www.pointclouds.org/downloads/linux.html):

    (a) `sudo add-apt-repository ppa:v-launchpad-jochen-sprickerhof-de/pcl`

    (b) `sudo apt-get update`

    (c) `sudo apt-get install libpcl-all`

9. Installation of *Kinect* (*OpenNI*, *NITE* and *AVIN2*) (http://igorbarbosa.com/articles/how-to-install-kin-in-linux-mint-12-ubuntu/):

    (a) `sudo apt-get install libusb-1.0-0-dev freeglut3-dev`

    (b) `cd ~`

    (c) `mkdir kinect`

    (d) Download *OpenNI stable build for Ubuntu 10.10 v1.5.2.23* from http://www.openni.org/Downloads/OpenNIModules.aspx

    (e) Download *PrimeSense NITE stable build for Ubuntu 10.10 v1.5.2.21* from http://www.openni.org/Downloads/OpenNIModules.aspx

    (f) Download *PrimeSense NITE stable build for Ubuntu 10.10 v1.5.2.21* from https://github.com/avin2/SensorKinect/zipball/unstable

    (g) Extract and rename the downloaded folders. Rename the OpenNI folder as 'openni', the Nite folder as 'nite' and the Avin2 folder as 'sensorkin'. Add the 3 folders into the previously created kinect folder from your home.

(h) Installation of OpenNI:

    i. `cd ∼/kinect/openni/`

    ii. `chmod a+x install.sh`

    iii. `sudo ./install.sh`

(i) Installation of AVIN2:

    i. `cd ∼/kinect/sensorkin/Platform/Linux/CreateRedist/`

    ii. `chmod a+x RedistMaker`

    iii. `sudo ./RedistMaker`

    iv. `cd ../Redist/Sensor-Bin-Linux-x64-v5.1.0.2`

    v. `sudo chmod a+x install.sh`

    vi. `sudo ./install.sh`

(j) Installation of NITE:
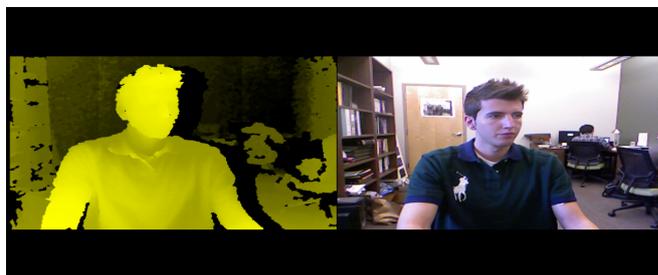
    i. `cd ∼/kinect/nite/`

    ii. `chmod a+x install.sh`

    iii. `sudo ./install.sh`

10. At this point, you must be able to run your Kinect. Plug your device into a USB port and run the following test:

    (a) `cd ∼/kinect/openni/Samples/Bin/x64-Release/`

    (b) `./Sample-NiUserTracker`

    (c) You can also run the NiViewer by typing `./NiViewer`

    (d) You should get something similar as what it is shown in Figures A.1(a) and A.1(b).
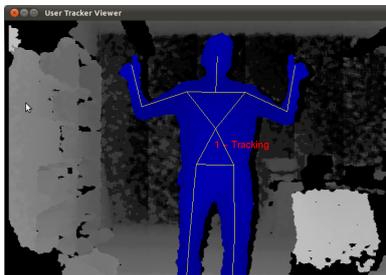
(a) ./Sample-NiUserTracker   **(b)** ./NiViewer

Figure A.1: Demo's output