Kinect Based Module Development

E-Yantra Summer Internship Program

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Chapter 1

Installation of necessary software

1.1 Installation of Kinect for Windows SDK (Windows)

Hello world ! This is a quick installation tutorial for the Microsoft's Kinect for Windows SDK. The Kinect for Windows Software Development Kit (SDK) enables developers to create applications that support gestures and voice recognition, using kinect sensor technology.

Note : At the time of making of this manual, the latest version was Kinect for windows v.1.8.0 The same was used for experimenting with kinect.

1.1.1 System Requirements

- Hardware Requirements
  - 32-bit (x86) or 64-bit (x64) processor
  - Dual-core 2.66-GHz or faster processor
  - Dedicated USB 2.0 bus
  - 2 GB RAM
  - A Microsoft Kinect for Windows (or Xbox) sensor
- Software Requirements
  - Visual Studio 2010, or Visual Studio 2012. The free Express editions can be downloaded from Microsoft Visual Studio 2010 Express or Microsoft Visual Studio 2012 Express.
  - .NET Framework 4 (installed with Visual Studio 2010), or .NET Framwork 4.5 (installed with Visual Studio 2012)
  - To develop speech-enabled Kinect for Windows Applications, you must install the Microsoft Speech Platform SDK v11

1.1.2 Installation Procedure

Step 1 :

First the Microsoft's Kinect for windows SDK has to be downloaded. This is available free of cost at the Microsoft Website. Download the same. Visit
http://www.microsoft.com/en-in/download/details.aspx?id=40278. Shown in figure 1.1.

Step 2 :

Double click on the **KinectSDK-v1.8-Setup.exe** from the download location to begin the installation. Accept the terms and conditions and click install. Shown in figure 1.2 and figure 1.3 respectively.

Step 3 :

The installation procedure will complete on its own. Shown in figure 1.4

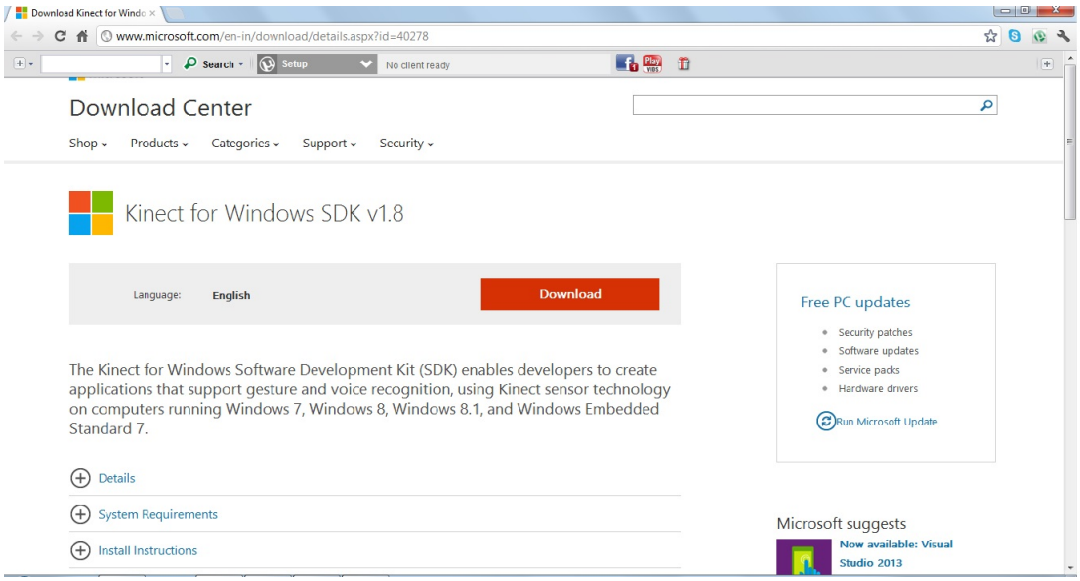

Figure 1.1: Step 1 - Microsoft's Kinect for Windows SDK website

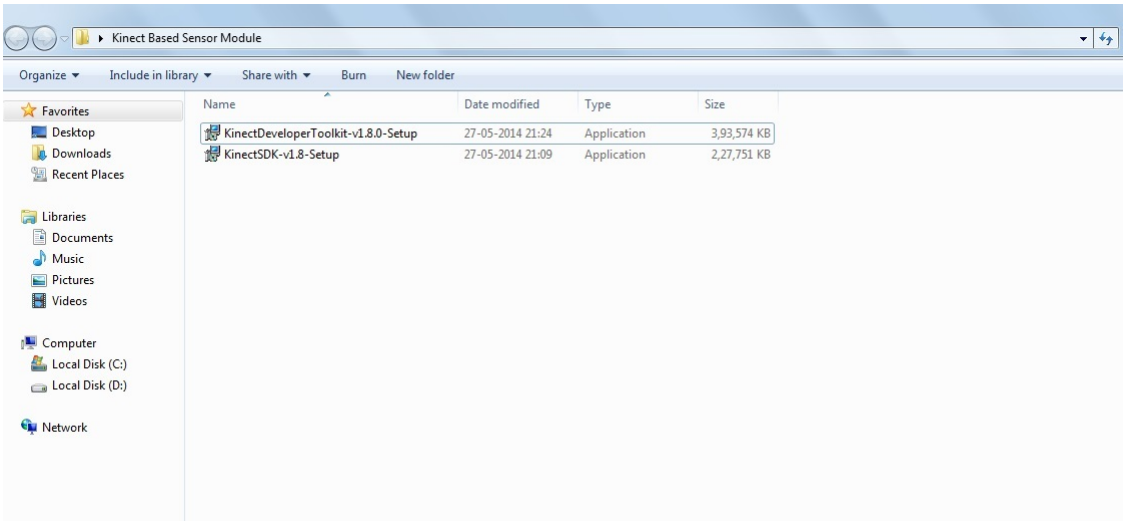

Figure 1.2: Step 2 - The downloaded setup files

Step 4 :

After the installation of the SDK, download the Microsoft's Kinect for windows toolkit from the link in the window. Shown in figure 1.5

Step 5 :

Double click on the **KinectDeveloperToolkit-v1.8.0-Setup.exe** from the download location to begin the installation. Accept the terms and conditions and click install. Shown in figure 1.6

Step 6 :

The installation procedure will complete on its own. Shown in figure 1.7

Step 7 :

Wait for the installation to complete. Shown in figure 1.8

Step 8 :

Verify the installation by opening the Developer Toolkit Browser v.1.8.0 Shown in figure 1.9

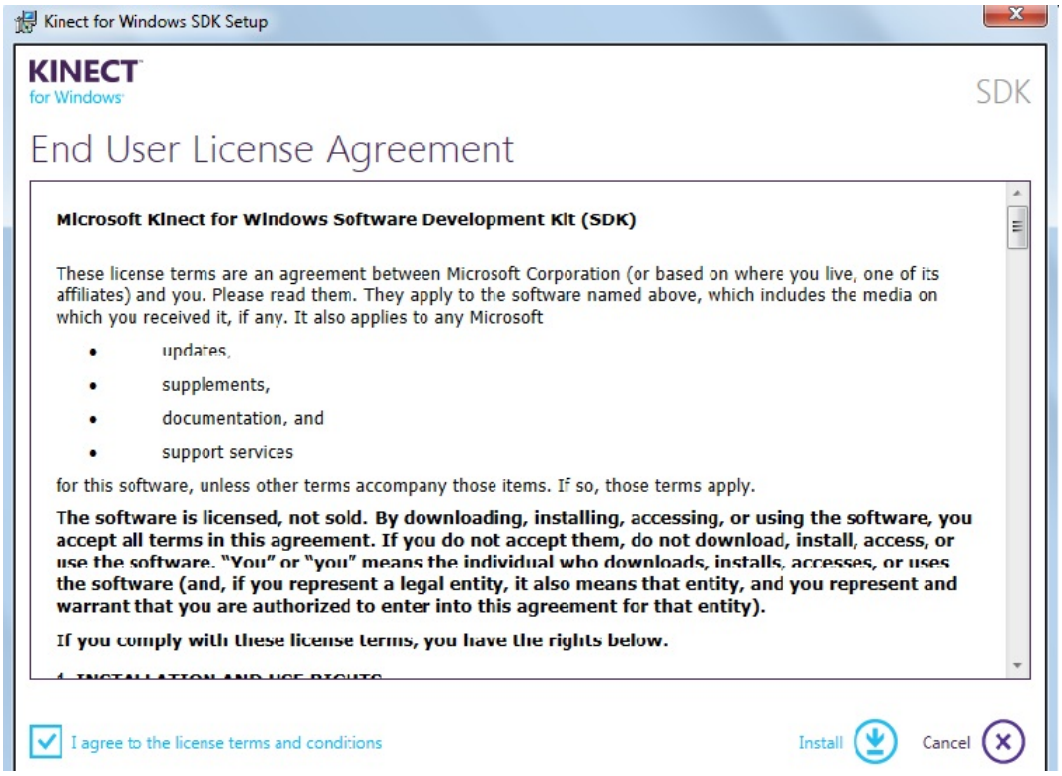

Figure 1.3: Step 2 - Kinect for windows SDK setup

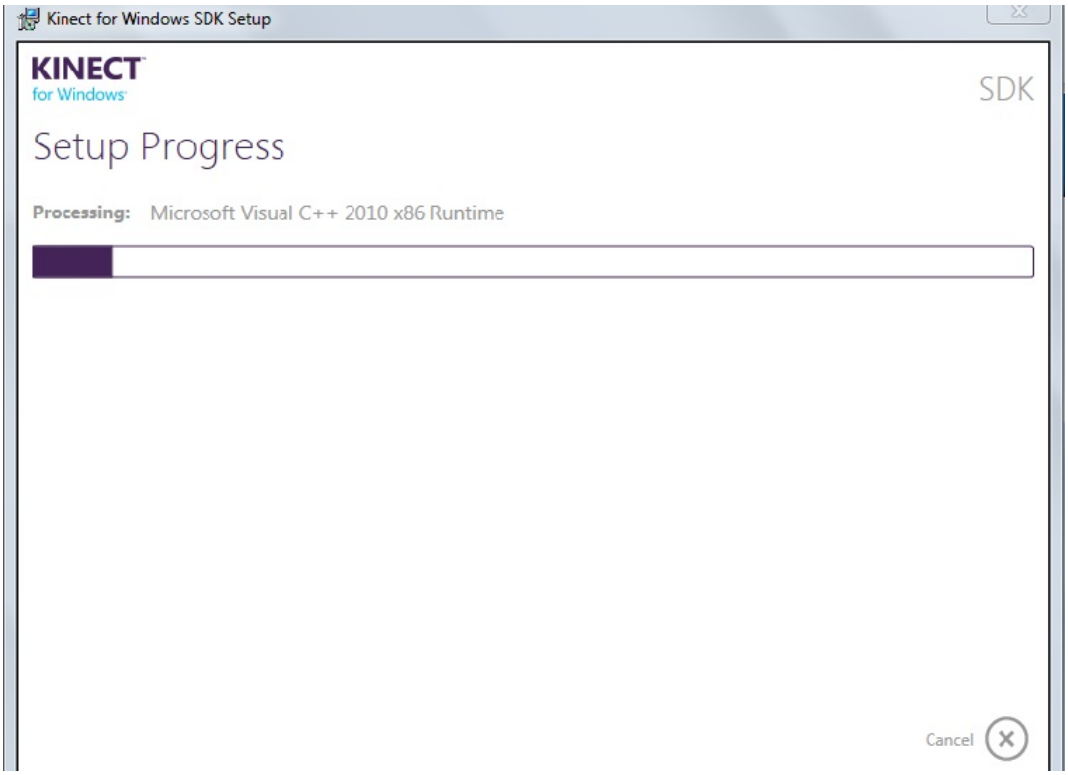

Figure 1.4: Step 3 - Setup process will complete on its own

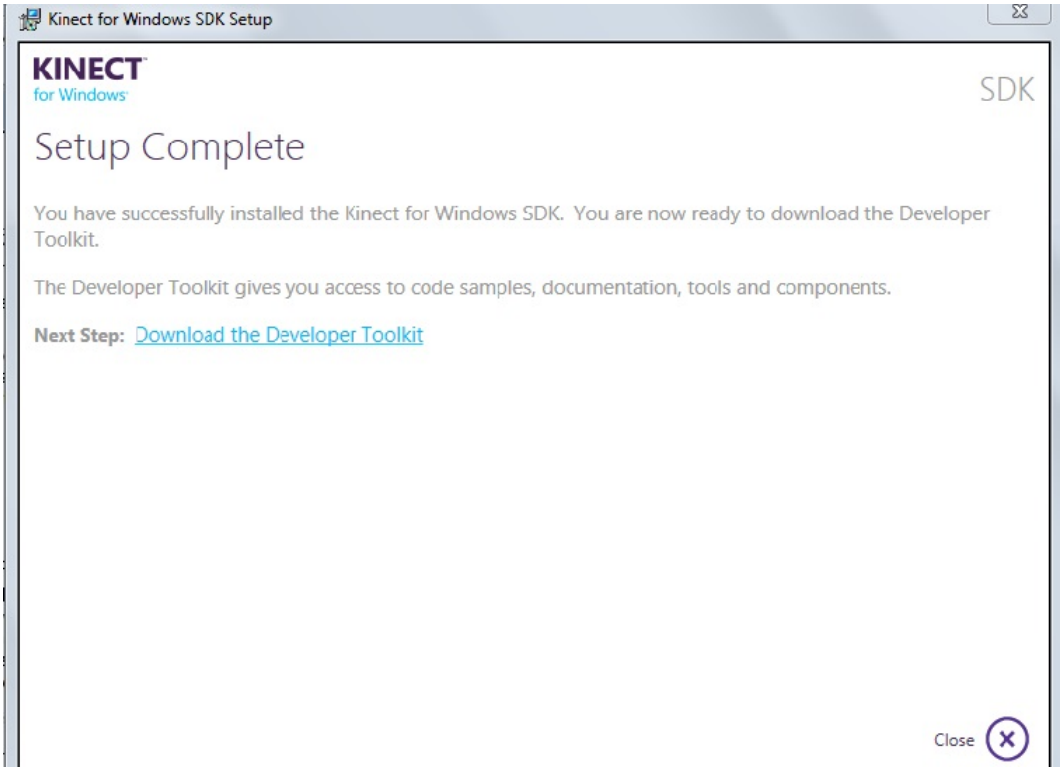

Figure 1.5: Step 4 - Click on "Download the developer toolkit"

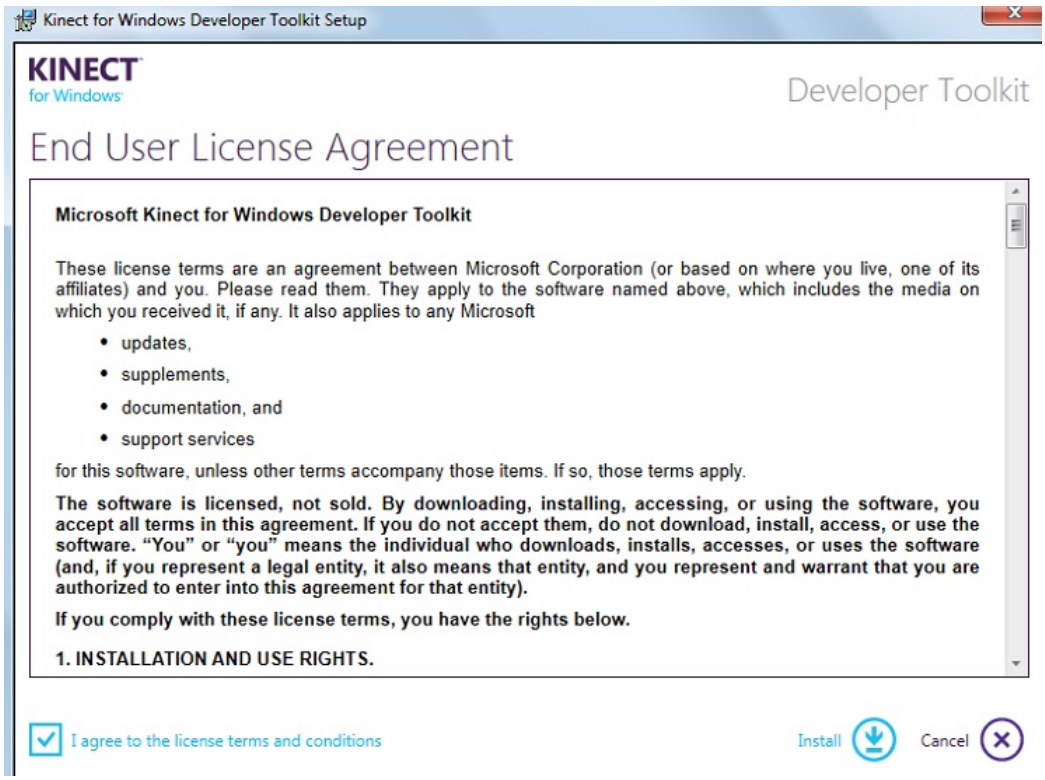

Figure 1.6: Step 5 - Kinect for Windows Developer toolkit setup

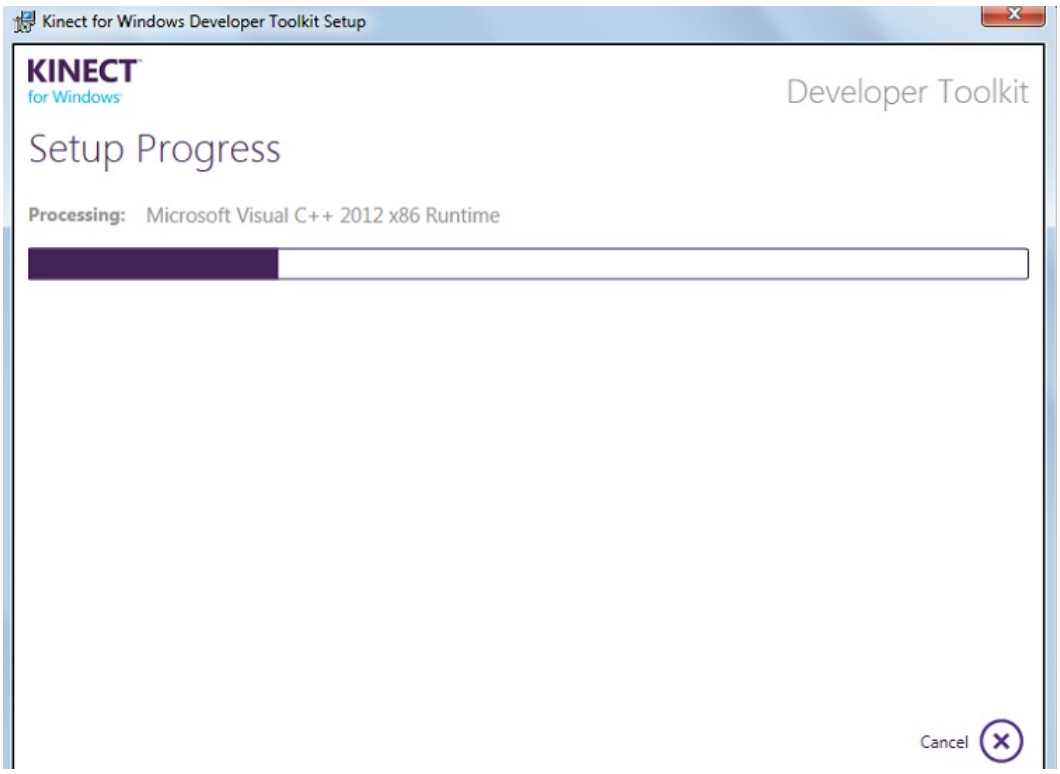

Figure 1.7: Step 6 - The toolkit setup will complete on its own

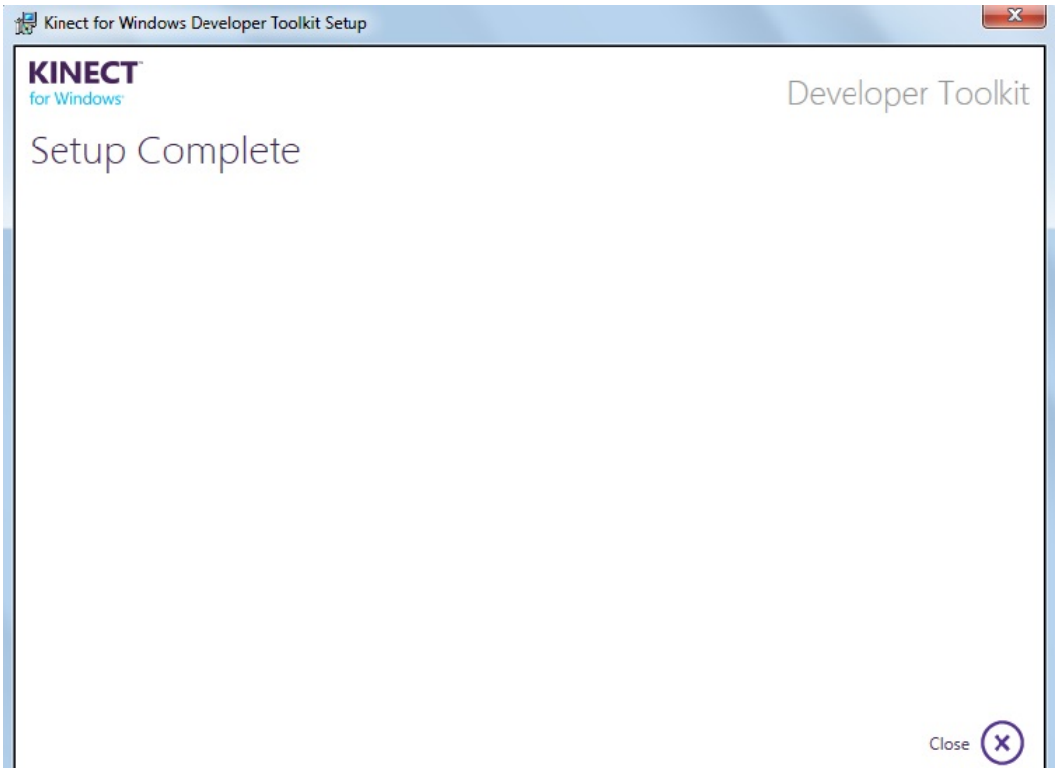

Figure 1.8: Step 7 - The setup is complete

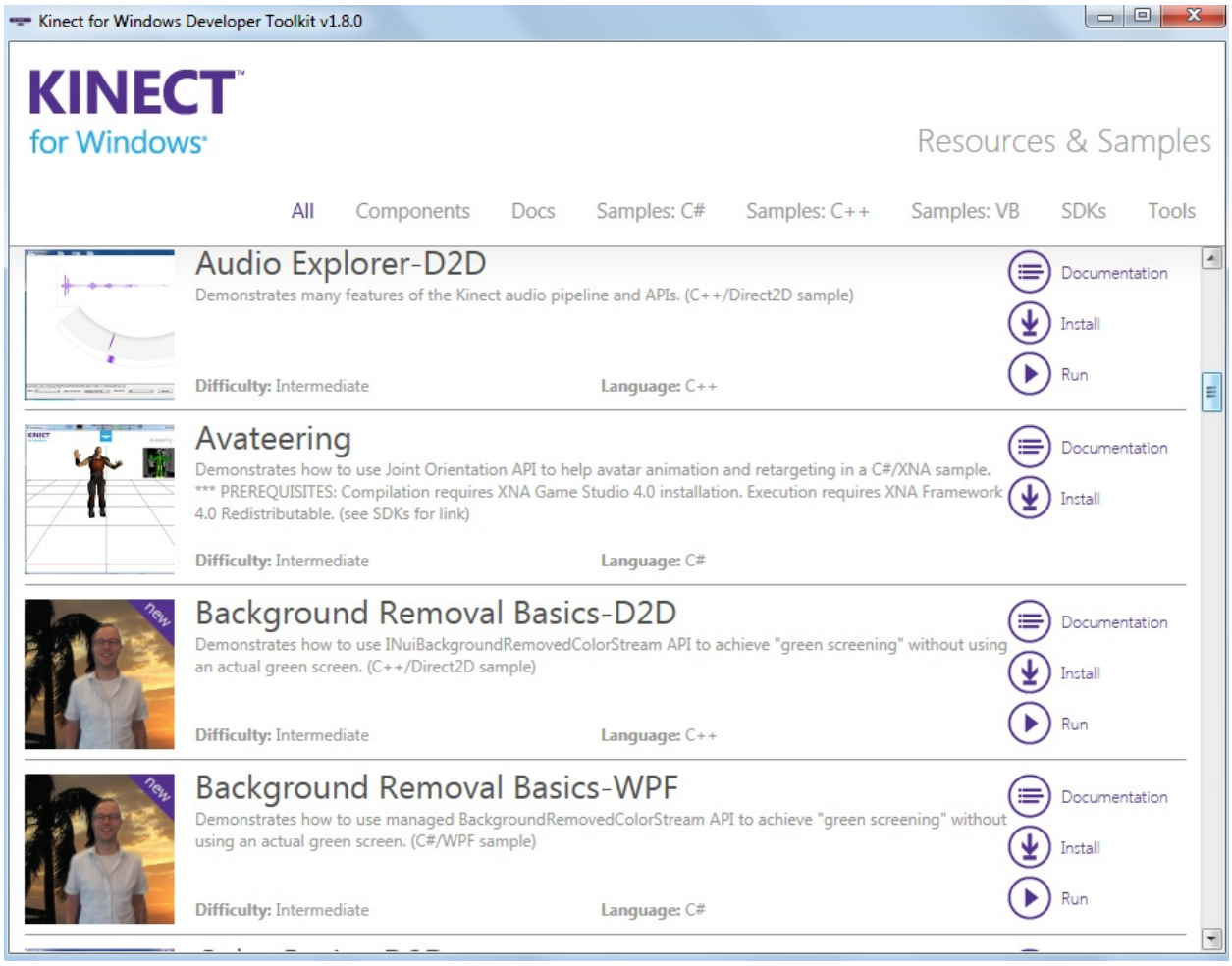

Figure 1.9: Step 8 - Kinect for windows Developer Toolkit v1.8.0

1.2 Installation of Openkinect's Libfreenect (Ubuntu)

Hello world ! This is a quick installation tutorial for the Openkinect's Libfreenect on the Linux platform. Ubuntu 14.04 is the platform used in this tutorial.

1.2.1 System Requirements

- Hardware Requirements
  - 32-bit (x86) or 64-bit (x64) processor
  - Dual-core 2.66-GHz or faster processor
  - Dedicated USB 2.0 bus
  - 2 GB RAM
  - A Microsoft Kinect for Windows (or Xbox) sensor

1.2.2 Installation Procedure

Step 1 :

Open a new terminal and type -

sudo apt-get install git-core cmake libglut3-dev pkg-config build-essential libxmu-dev libxi-dev libusb-1.0-0-dev
Enter the password when prompted. The installation will complete on its own.

Note: If you getting an error saying apt-get cannot find libglut3, you might be on a newer version of Ubuntu that has freeglut3-* instead of libglut3-*, so your initial apt-get install would look like:

sudo apt-get install git-core cmake freeglut3-dev pkg-config build-essential libxmu-dev libxi-dev libusb-1.0-0-devgit

Shown in figure 1.10

Step 2 :

Clone the Libfreenect file from Github base by typing

clone git://github.com/OpenKinect/libfreenect.git

At the completion of cloning you will find a folder named **libfreenect** in your home directory.

Shown in figure 1.11

Step 3 :

Enter the libfreenect folder by typing -

cd libfreenect

Shown in figure 1.12

Step 4 :

Make a new directory in the libfreenect folder and name it 'build'

mkdir build

Shown in figure 1.13

Step 5 :

Enter the build directory by typing -

cd build

Shown in figure 1.14

Step 6 :

Now "make" all the projects by typing -

cmake ..

and then type

make

Shown in figure 1.15 and figure 1.16 respectively

Step 7 :

Next Type -

sudo make install

Shown in figure 1.17

Step 8 :

Configure all the libraries by typing -

sudo ldconfig /usr/local/lib64/

Shown in figure 1.18

Step 9 :

To use Kinect as a non-root user type the following -

sudo adduser $USER video

Shown in figure 1.19

Step 10 :

Now for testing the installed software we will run one of the sample projects by typing -

sudo freenect-glview

Shown in figure 1.20 and figure 1.21

Note :

- The installation procedure for other platforms is available on

  http://openkinect.org/wiki/Getting_Started

- One can also make a file with rules for the Linux device manager:

  sudo nano /etc/udev/rules.d/51-kinect.rules

  Copy and paste:

  # ATTRproduct==”Xbox NUI Motor” SUBSYSTEM==”usb”, ATTRidVendor==”045e”, ATTRidProduct==”02b0”, MODE=”0666” # ATTRproduct==”Xbox NUI Audio” SUBSYSTEM==”usb”, ATTRidVendor==”045e”, ATTRidProduct==”02ad”, MODE=”0666” # ATTRproduct==”Xbox NUI Camera” SUBSYSTEM==”usb”, ATTRidVendor==”045e”, ATTRidProduct==”02ae”, MODE=”0666” # ATTRproduct==”Xbox NUI Motor” SUBSYSTEM==”usb”, ATTRidVendor==”045e”, ATTRidProduct==”02c2”, MODE=”0666” # ATTRproduct==”Xbox NUI Motor” SUBSYSTEM==”usb”, ATTRidVendor==”045e”, ATTRidProduct==”02be”, MODE=”0666” # ATTRproduct==”Xbox NUI Motor” SUBSYSTEM==”usb”, ATTRidVendor==”045e”, ATTRidProduct==”02bf”, MODE=”0666”

  Be sure to log out and back in.

Congratulations ! You have just installed the necessary software for your platform to work on the Kinect sensor.

Figure 1.10: Step 1 - Installation

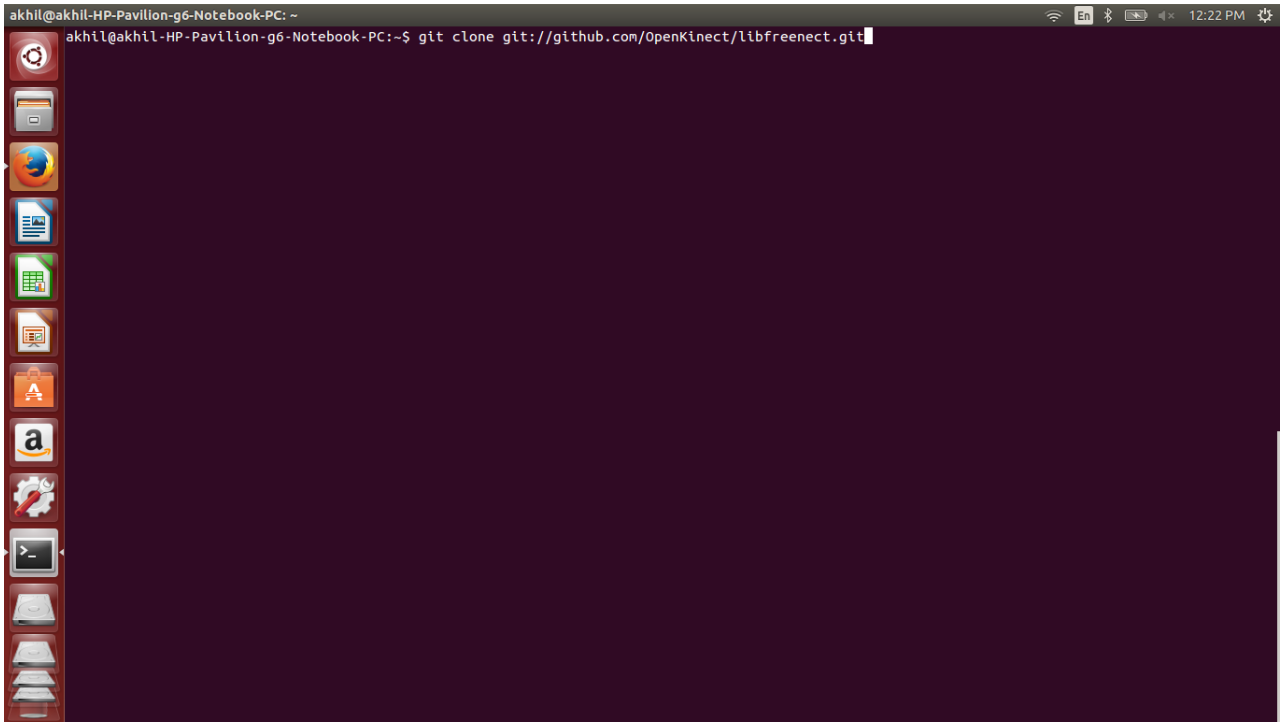

Figure 1.11: Step 2 - Cloning libfreenect

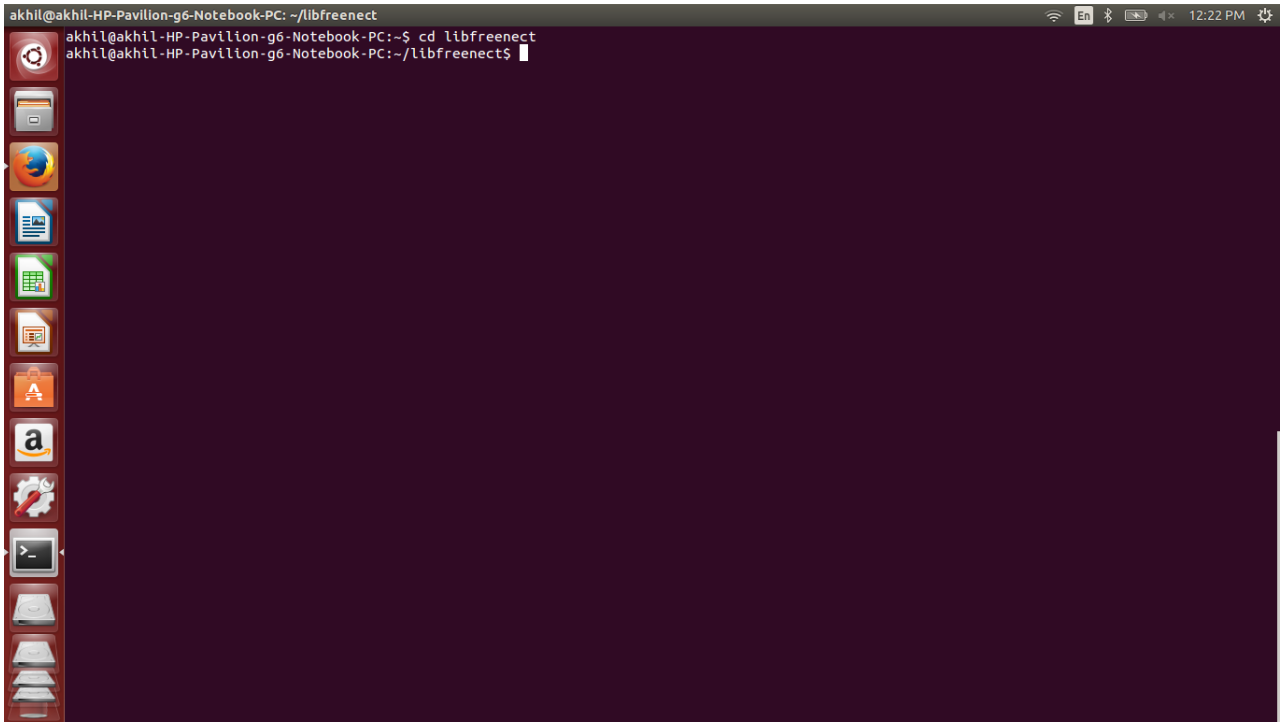

Figure 1.12: Step 3 - Enter the libfreenect folder

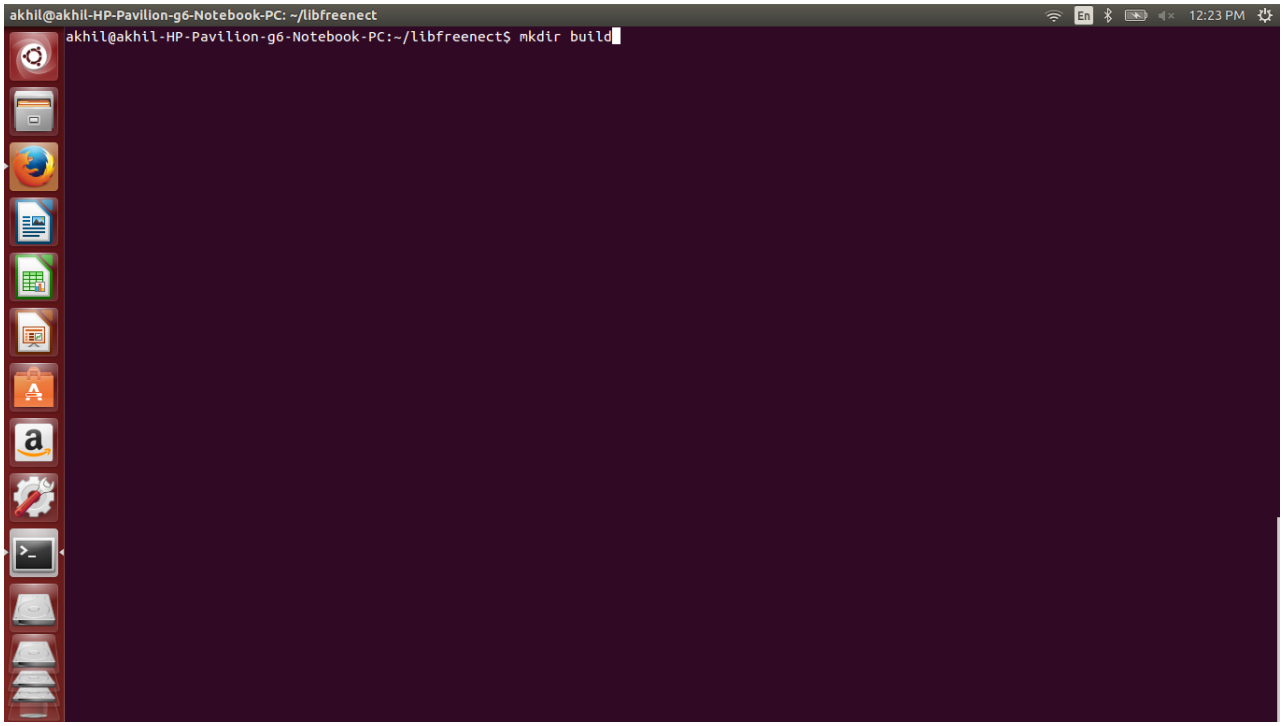

Figure 1.13: Step 4 - Create a new directory named "build"

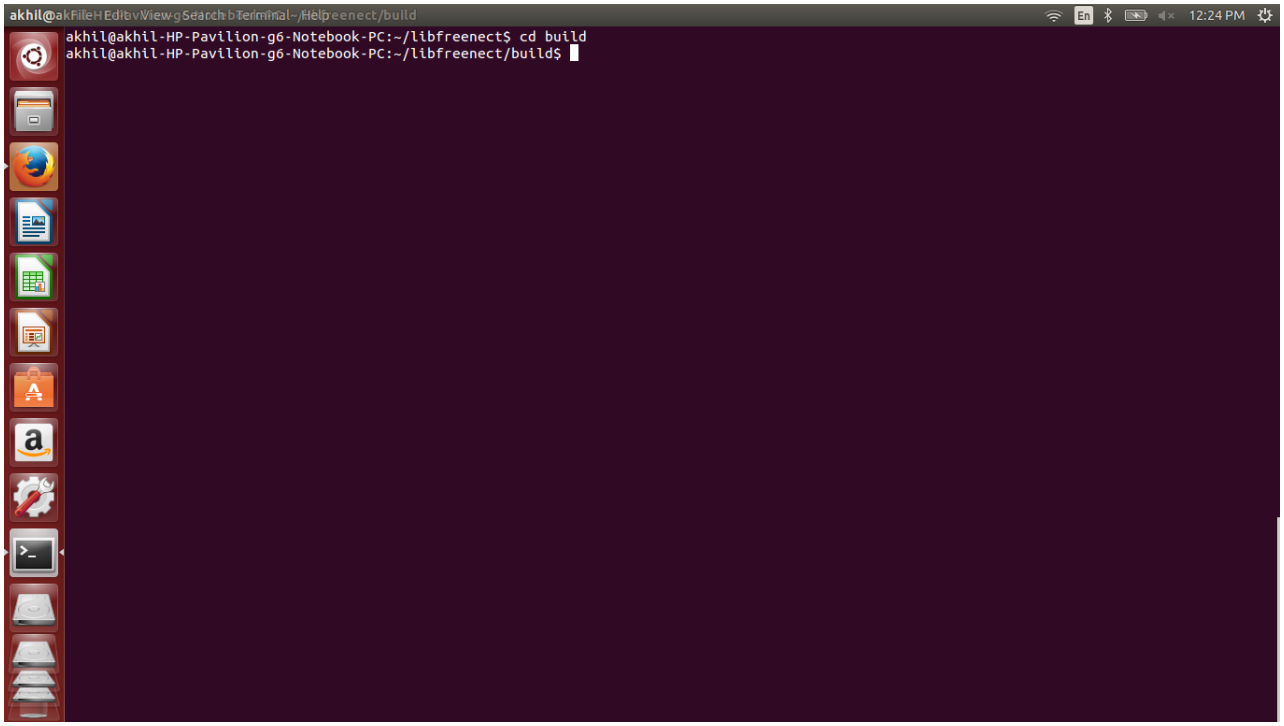

Figure 1.14: Step 5 - Enter the build directory

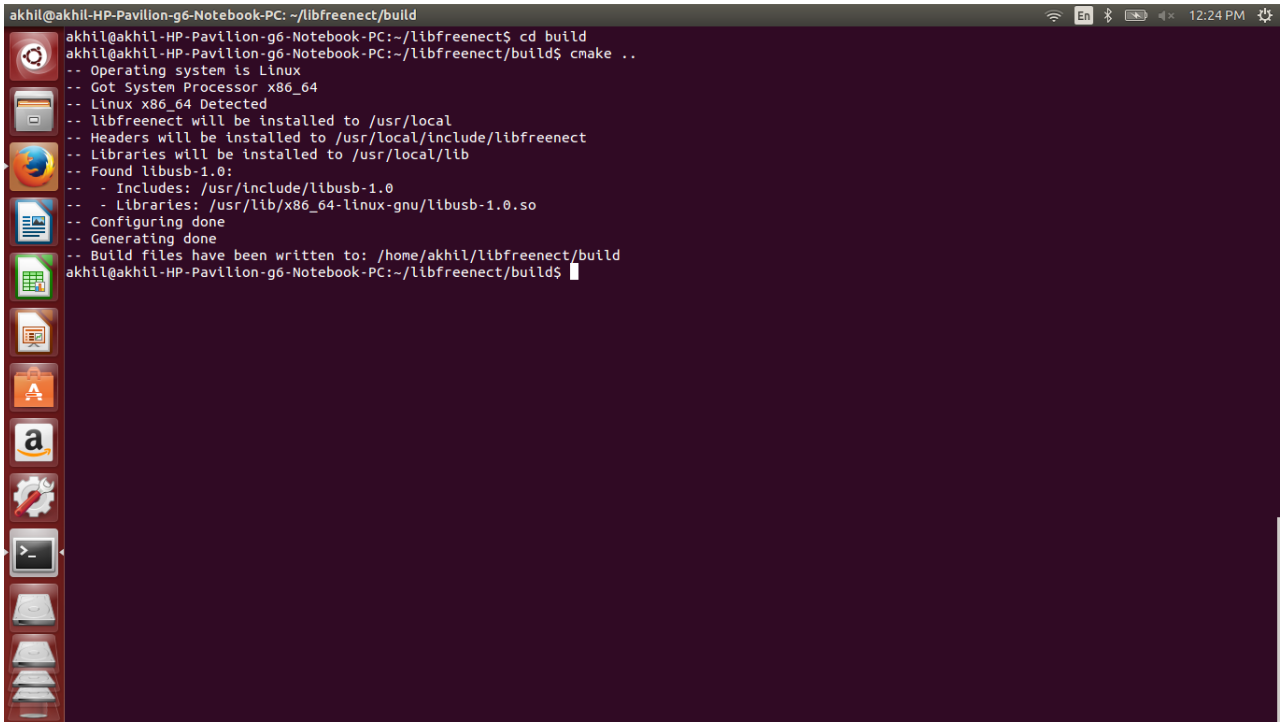

Figure 1.15: Step 6 - cmake ..

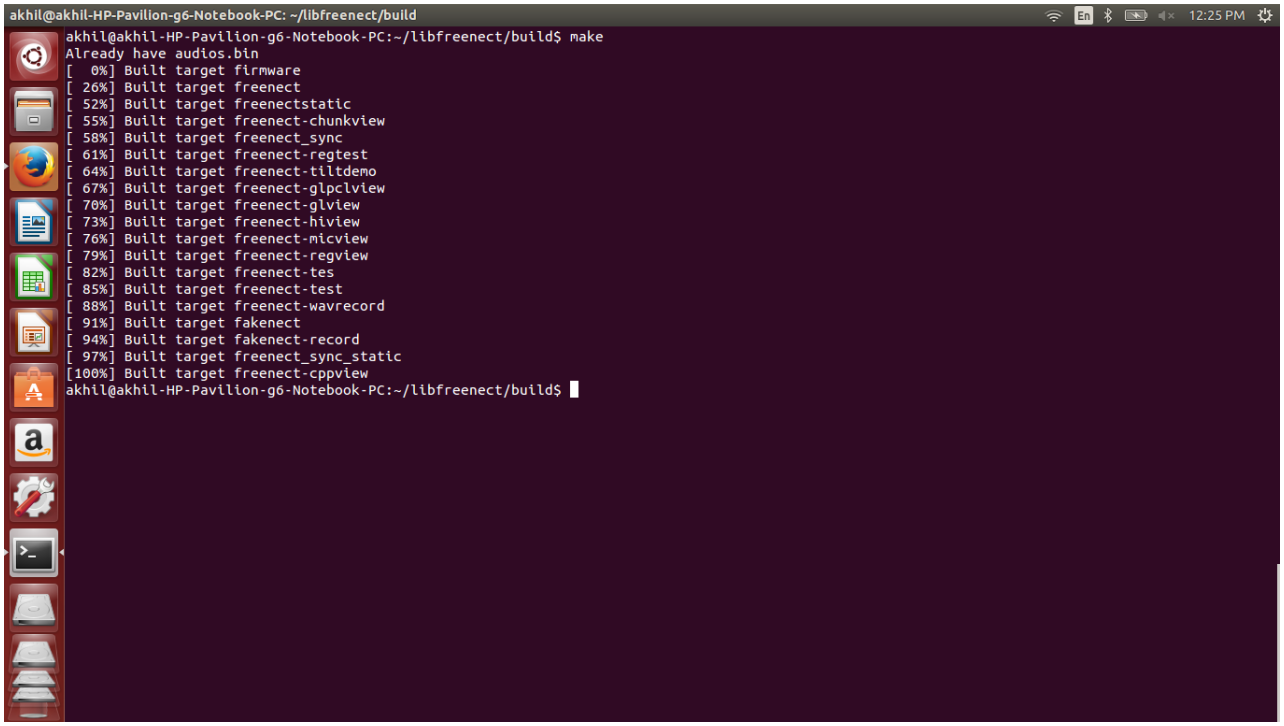

Figure 1.16: Step 6 - make

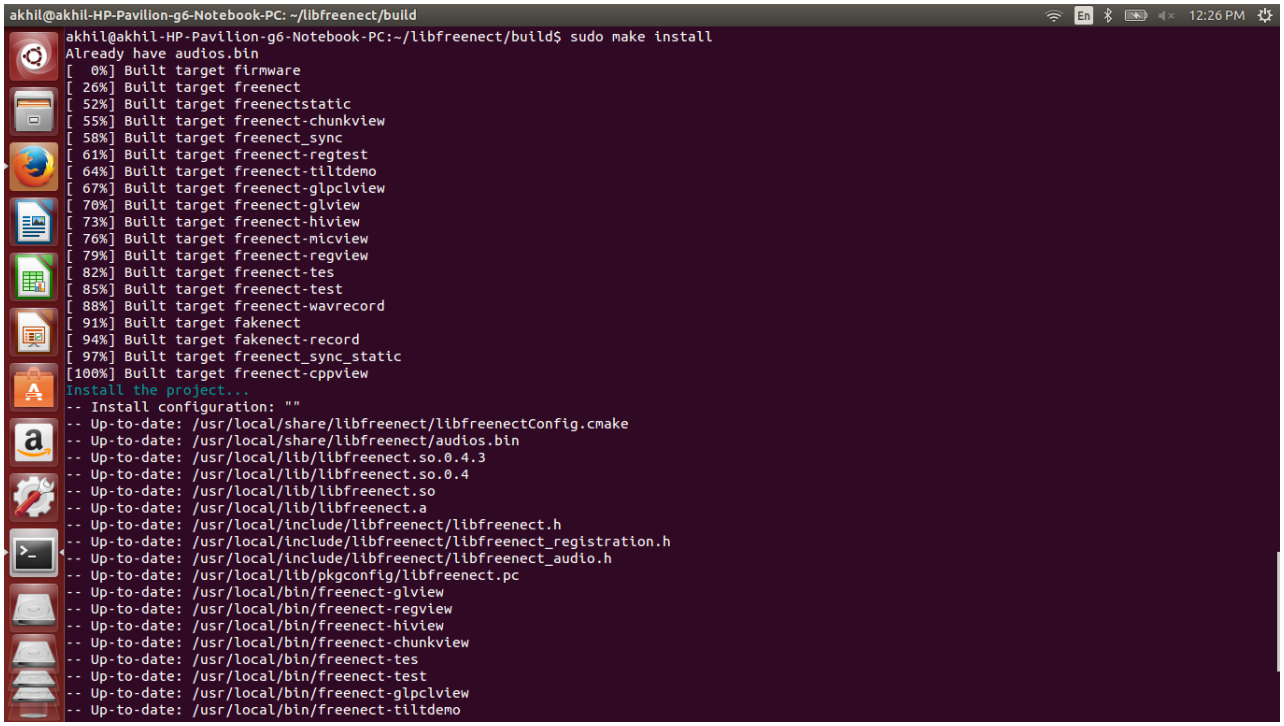

Figure 1.17: Step 7 - sudo make install

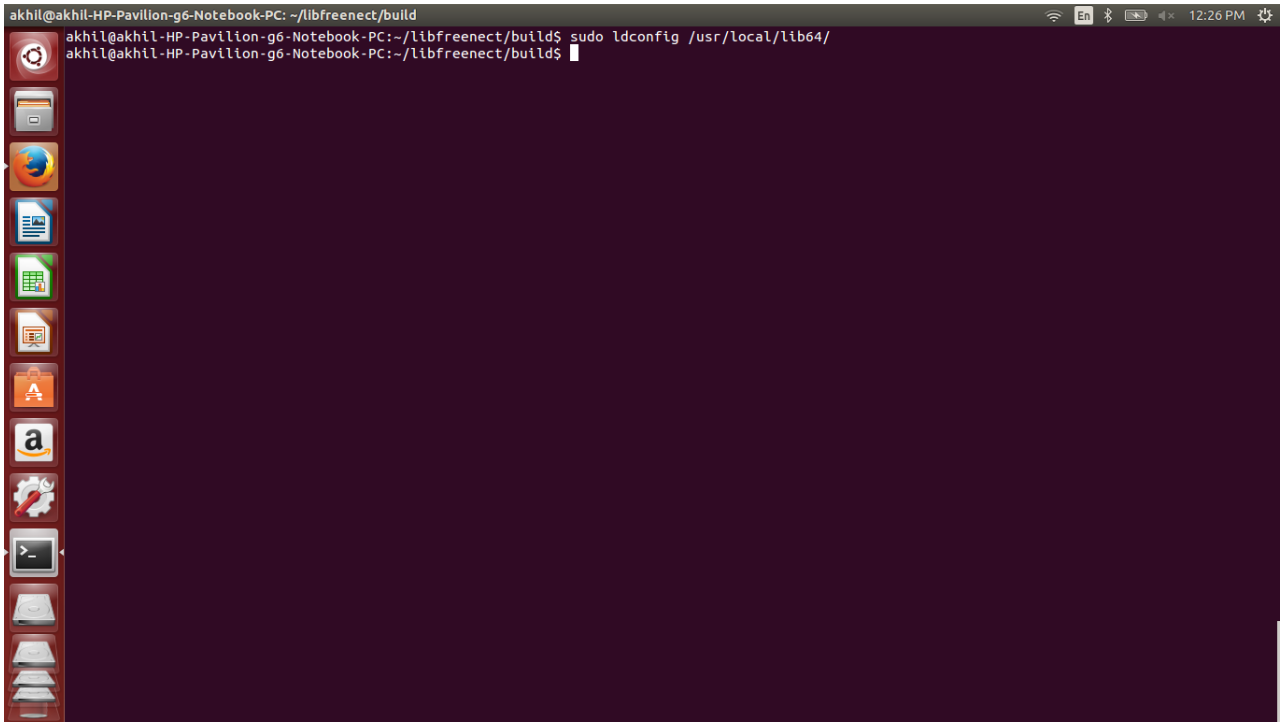

Figure 1.18: Step 8 - Configuring the libraries

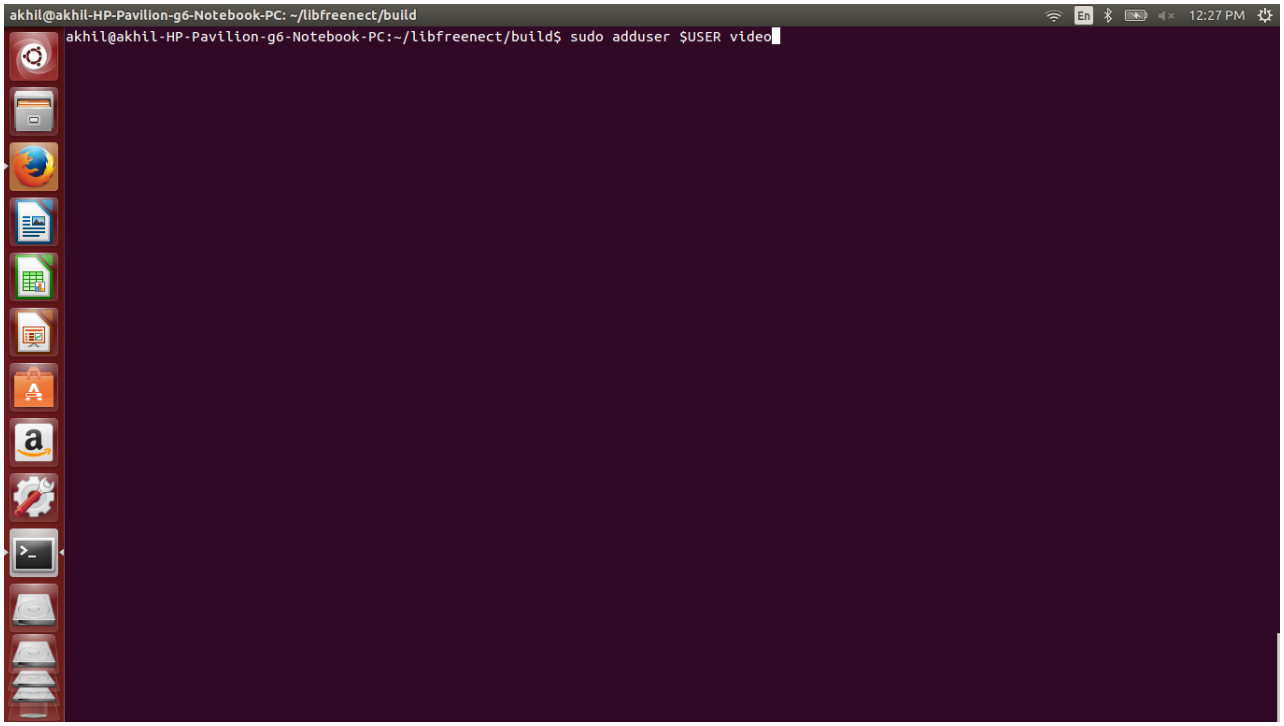

Figure 1.19: Step 9 - To use kinect as a non-root user

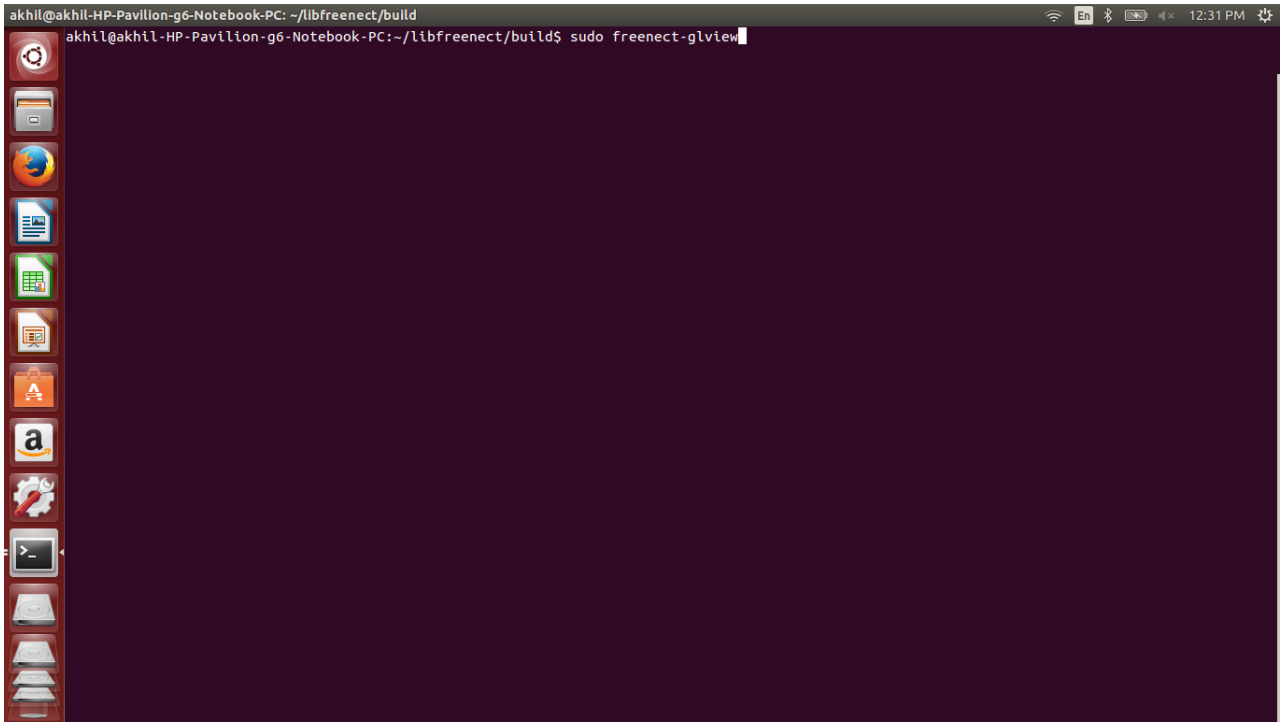

Figure 1.20: Step 10 - Run a sample project

Figure 1.21: Step 10 - Depth Image and Live Stream Video