Tara Stereo Vision USB 3.0 Camera

Building SDK Solutions: Linux

e-con Systems

Your Product Development Partner

Version 1.4

e-con Systems

7/16/2018

Disclaimer

e-con Systems reserves the right to edit/modify this document without any prior intimation of whatsoever.

© Copyright e-con Systems. 2017. All rights reserved.

Contents

Introduction to Tara SDK Package

The Tara Software Development Kit (SDK) package, built on OpenCV Image Processing Library (version 3.4.1) is bundled with Tara - Stereo Vision USB 3.0 Camera. Tara SDK has the commonly used stereo camera functions such as disparity, depth measurement, and few real time applications implemented in OpenCV, and is provided with the source code.

This document helps in building and installing the samples given in the Linux SDK package.

Prerequisites

The prerequisites are as follows:

- 4GB Memory space in Hard Disk
- Internet connectivity
- Cmake version should be greater than 2.8.7

© Copyright e-con Systems. 2017. All rights reserved.

By default, the release package is provided with prebuilds that will work on 64-bit version of Ubuntu-16.04. So, Ubuntu-16.04 users can directly use the prebuilds whereas other version users need to build and install the SDK on their system.

Commands to Build SDK Samples

The steps to build SDK samples are as follows:

1. Change the location to the Source folder in the extracted package using the following command.

```
$ cd
<Extracted_Package_Location>/Tara_SDK_LINUX_REL_PACKAG
E_xxxx/Source
```

2. Before running the Makefile, you must run the following command.

```
$ ./configure.sh
```

- It will download and build the necessary dependencies and OpenCV library 3.4.1, so that these can be used and linked while building the SDK samples. Running this command, will implement all the necessary changes that are mentioned in Dependencies to be Installed and To install Point Cloud Library in Ubuntu 16.04, you must run the following command.

```
$ sudo apt-get install libpcl-all
```

Note :

If the above problem persists, then upgrade the cmake version. (sudo apt-get install cmake-data cmake).

Developing Applications with Tara using OpenCV sections.

Note: There is no need to perform these sections separately.

3. To build all the libraries, samples and applications provided in the SDK, you must run the following command.

```
$ sudo make
```

Note 1: For 14.04 ubuntu version, Makefile for every application to be changed, In Makefile, OPENCV_LIBS=-L $(OPENCV_INSTALL_PREFIX)/lib/**(x86_64-linux-gnu for 64-bit version or i386-linux-gnu for 32-bit version) .** This will be known from the path **/usr/local/tara-opencv/lib/**.

Note 2: For pointcloud application in 14.04 ubuntu version, the makefile is further modified with different **vtk** version in **CFLAGS** as **/usr/include/vtk-<version>.**

4. To install the built libraries and binaries into a specific path **/usr/local/tara-sdk** and to add that path to the required configuration files, you must run the following command.

```
$ sudo make install
```

5. To reload the shell for using the modified environment variables, you must run the following command.

```
$ source ~/.bashrc
```

After successful installation, start to execute the installed samples. Please refer to Executing the Samples section in *Tara_SDK_Linux_User_Manual.pdf*.

Note: Based on the system configuration and internet connectivity speed, the process of building and installing the SDK samples takes 1-2 hours of time. On an Intel-i7 system with 8GB RAM, it took nearly 1 hour to complete the process.

Dependencies to be Installed

For using OpenCV and Point Cloud Library, you must install the dependencies as follows:

- To install some general development libraries, you must run the following command.

```
$ sudo apt-get install build-essential make cmake
cmake-qt-gui g++
```

- To install libav video input or output and glib development libraries, you must run the following command.

```
$ sudo apt-get install libavformat-dev libavutil-dev
libswscale-dev libglib2.0-dev libtbb-dev
```

- To install video4Linux camera development libraries, you must run the following command.

```
$ sudo apt-get install libv4l-dev
```

- To install eigen3 math development libraries, you must run the following command.

```
$ sudo apt-get install libeigen3-dev
```

- To install openGL development libraries (to allow creating graphical windows), you must run the following command.

```
$ sudo apt-get install libglew-dev
```

- To install GTK development libraries (to allow creating graphical windows), you must run the following command.

© Copyright e-con Systems. 2017. All rights reserved.

```
$ sudo apt-get install libgtk2.0-dev
```

- To install Udev development libraries (to allow access to device information), you must run the following command.

```
$ sudo apt-get install libudev-dev
```

- To install Point Cloud Library in Ubuntu 14.04, you must run the following command.

```
$ sudo add-apt-repository ppa:v-launchpad-jochen-sprickerhof-de/pcl
$ sudo apt-get update
$ sudo apt-get install libpcl-all
```

- To install Point Cloud Library in Ubuntu 16.04, you must run the following command.

```
$ sudo apt-get install libpcl-all
```

Note :

```
The following packages have unmet dependencies:
 cmake : Depends: cmake-data (>= 2.8.12.2)
E: Unable to correct problems, you have held broken packages.
```

If the above problem persists, then upgrade the cmake version. (sudo apt-get install cmake-data cmake).

Developing Applications with Tara using OpenCV

The OpenCV 3.4.1 version must be built with added custom format support (Y16) to stream Tara camera. The steps used inside the configure shell script to install OpenCV are as follows:

1. Download the latest version of opencv (Version 3.4.1) for Linux using https://github.com/opencv/opencv/tree/3.4.1 link.
2. Download the contrib modules additionally from the github repository using https://github.com/opencv/opencv_contrib/tree/3.4.1 link.
3. Build the OpenCV library with TBB support and contrib modules, and without LIBV4L.
4. Install the package in a specific path **/usr/local/tara-opencv**.
5. Add the installed library path to a configuration file **/etc/ld.so.conf.d/01-tara-opencv.conf**, to search for the libraries automatically when it is needed.

Note: e-con Systems have tested the Tara SDK in Ubuntu 14.04 and Ubuntu 16.04 platforms. The Point Cloud Library has not officially launched the Personal Package Archives (PPAs) for versions higher than Ubuntu 14.10. For Ubuntu 16.04, pcl can be installed using "**sudo apt-get install libpcl-dev**". please use Makefiles as reference in building the samples.

Run the Tara Sample Applications

1. In 16.04 Ubuntu version, run the command

```
$ sudo ./<Application_executable_name>
```

2. In 14.04 Ubuntu versions, run the command

```
$ sudo LD_LIBRARY_PATH=/usr/local/tara-
opencv/lib/<i386-linux-gnu (or) x86_64-linux-gnu>
./<Application_executable_name>
```

© Copyright e-con Systems. 2017. All rights reserved.

What's Next?

After understanding the building and installation of samples given in the Linux SDK package, you can refer to the *Tara SDK User Manual Linux* documents to understand more about Tara.

Support

Contact Us

If you need any support on Tara product, please contact us using the Live Chat option available on our website - https://www.e-consystems.com/

Creating a Ticket

If you need to create a ticket for any type of issue, please visit the ticketing page on our website - https://www.e-consystems.com/create-ticket.asp

RMA

To know about our Return Material Authorization (RMA) policy, please visit the RMA Policy page on our website - https://www.e-consystems.com/RMA-Policy.asp

General Product Warranty Terms

To know about our General Product Warranty Terms, please visit the General Warranty Terms page on our website - https://www.e-consystems.com/warranty.asp

© Copyright e-con Systems. 2017. All rights reserved.

Revision History

Rev	Date	Description	Author
1.1	09-Aug-2016	Initial Draft	Karthikeyan.A
1.2	08-Jun-2018	Added support for Ubuntu version 16.04, Latest Opencv version 3.4.1 support and IMU Revision-B Firmware	Chandra Sekar. V
1.3	04-07-2018	Added support for the Ubuntu version 14.04 make file changes	Chandra Sekar. V
1.4	16-Jul-2018	Added changes to resolve cmake dependencies	Chandra sekar.V