Document for software setting up on TK1/TX1

Installation for Jetpack L4T:

Introduction:

The Jetson Development Pack for Linux for Tegra (JetPack L4T) is an installer that automates installing and setting up a development environment required to develop for the NVIDIA® Jetson Embedded Platform, including flashing your Jetson Developer Kit with the latest OS images.

What's included in Jetpack:

In general, after installing this Jetpack, you will have Ubuntu14.04, CUDA Toolkit, OpenCV and cuDNN in TK1/TX1.

Go to this website for more details:http://docs.nvidia.com/jetpack-l4t/2_2_1/index.html#developertools/mobile/jetpack/l4t/2.2.1/jetpack_l4t_whats_included.htm

Installation:

Nvidia provides a clear installation guide which works perfectly for Jetpack L4T, please go to the address below and following their guide:

http://docs.nvidia.com/jetpack-l4t/2_2_1/index.html#developertools/mobile/jetpack/l4t/2.2.1/jetpack_l4t_install.htm

Notes:

We are using version 2.2.1 for jetpack in our project. This is because this is the latest version that uses CUDA 7.0. Any version higher than this is using CUDA 8.0 which is quite new. Some softwares like Caffe may not support this. For TK1, there will be no problem. However if you are using TX1, please remember to install the 32-bits version jetpack unless you have a great need for 64 bits system.

Following the guides on f1theth:

On f1tenth's website, they provide guides for installation of basic softwares for this platform, however, there are many errors in their files which could cause lots of trouble. Here I am going to go through those guides and correct all the errors they have in their guides. First please go to this address and download all the tutorials: http://f1tenth.org/lectures

Installing ROS on TX1:

There are three versions of ROS now. Most of the tutorials and open source ROS packages are based on ROS indigo. Hence we strongly recommend to install ROS indigo on TK1/TX1.

If you are using TK1 or a 32-bit system on TX1, it will be very easy to install ROS, just go to the following link provides specific installation guide: http://wiki.ros.org/indigo/Installation/UbuntuARM

However, things will be quite different if you are using a 64-bit system on TK1. There are no current Debian packages to install ROS available on a arm64 architectures. To install that, you have to compile from source. Below is the link for that, but we didn't try this so we don't know whether this will work or not.

http://wiki.ros.org/indigo/Installation/Source

Note:

During installation, you will choose what packages to install. Here we recommend ROS-Base Install. This includes most of ROS libraries but will save a lot of storage in TX1 comparing to full installation. You can install those simulation tools in the future if you need to do simulation in TX1.

Setting up the wireless network:

This part is in the tutorial 4 on f1tenth website. There are something ambiguous in the tutorial and here are the notes.

On the first page, **Configure the Jetson for a static IP on the 192.168.1.x subnet** section. It says x

could be any number. However, here we strongly recommend to use 1 for x. Otherwise it may cause conflict with Lidar address in the future. If you insist using a number other than 1, please remember to put that number in the gateway IP in the **Configuring the PicoStation section.**

Configuring the Hokuyo UST 10LX:
There are two ways for Lidars to communicate with Jetson, first way is through ethernet, the second is through serial. Here we recommend the ethernet way. It is in the extras of tutorial 5:
http://f1tenth.org/lab_instructions/t5a.pdf
The tutorial is mostly correct, however, it lacks the connection specifications. There are two cables on the Lidar. One is an ethernet cable, the other one is a five -wires cable. First you need to have a USB-to-ethernet adapter. Put the Lidar's ethernet cable in and then plugin USB to Jetson. Powering up the Lidar requires you cut the five-wires cable and customize a power system. The building tutorial will talk about this more.

Installation for ROS-Caffe:
We are using an open-source ROS-Caffe node, here is the link We tested this one and if works pretty well.https://github.com/tzutalin/ros_caffe

Install ZED-wrapper for ZED camera:
ZED-wrapper is the ros-node for using Zed camera, to use this, first you will have to install ZED SDK:https://www.stereolabs.com/developers/release/1.2/
After that you can start to install ZED-wrapper from here:
https://github.com/stereolabs/zed-ros-wrapper
From our experience, you should use the version of 0.9.x for TK1 or TX1. The other versions may fail during installation. This is not in the master branch. You can find this if you press branch and then tags.

Above are the setting up for F1tenth prototype. If you have any problem, feel free to contact me. My email addrress is guohc@bu.edu. Good luck.