TaraXL

ISAAC SDK Installation Manual

e-con Systems

Your Product Development Partner

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Contents

This package provides ISAAC codelet for See3CAM_StereoA and STEEReoCAM camera.

STEEReoCAM™ is a 2 MP 3D MIPI Stereo camera for NVIDIA® Jetson AGX Xavier™/TX2/Nano™ development kit which supports 2 MP ((2*1600) x 1300) at 30 fps. This MIPI Stereo camera is based on 1/2.9" OV2311 global shutter CMOS sensor from OmniVision. The front view of STEEReoCAM™ is shown below.

Figure 1: Front View of STEEReoCAM

TaraXL cameras (STEEReoCAM) are ideal for applications such as depth sensing, robotics and autonomous guided vehicles, face recognition, gesture recognition, drones, 3D video recording, 3D measurements, embedded vision, surgical robotics, and so on.

The commands and output messages in this manual are represented by different colors as listed in below table.

Table 1: Notation of Colors

Color	Notation
Blue	Commands running in host PC
Green	Output message in Terminal
Orange	Commands running in Jetson™ board

This document explains how to install ISAAC SDK for TaraXL cameras.

Prerequisites

The prerequisites are as follows:

- BSP with support for TaraXL camera
- ISAAC SDK
- TaraXL ISAAC package

TaraXL ISAAC Codelet

The TaraXL ISAAC codelet provides the following functionalities:

- Publishes rectified and raw frames from the camera
- Publishes camera intrinsic and extrinsic of both raw and rectified frame
- Publishes linear acceleration and angular velocity values from camera IMU
- Downscale resolution through ISAAC params

STEEReoCAM supports the below four resolutions,

1. 2x1600 x 1300

2. 2x768x576

3. 2x640x480

4. 2x320x240

This section describes the installation steps of ISAAC SDK for TaraXL cameras.

1. Install the BSP with support for TaraXL camera in Jetson Xavier™/TX2/Nano™.

   Before extracting the release package and flashing the e-con Systems provided binaries in Jetson™ development kit, you must flash the latest JetPack™ 4.3 provided by NVIDIA® using the SDK Manager.

   a. Download and install the NVIDIA® SDK Manager in your Host PC using the instructions given in the below link.

   https://developer.nvidia.com/nvidia-sdk-manager

   Note: You must sign up to an account in the NVIDIA® developer site to use the SDK Manager.

   b. Run the SDK Manager and flash the Jetson™ development kit with JetPack™ 4.3 using the instructions given in the below link.

   https://docs.nvidia.com/sdk-manager/install-with-sdkm-jetson/index.html

   Note: Make sure that the SDK components are installed.

   c. Download the BSP release package with STEEReoCAM support
      i. https://www.dropbox.com/sh/8fdb9wshksnuw0f/AACYV0MdNdpd3tahOfykpbTka?dl=0
   d. Copy the release package into the home directory of the flashed Jetson™ development kit.
   e. Run the following commands to extract the release package in the Jetson™ development kit to obtain the binaries.

   ```
   tar -xampf e-
   CAM20_Stereo_CUMI2311_TX2_JETSON_<L4T_Version>_<rele
   ase_date>_<release_version>.tar.gz
   cd e-
   CAM20_Stereo_CUMI2311_TX2_JETSON_<L4T_Version>_<rele
   ase_date>_<release_version>
   ```

   f. Run the following commands to install the binaries.

   ```
   sudo chmod a+x ./install_binaries_<version>.sh
   sudo ./install_binaries_<version>.sh
   ```

   The above script will reboot the Jetson™ development kit automatically after installing the binaries successfully.

2. Download the ISAAC SDK in the host PC from the below link.

https://developer.nvidia.com/isaac/downloads

Where, ISAAC SDK Version - 2019.3

3. Install the ISAAC SDK and Robot in host PC using the instructions given in the below link.

   https://docs.nvidia.com/isaac/isaac/doc/setup.html

4. Download taraxl-isaac-package source code in host PC from the below git link.

   https://github.com/econsystems/taraxl-isaac-package.git

5. Run the following install.sh script to deploy taraxl related packages into the ISAAC directory.

   ```
   # cd taraxl-isaac-package
   # ./install.sh
   ```

6. Enter the absolute path of ISAAC SDK (for example, /home/{$USERNAME}/Isaac): <ISAAC Directory>.

This section describes how to deploy TaraXL package.

To deploy and run TaraXL package, follow the below instructions in the host PC.

For STEEReoCAM Camera (MIPI)

Run the following command to deploy TaraXL camera package.

```
# ./engine/build/deploy.sh --remote_user nvidia -p
//apps/samples/taraxl_camera:taraxl_camera-pkg -d
jetpack43 -h <ROBOT IP>
```

Run the following command to deploy TaraXL IMU package.

```
# ./engine/build/deploy.sh --remote_user nvidia -p
//apps/samples/taraxl_imu:taraxl_imu-pkg -d jetpack43 -h
<ROBOT IP>
```

Running TaraXL ISAAC Codelets

This section describes how to run the TaraXL ISAAC codelets.   To run taraxl_camera-pkg and taraxl_imu-pkg package, it requires TaraXL cameras. Connect the camera to Jetson™ TX2/Xavier™/Nano™ platform device to view the preview in Websight.

The steps to run the TaraXL ISAAC codelets are:

1. Running TaraXL Camera Package
2. Running TaraXL IMU Package

Running TaraXL Camera Package

The steps to run TaraXL camera package are as follows:

1. Run the following commands in Jetson™ development kit after deploying the package.

```
cd /home/nvidia/deploy/${USERNAME}/taraxl_camera-pkg
./apps/samples/taraxl_camera/taraxl_camera
```

2. Start the ISAAC Sight by clicking the below link.

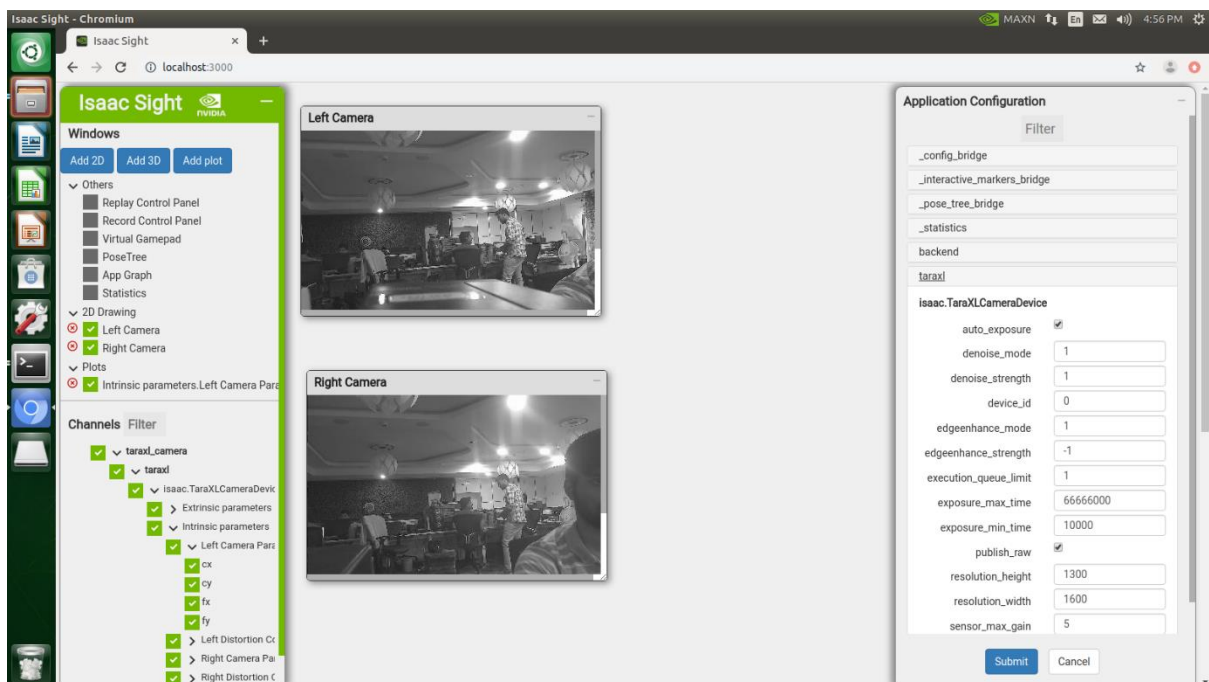http://localhost:3000

You can view the preview as shown below.

Figure 3: ISAAC Sight Initial Window by running TaraXL Camera Package

3. To view intrinsic and extrinsic data

The steps to view intrinsic and extrinsic data are as follows:

1. In **Channels** menu, select **taraxl_camera** node.
2. Select both the **Intrinsic parameters** and **Extrinsic parameters** check boxes to receive data.
3. Right-click the **Extrinsic parameters** check box.
4. Select the Create new plot option.
5. Enter any name of your choice.
6. Now, the extrinsic parameters will be displayed in the plot. Similar steps must be followed to visualize intrinsic parameters.

Running TaraXL IMU Package

The steps to run TaraXL IMU package are as follows:

1. Run the following commands in Jetson™ development kit after deploying the package.

```
cd /home/nvidia/deploy/${USERNAME}/taraxl_imu-pkg
./apps/samples/taraxl_imu/taraxl_imu
```

2. Start the ISAAC Sight by clicking the below link.

http://localhost:3000
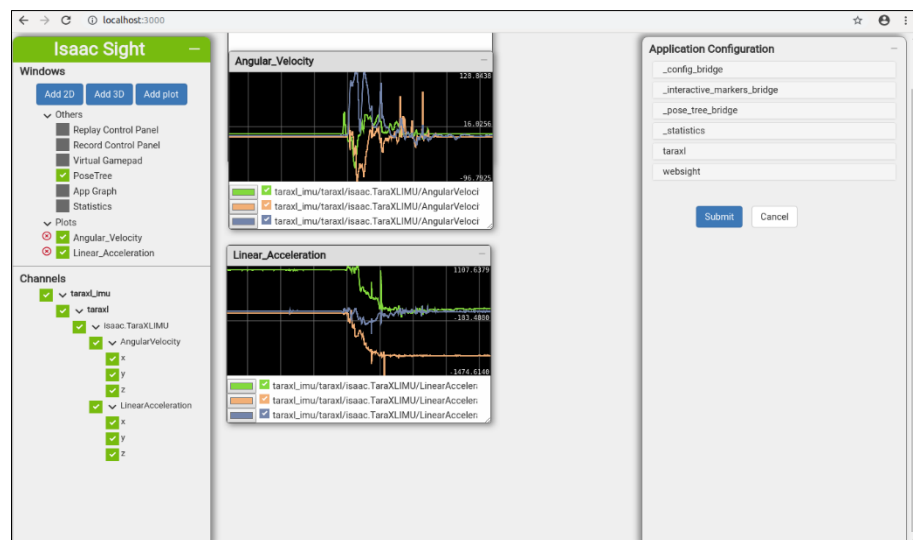
You can view the preview as shown below.

Figure 4: ISAAC Sight Initial Window by running TaraXL IMU Package

3. To view IMU data

The steps to view IMU data are as follows:

1. In **Channels** menu, select taraxl_imu node.
2. Select both the **Angular_Velocity** and **Linear_Acceleration** check boxes to receive data.
3. Right-click the **Angular_Velocity** check box.
4. Select the Create new plot option.
5. Enter any name of your choice.

Now, the angular velocity will be displayed in the plot. Similar steps must be followed to visualize linear acceleration.

CMOS: Complementary Metal Oxide Semiconductor.

IMU: Inertial Measurement Unit.

MIPI: Mobile Industry Processor Interface.

SDK: Software Development Kit.

Contact Us

If you need any support on TaraXL 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

Revision History

Rev	Date	Description	Author
1.0	03-December-2019	Initial draft	Vision Team
2.0	16-March-2019	Initial draft	Vision Team