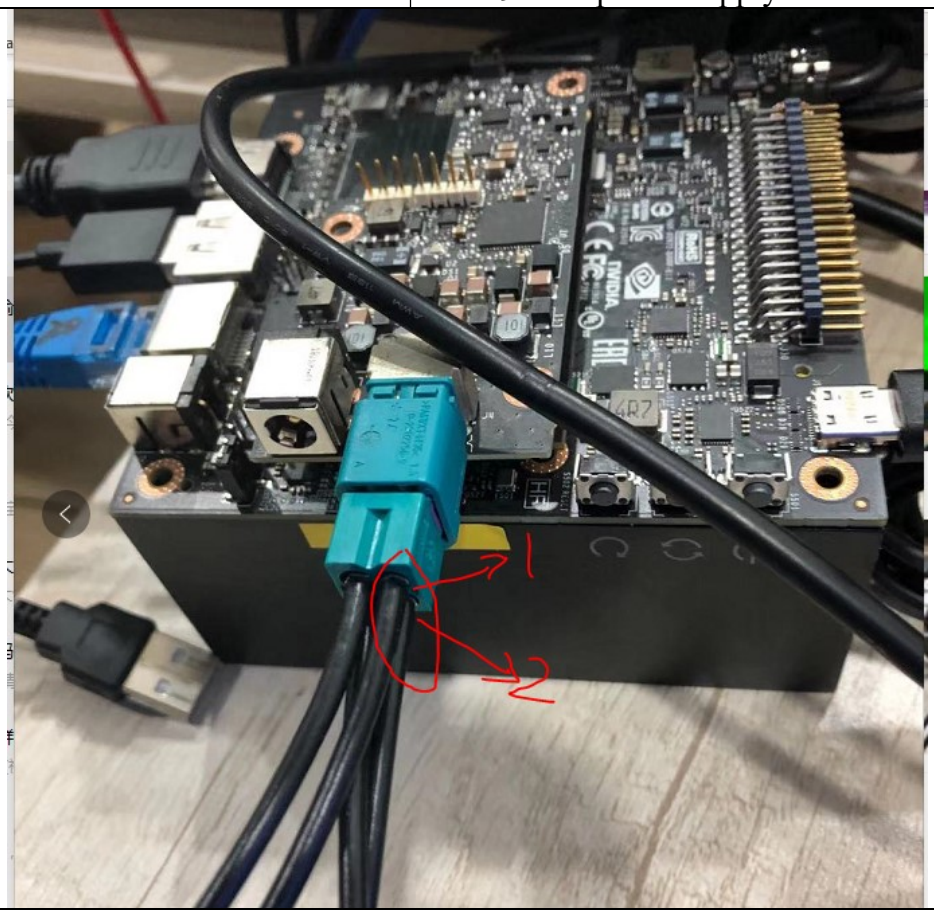
Overview

This driver is for LI-AR0234CS-GMSL2-OWL V1.0 camera kit with Nvidia Jetson AGX Xavier Developer kit.
This driver supports four LI-AR0234CS-GMSL2-OWL V1.0 cameras.
This driver supports 1920x1200@30fps
This driver is based on R32.7.

Download link

Platform	Camera
Nvidia Jetson AGX Xavier Developer kit	4 x LI-AR0234CS-GMSL2-OWL V1.0
Cable	Adapter/Carrier Board
1 x FAK-SMZSMZ	1 x NVIDIA max96712 adapt board(E3653-a03). 1 x 19VDC power supply



Revision	SVN version	Release Date	Author	Tested by
20220321		03/21/2022	Xingxing Gu	

Updates

Revision	Description	Release Date
20220321	First Release based on R32.7	20220321

Known bugs

Setup Procedure 1/2

Driver installation:

1. Download the R32.7 OS Image (from link below) to your Ubuntu OS on Intel x64 Host PC (we are using Ubuntu 18.04, virtual machine is fine) and follow the l4t_quick_start_guide to install the Jetpack to Xavier.

R32.7 OS Image:

2. Reboot Xavier and Put your system into "reset recovery mode" by holding down the RECOVER button and press the RESET button once on the Xavier.
3. Copy the tegra194-p2888-0001-p2822-0000.dtb (which was downloaded from the link in first page) and paste it under Xavier/Linux_for_Tegra/kernel/dtb on your Ubuntu host PC.

4. Under Xavier/Linux_for_Tegra/ do
sudo ./flash.sh -k kernel-dtb jetson-xavier mmcblk0p1

```
*** The [kernel-dtb] has been updated successfully. ***
ubuntu@ubuntu-GA-MA770T-UD3P:~/32.4.2/tx2/Linux_for_Tegra$ sudo ./flash.sh  -r -k kernel-dtb jetson-xavier mmcblk0p1
```

If flash the dtb file successfully, the log should be like below.

Setup Procedure 2/2

5. After boot up Xavier, copy “Image” to /boot on Xavier.

```
nvidia@nvidia-desktop:~/Downloads$ sudo cp Image /boot/
```

6. Plug in 19V power supply to Xavier kit.
7. insmod max96712.ko, ar0234.ko orderly.
8. open a terminal and do below command. You will get live video output.

$ nvgstcapture

8. Use Ctrl+C to close the video and copy camera_overrides.isp to /var/nvidia/nvcam/settings on Xavier and do below two command.

$ sudo chmod 664 /var/nvidia/nvcam/settings/camera_overrides.isp
$ sudo chown root:root /var/nvidia/nvcam/settings/camera_overrides.isp

```
nvidia@nvidia-desktop:~/Downloads$ sudo cp camera_overrides.isp /var/nvidia/nvca
m/settings/
nvidia@nvidia-desktop:~/Downloads$ sudo chmod 664 /var/nvidia/nvcam/settings/cam
era_overrides.isp
nvidia@nvidia-desktop:~/Downloads$ sudo chown root:root /var/nvidia/nvcam/settin
gs/camera_overrides.isp
nvidia@nvidia-desktop:~/Downloads$
```

Run Camera

1. Argus software

Download the Multimedia package from link below and copy it to Xavier.

Open a terminal, do
```
sudo apt-get update
sudo apt-get install cmake libgtk-3-dev libjpeg-dev libgles2-mesa-dev libgstreamer1.0-dev
```

Uncompress the tgz package,
```
tar zxvf Multimedia_JXAV_R32.7.tgz
```

Under tegra_multimedia_api/argus/cmake, do
```
cmake ..
make
sudo make install
```

Do "argus_camera --device=0" to get the video.

2. Gstreamer

```
gst-launch-1.0 nvarguscamerasrc sensor-id=0 ! 'video/x-raw(memory:NVMM), width=(int)1920, height=(int)1200, framerate=30/1'  ! nvvidconv flip-method=0 ! 'video/x-raw, format=(string)I420' ! xvimagesink -e
```

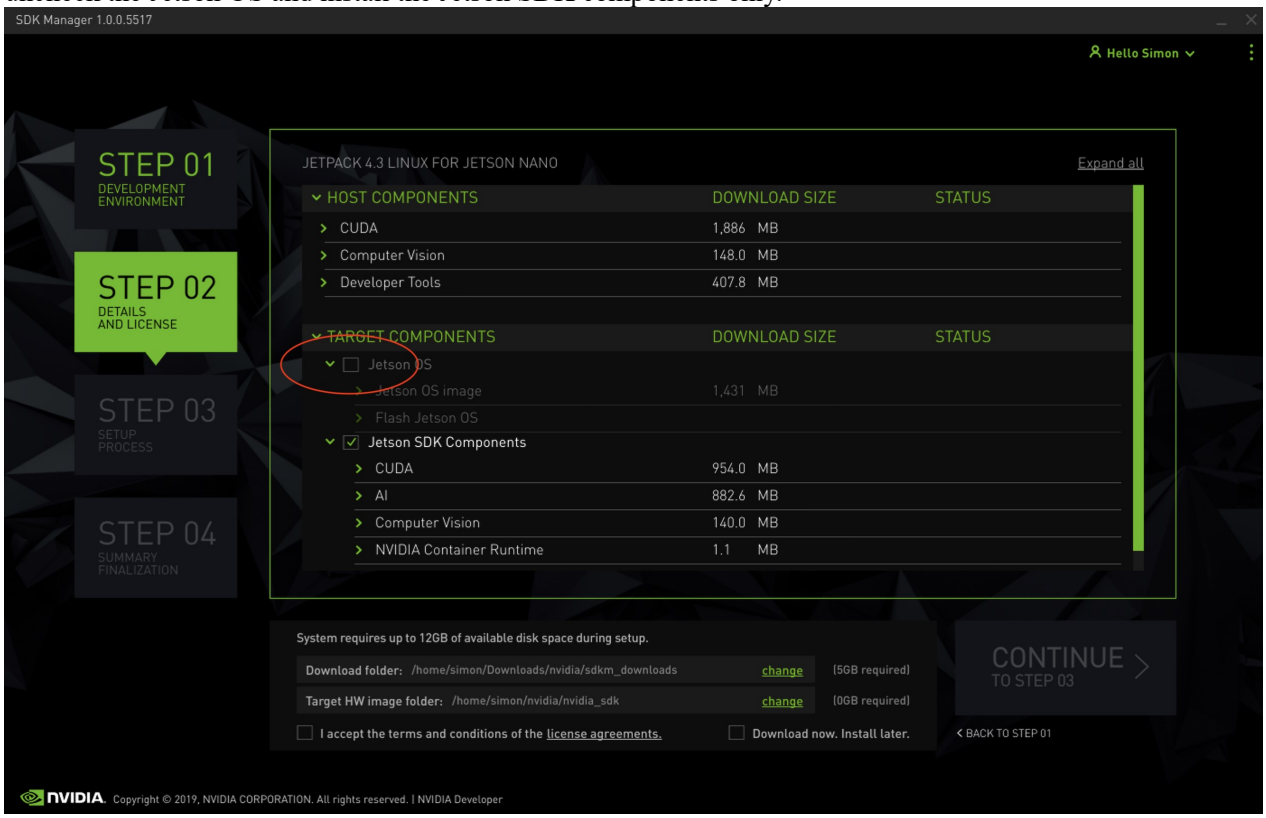
3. v4l2-ctl capture raw

```
v4l2-ctl -V --set-fmt-video=width=1920,height=1200,pixelformat=RG10 --set-ctrl bypass_mode=0 --stream-mmap --stream-count=1 --stream-to=ar0234.raw -d /dev/video0
```

Please use below commands to install v4l2.
```
sudo apt-get update
sudo apt-get install v4l-utils
```

Note 1/2

1. If you would like to install the Jetpack 4.6.1 but don't want to re-flash the whole OS image, you can uncheck the Jetson OS and install the Jetson SDK components only.



Note 2/2

4. Compile the driver

If you would like to re-compile the driver, please follow below steps.
Download the driver code and Tool chain from links below.

Kernel code:
GCC ToolChain: https://www.dropbox.com/sh/f21qck6f29h3n20/AABP8B1b4DgmUgO2MYO32Nyza?dl=0

Compile the kernel under 64 bit Ubuntu OS on Intel x64 PC. (Virtual machine is fine. We are using Ubuntu 18.04 64 bit OS)

1) Copy compile tool gcc-linaro-7.3.1-2018.05-x86_64_aarch64-linux-gnu.tar.xz to /opt, and unzip it

```
sudo tar xpf gcc-linaro-7.3.1-2018.05-x86_64_aarch64-linux-gnu.tar.xz
```

2) Copy kernel_src_JXAV_R32.7.tbz2 and two patch files to /usr/src

```
sudo tar xpf kernel_src_JXAV_R32.7.tbz2
sudo chown -R <user_name> kernel
sudo chown -R <user_name> hardware
patch -p1 < streaming_AR0234CS-STEREO-GMSL2_base32.7_Xavier_kernel_dts_20210206.patch
```

Note: <user_name> is the user name of your Ubuntu OS. For example: sudo chown -R leopard kernel

3) Copy xavier.sh to /usr/src/kernel.

```
under /usr/src/kernel, do
source xavier.sh
```

4) Create a work folder under /home:

```
sudo mkdir /home/work
sudo chown -R <user_name> /home/work
```

5) In "kernel/kernel-4.9" folder, run:

```
make O=$TEGRA_KERNEL_OUT tegra_defconfig
make O=$TEGRA_KERNEL_OUT zImage
make O=$TEGRA_KERNEL_OUT dtbs
```

You will get Image under /home/work/Xavier/kernel/kernel_out/arch/arm64/boot and tegra194-p2888-0001-p2822-0000.dtb under /home/work/Xavier/kernel/kernel_out/arch/arm64/boot/dts.