Jetson Nano 환경설정
& Raspberry Pi Cam 연동

인턴 송진호/이우림

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Jetson Nano 환경설정

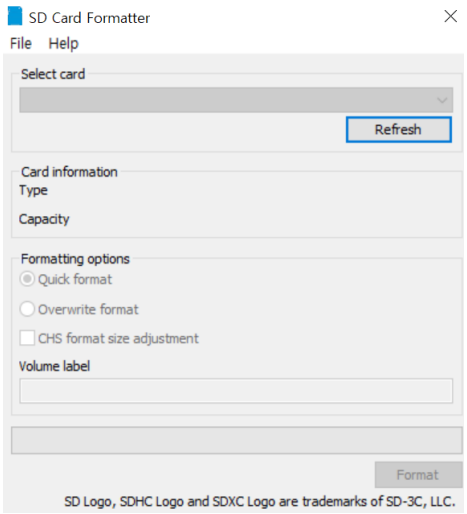
- SD card 포맷
- Jetson Nano
- 메모리 환경 늘리기
- OpenCV 설치
- Python 버전 변경

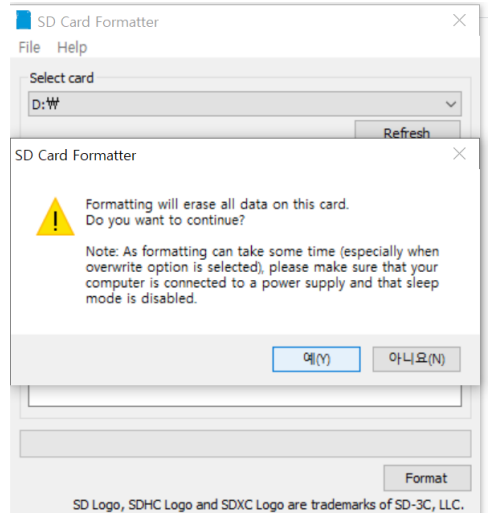
SD card 포맷

- SD card formatter 다운로드

  : SD Memory Card Formatter for Windows Download - SD Association (sdcard.org)

  1. SD card 드라이브를 선택한 후 Quick format 을 선택
  2. Volume label을 비워 두고 format을 클릭 한 후 '예' 클릭



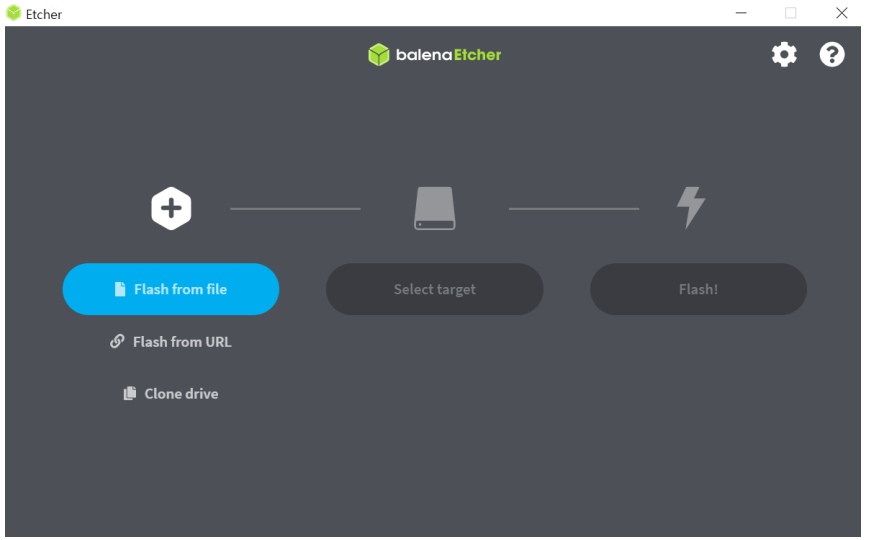


- 이미지(JetPack)/Etcher 다운로드

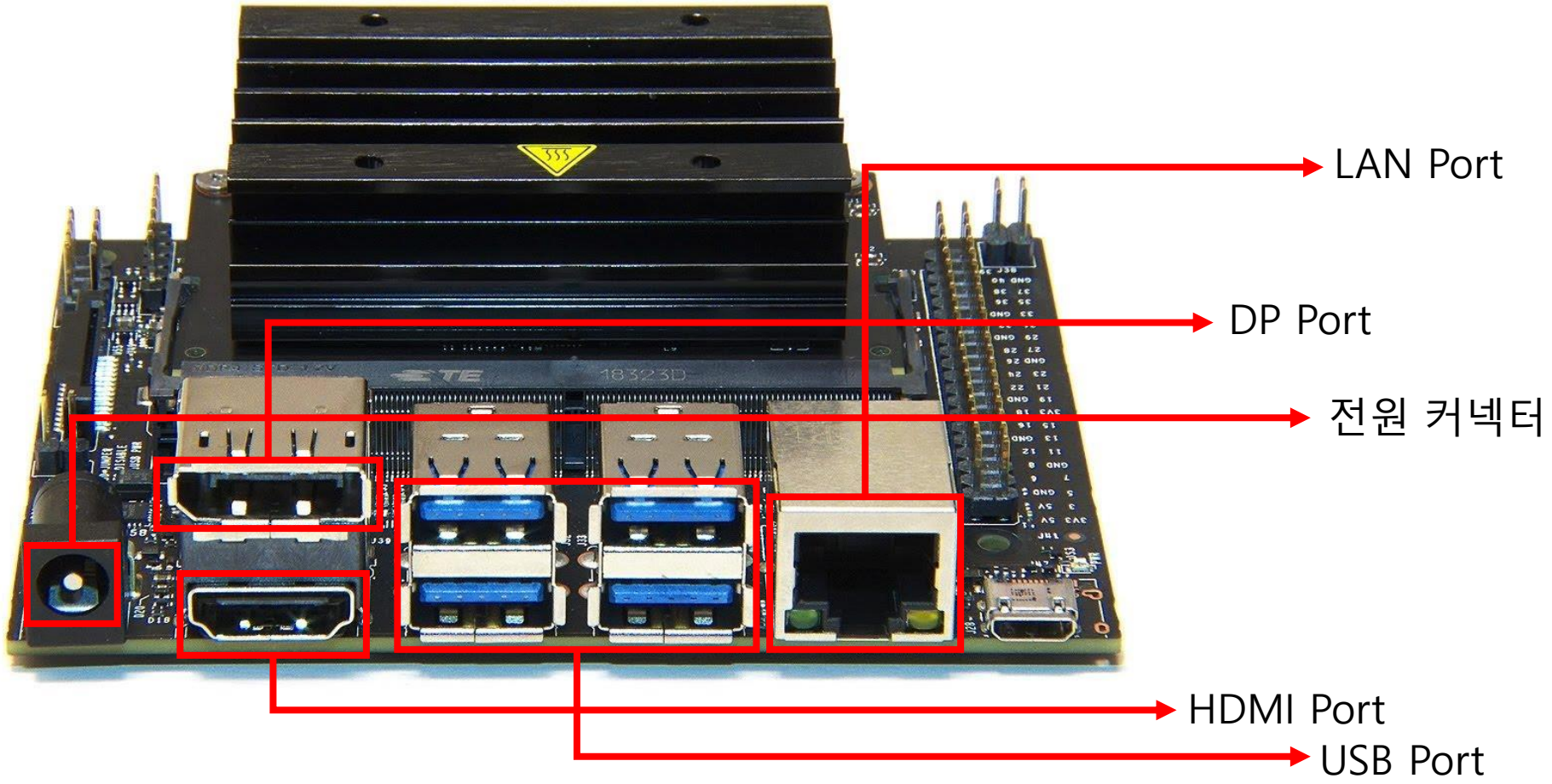
  : https://developer.nvidia.com/jetson-nano-sd-card-image-r3231

  : https://www.balena.io/etcher

  1. PC에 micro SD card 삽입
  2. 이미지 압축파일 선택 후 Select targe에서 sd card 선택

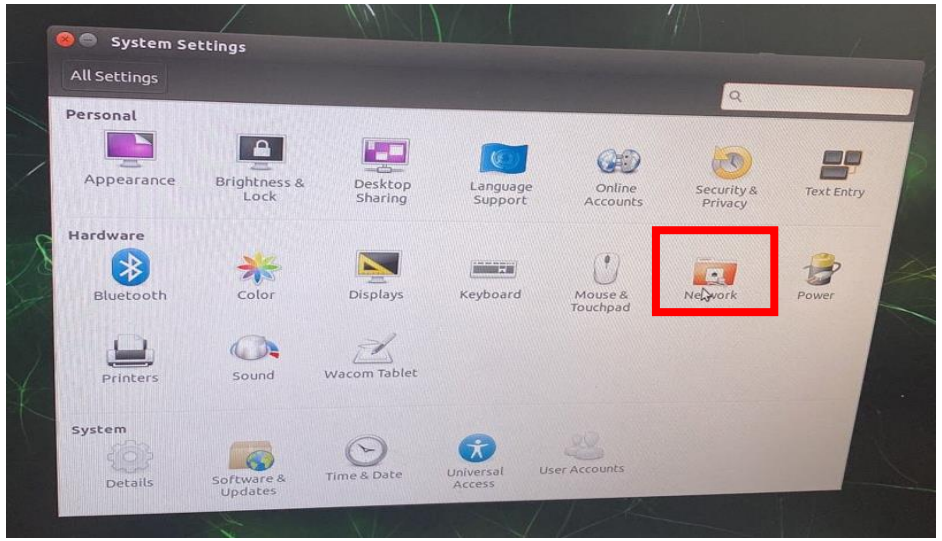


Jetson Nano



Jetson Nano

1



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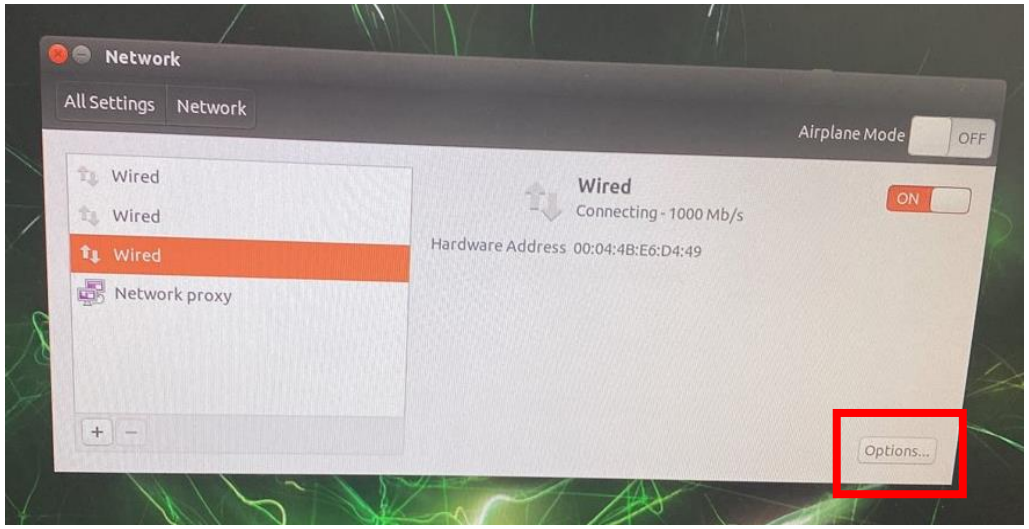

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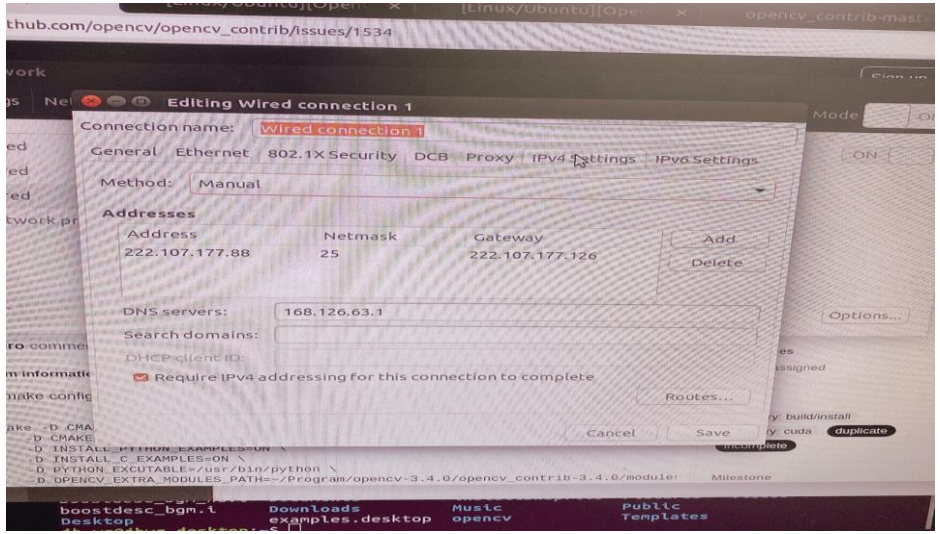

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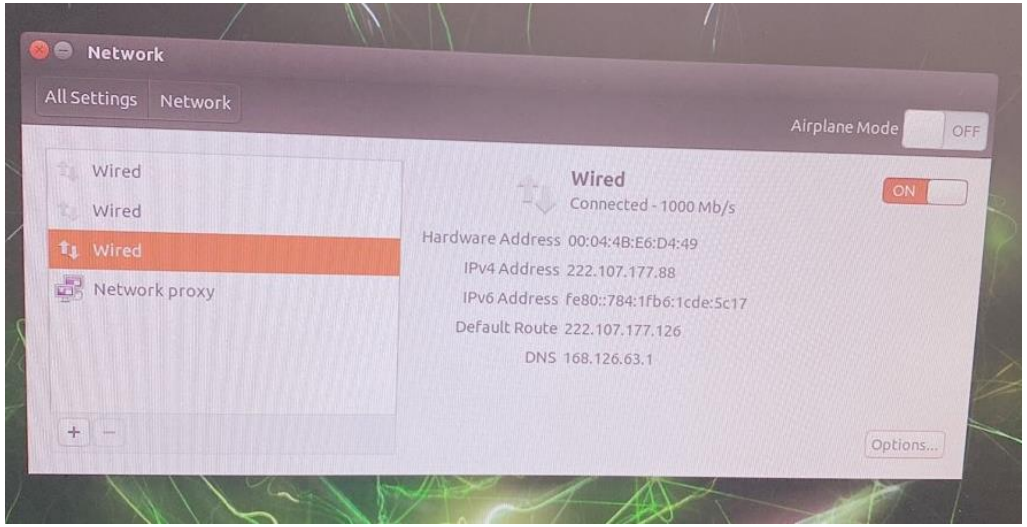


메모리 환경 늘리기

- OpenCV 설치 과정 중 Jetson Nano가 작동되지 않을 수 있어 가상메모리(swapfile)를 통해 용량을 늘려준다

```
$ git clone https://github.com/JetsonHacksNano/installSwapfile
$ cd installSwapfile
$ ./installSwapfile.sh
```

OpenCV 설치

- Ubuntu 18.04에 기본(Default) OpenCV 제거

```
$ sudo apt-get remove libopencv*
$ sudo apt-get autoremove
$ sudo find /usr/local/ -name "*opencv*" -exec rm {} ₩;
```

- Prerequisites 설치

```
$ sudo apt-get update
$ sudo apt-get upgrade
$ sudo apt-get install build-essential cmake unzip pkg-config
```

OpenCV 설치

- Libraries 설치

```
$ sudo apt-get install libjpeg-dev libpng-dev libtiff-dev
$sudo apt-get install libavcodec-dev libavformat-dev libswscale-dev libv4l-dev v4lutils
libxvidcore-dev libx264-dev libxine2-dev
$ sudo apt-get install libgstreamer1.0-dev libgstreamer-plugins-base1.0-dev
$ sudo apt-get install libgtk-3-dev
$ sudo apt-get install mesa-utils libgl1-mesa-dri libgtkgl2.0-dev libgtkglext1-dev
$ sudo apt-get install libatlas-base-dev gfortran libeigen3-dev
```

- Python 설치

```
$ sudo apt-get install python2.7-dev python3-dev python-numpy python3-numpy
```

OpenCV 설치

- OpenCV 3.4.0 다운로드

```
$ mkdir opencv
$ cd opencv
$ wget -O opencv.zip https://github.com/opencv/opencv/archive/3.4.0.zip
$ wget -O opencv_contrib.zip https://github.com/opencv/opencv_contrib/archive/3.4.0.zip
$ unzip opencv.zip
$ unzip opencv_contrib.zip
```

- Build & install OpenCV

```
$ cd opencv-3.4.0
$ mkdir build
$ cd build
```

OpenCV 설치

```
$ cmake -D CMAKE_BUILD_TYPE=RELEASE ₩
-D CMAKE_INSTALL_PREFIX=/usr/local ₩
-D WITH_TBB=OFF ₩
-D WITH_IPP=OFF ₩
-D WITH_1394=OFF ₩
-D BUILD_WITH_DEBUG_INFO=OFF ₩
-D BUILD_DOCS=OFF ₩
-D INSTALL_C_EXAMPLES=ON ₩
-D INSTALL_PYTHON_EXAMPLES=ON ₩
-D BUILD_EXAMPLES=OFF ₩
-D BUILD_TESTS=OFF ₩
-D BUILD_PERF_TESTS=OFF ₩
-D WITH_QT=OFF ₩
```

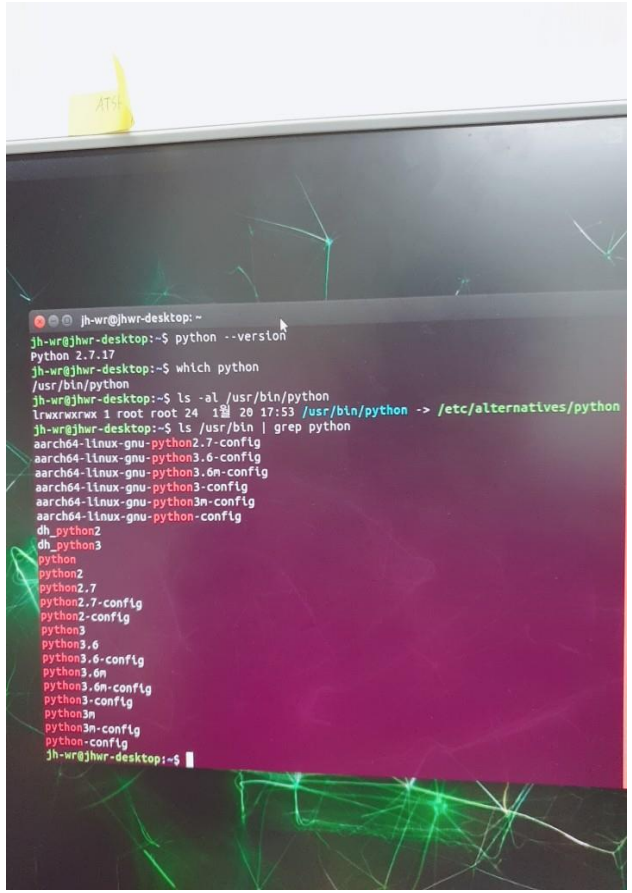
OpenCV 설치

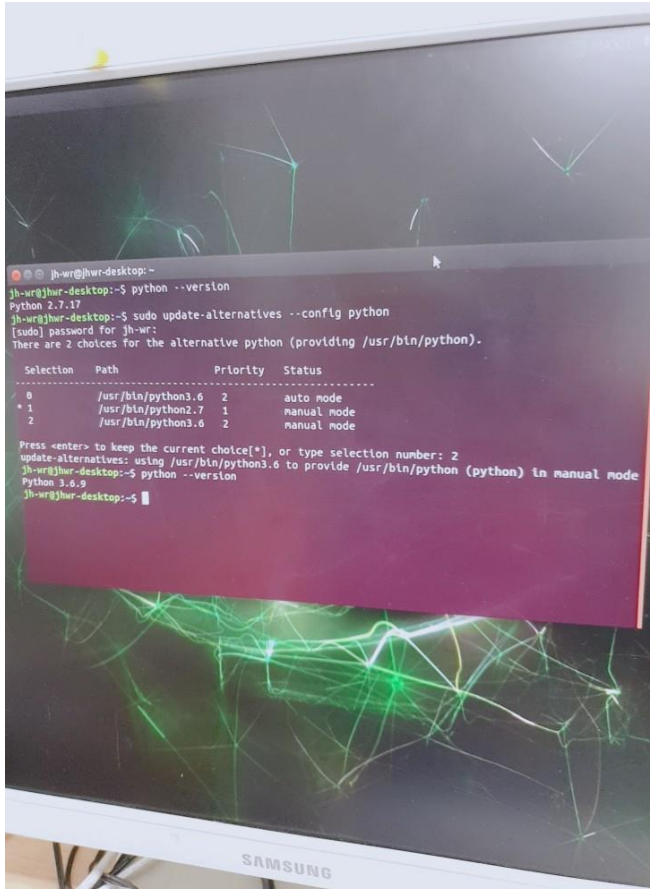
```
-D WITH_GTK=ON ₩
-D WITH_OPENGL=ON ₩
-D OPENCV_EXTRA_MODULES_PATH=../../opencv_contrib-3.4.0/modules ₩
-D WITH_V4L=ON ₩
-D WITH_FFMPEG=ON ₩
-D WITH_XINE=ON ₩
-D BUILD_NEW_PYTHON_SUPPORT=ON ₩
-D PYTHON2_INCLUDE_DIR=/usr/include/python2.7 ₩
-D PYTHON2_NUMPY_INCLUDE_DIRS=/usr/lib/python2.7/distpackages/numpy/core/include/ ₩
-D PYTHON2_PACKAGES_PATH=/usr/lib/python2.7/dist-packages ₩
-D PYTHON2_LIBRARY=/usr/lib/x86_64-linux-gnu/libpython2.7.so ₩
-D PYTHON3_INCLUDE_DIR=/usr/include/python3.6m ₩
-D PYTHON3_NUMPY_INCLUDE_DIRS=/usr/lib/python3/distpackages/numpy/core/include/ ₩
-D PYTHON3_PACKAGES_PATH=/usr/lib/python3/dist-packages ₩
```

OpenCV 설치

```
-D PYTHON3_LIBRARY=/usr/lib/x86_64-linux-gnu/libpython3.6m.so ₩
../
$ make -j4
```

Python 버전 변경





python –version
: 파이썬 버전 확인

Which python
: 파이썬이 설치된 위치 확인

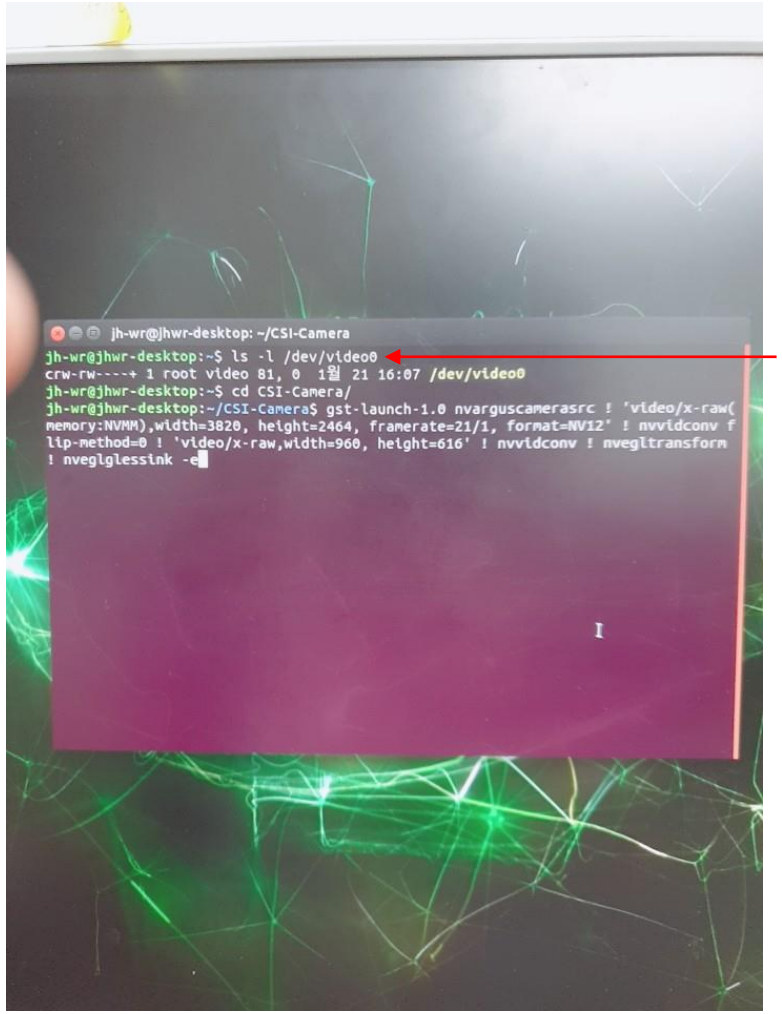
ls –a : 숨겨진 파일 및 디렉토리까지 표시

ls –l : 권한, 포함된 파일 수, 소유자, 그룹, 파일 크기 등 파일의 자세한 내용 표시

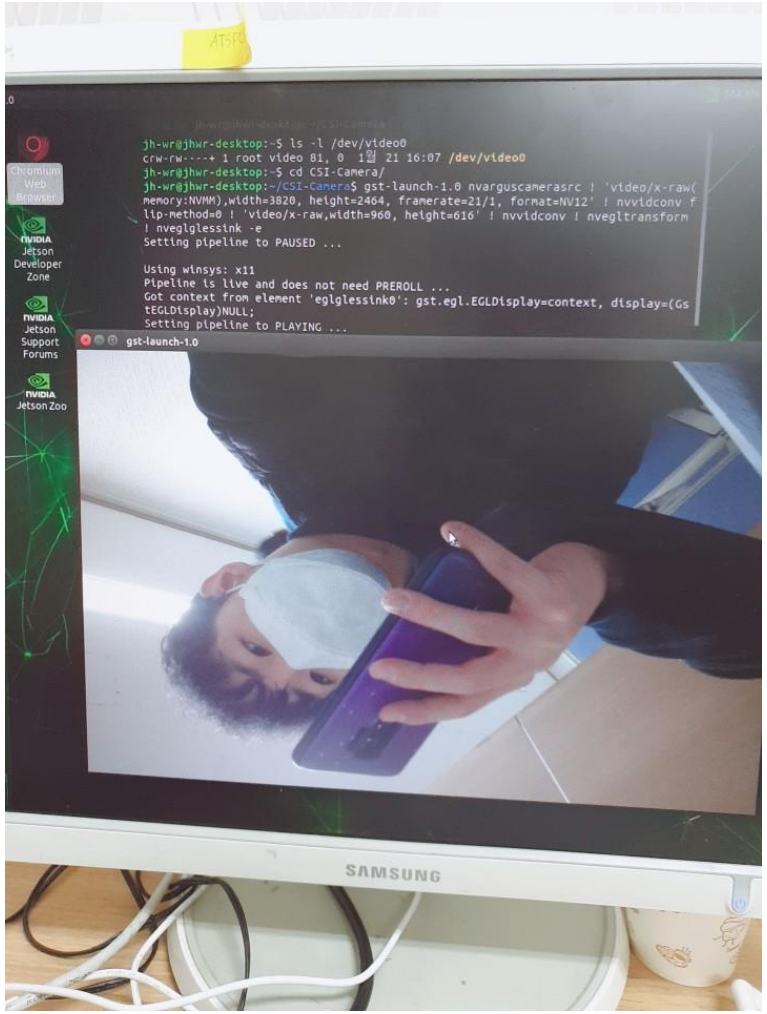
ls '위치' | grep python : '위치'에 존재하면서, 파일명에 python이 들어가는 파일 목록 전체 출력

sudo update-alternatives –config python
: 사용할 파이썬의 버전을 설정

Jetson Nano & Pi Cam 연동

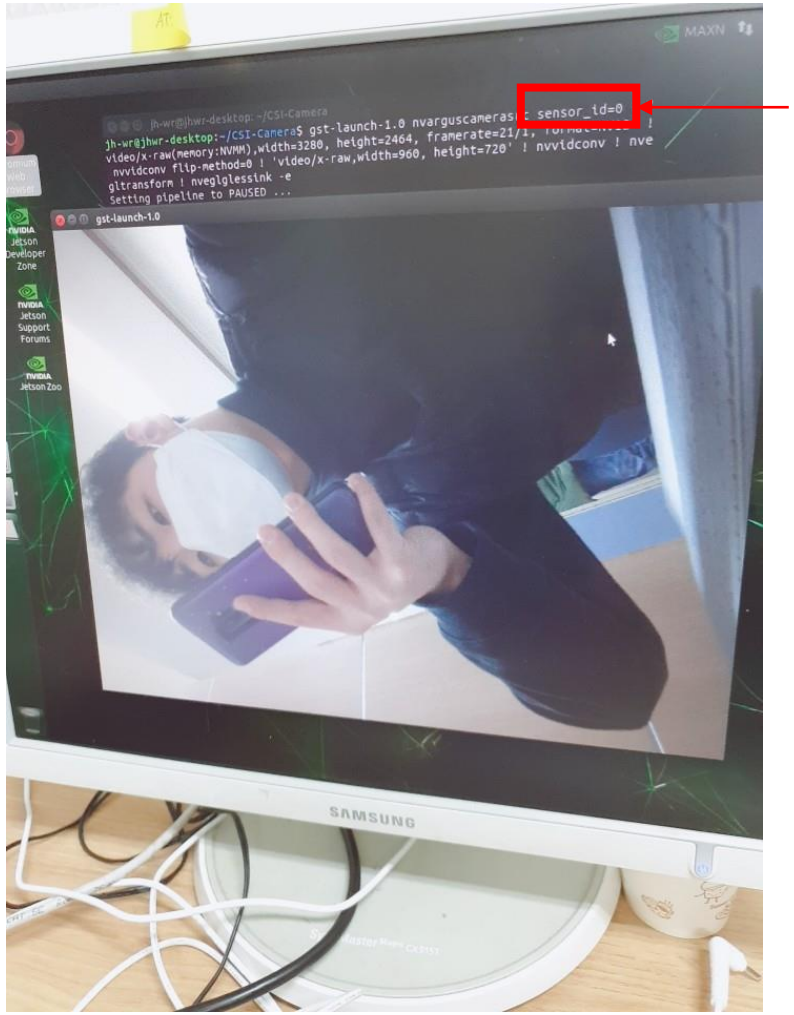


Raspberry Pi Cam을 인식하면 아래 결과를 출력

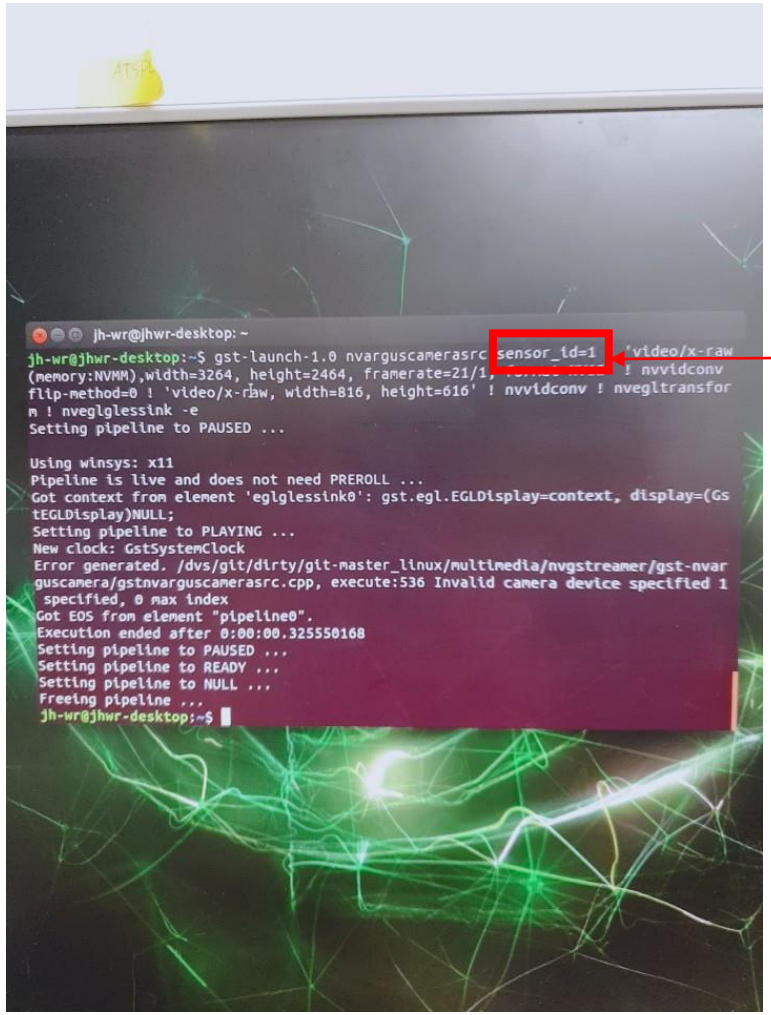


정상 출력 화면

Jetson Nano & Pi Cam 연동



Sensor_id가 일치하지 않으면 카메라 화면 출력



Sensor_id가 일치하지 않으면 카메라 화면이 출력되지 않고 오류 발생