OpenCV Python

Prebuilt Usage Manual

Version 1.4

e-con Systems

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e-con Systems

Think Camera. Think e-con.

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Contents

Introduction to OpenCV-Python

Open-Source Computer Vision Library (OpenCV) is an open source computer vision and machine learning software library. OpenCV libraries are used to communicate with Cameras. APIs introduced in the OpenCV can be supported with all e-Con systems cameras.

This document helps to run sample script to access the camera with OpenCV.

Prerequisites

The prerequisites are as follows:

Linux:

- GTK+2.x or higher, including headers (libgtk2.0-dev)
- Python 3.6.9.
- Library packages: libjpeg-dev, libpng-dev, libtiff-dev, libjasper-dev, libavcodecdev, libavformat-dev, libswscale-dev, libv4l-dev, libxvidcore-dev, libx264-dev, libgtk-3-dev, libatlas-base-dev, gfortran

Description

Linux:

The following steps have been tested on Ubuntu 20.04 and with Python 3.8.10. It relatively works on other versions of Ubuntu OS.

Windows:

The following steps have been tested on Windows 10. It relatively works on other versions of Windows OS

Using Python Binary in Windows

OpenCV for Python is a sample python script used to demonstrate some of the features of the e-con Systems cameras with OpenCV APIs.

Step 1 – Installing Python

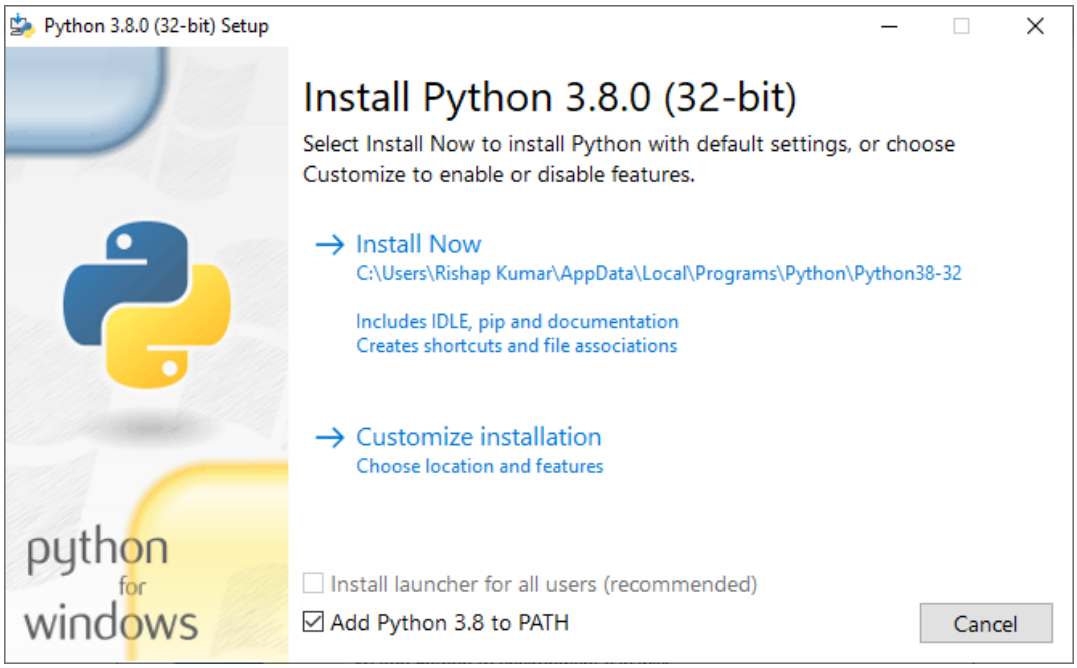
The steps to install the python in your PC as follows:

1. Installation of the python 3.8 and above:

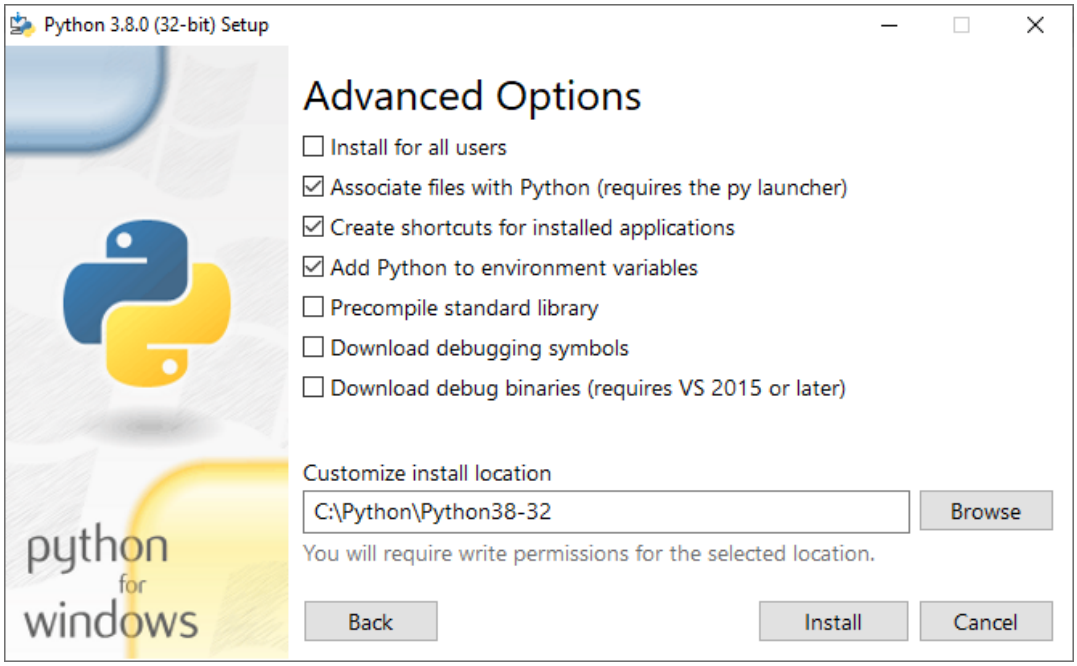
a) Download the python 3.8 installer for windows in below link https://www.python.org/downloads/release/python-380/

b) Follow the steps while installing the python installer.

I. Check the “Add Python 3.8 to PATH” option.



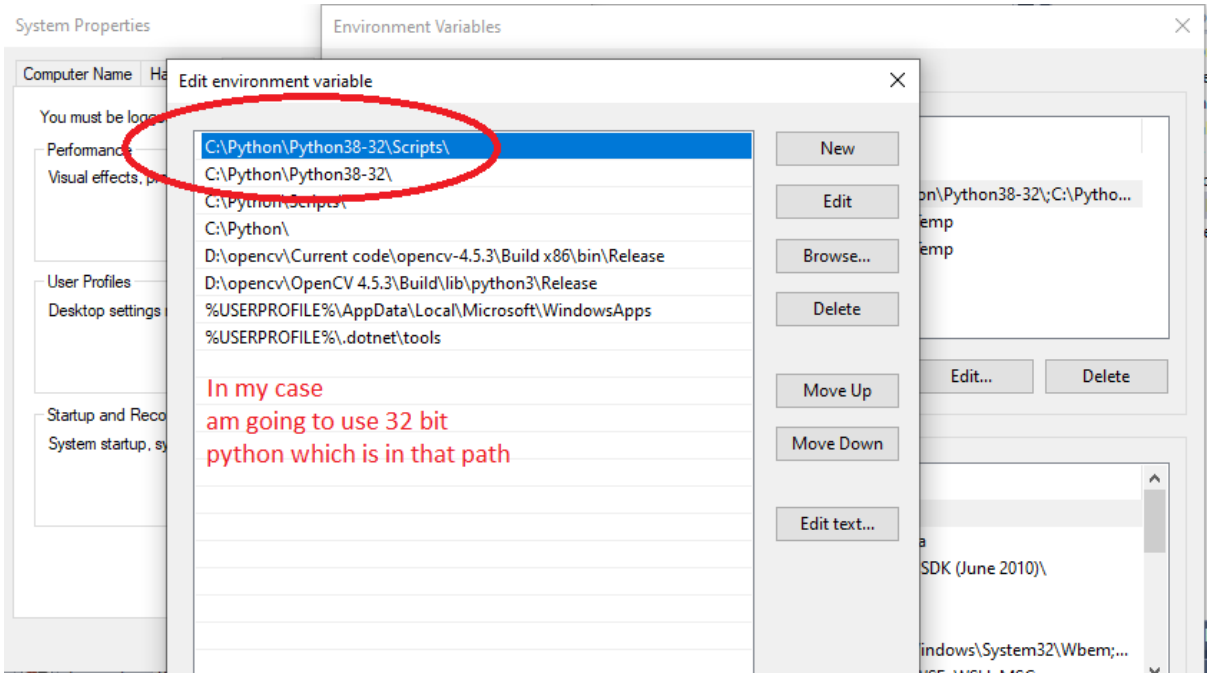
II. Click customize installation.



iii. Brows the path and click next.

2. **If Multiple Python installers (32 & 64 bit) installed:**
   a) If in your PC more python versions installed then make sure you are working python version path should be in top of the User variables.

Search for **Edit the system environment variables**
↓
Click **Environment Variables**
↓
Under **User variables**
↓
Click on **Path** and **Edit**
↓
Adjust the Paths with **Move UP or Move Down**

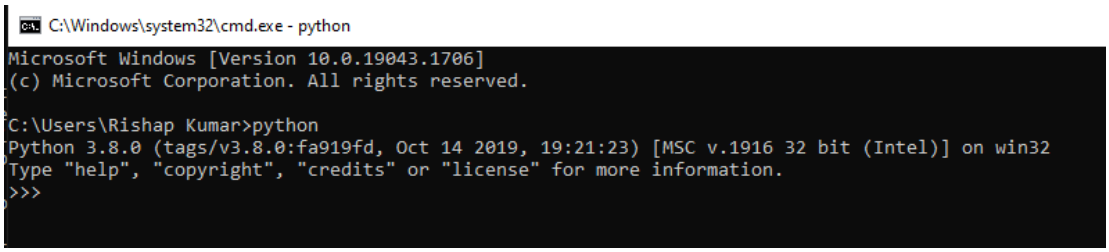


3. Install the opencv for python (cv2):

I. Open Command prompt.

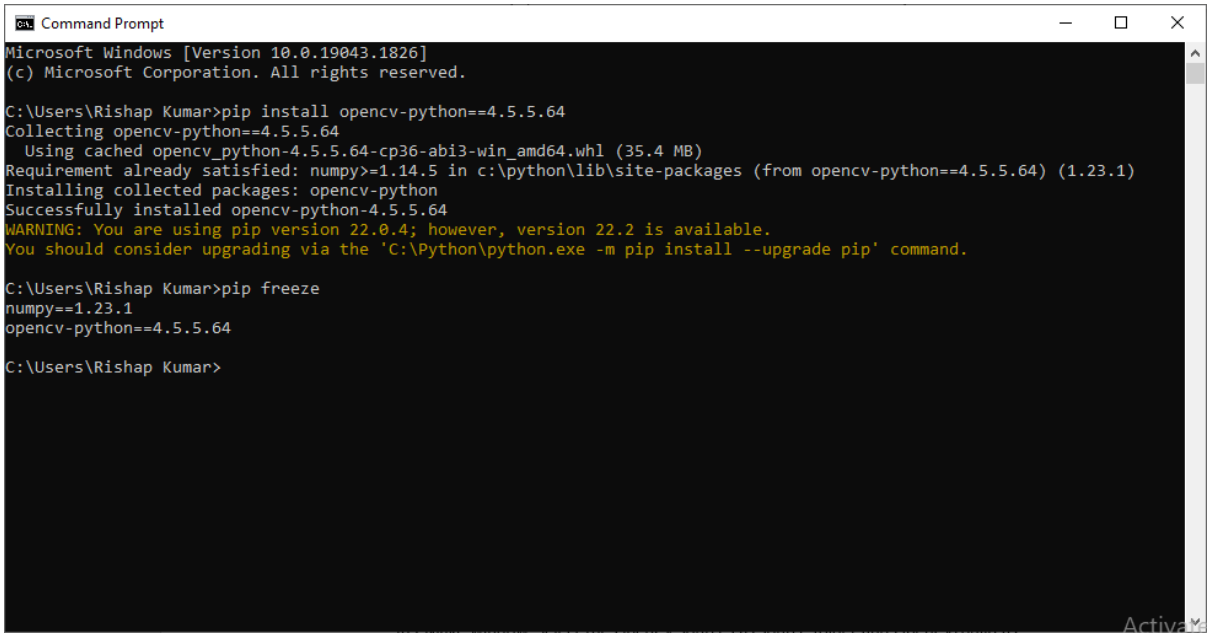
II. Type python and give enter to check the python version.

III. Make sure the installed python version is 3.8 and above.



IV. Give exit () to exit from python mode.

V. Type "**pip install opencv-python==4.6.0.66**" and click enter, it will install the opencv for python.



VI. Type python and give enter to set the python mode.

VII. Give import cv2, if this will not show any error then the opencv was successfully installed.

VIII. Type "**cv2.__version__**" it will print the installed cv2 version.

IX. It will show the latest cv2 version.

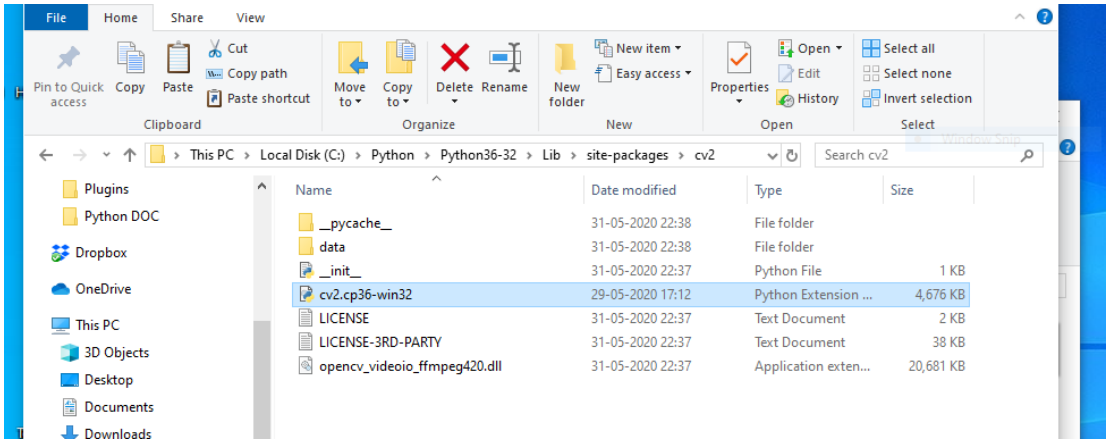
Configuration for Python

This section describes about how to Configure the python for sample python code.

1. Replacing the cv2 file (changing the cv2 version)

a) After building the opencv code for python, **cv2.cp310-win_amd64.pyd** file will generate in "OPENCV_BUILD_PATH\Lib\python3\Release\"

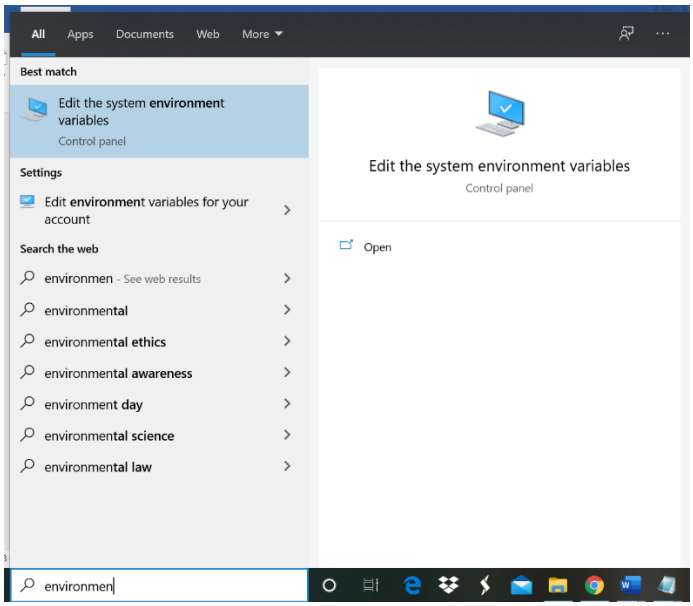
b) replace the "**cv2.pyd**" file to "PYTHON_INSTALLED_PATH\Lib\site-packages\cv2\"



2. Update System Environment Variables

1. Update environment variable – PATH

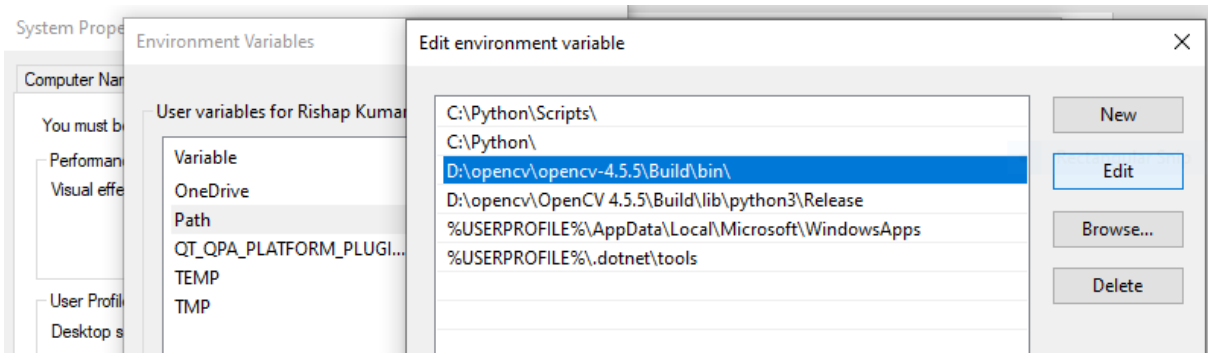
a) First of all, we will add OpenCV dll files path to our system varialbe PATH. Press Windows Super key, search for “environment variables”.



b) Click Environment Variables in System Properties window.

c) Under System Variables, Select Path and click edit.

d) Click New, and give path to **OPENCV_PATH\build\install\bin** and click Ok. Depending upon where you have kept opencv-4.6.0 folder and what version of Visual Studio you used to compile OpenCV, this path would be different.



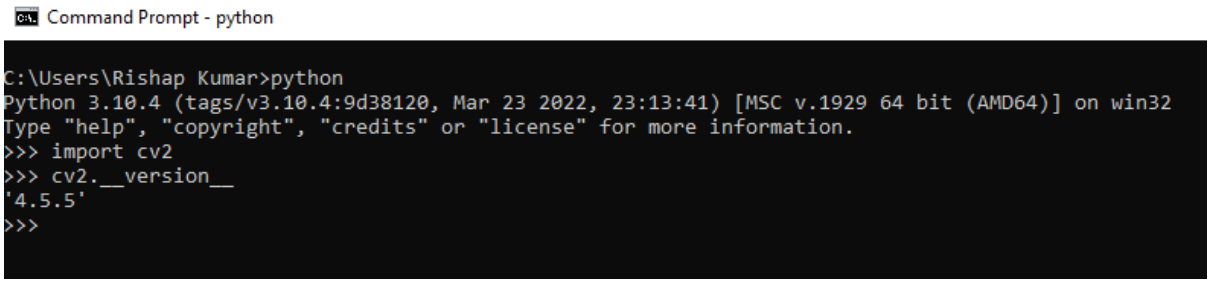
3. Check the cv2 version

a) Type python and give enter to set the python mode.

b) Give import cv2, if this will not show any error then the opencv was successfully down loaded.

c) Type "cv2.__version__" it will print the installed cv2 version

d) Make sure after replace we see the version '4.6.0'.



4. Run the Python Script

If the Device have Y8 formats, then you should register the **Y8GrabberFilter.dll,**

To Register Y8GrabberFilter.dll

i. Y8Grabber only supports Y8 formats
ii. Open the command prompt in administrator mode.
iii. Go to the Y8GrabberFilter.dll (32 or 64 bit) path (using the cd command).

iv. Register the Y8GrabberFilter.dll (with command **regsvr32 Y8GrabberFilter.dll**).

v. After clicking the enter you can see the following message box.

Open the command prompt window with script path. Run the python script with "**Python main.py**".

Using Python Binary in Linux

The OpenCV Python is a sample command line application used to demonstrate some of the features of the e-con Cameras with OpenCV APIs.

The steps to configure and the OpenCV python script as follows:

Step 1 - Installing Dependencies

The below table lists the dependencies to be installed for using OpenCV.

Dependencies	Commands
Some general development libraries	`$ sudo apt-get install build-essential make cmake cmake-qt-gui g++ unzip pkg-config`
Video4Linux Camera development libraries	`$ sudo apt-get install libv4l-dev`
OpenGL development libraries for creating graphical windows	`$ sudo apt-get install libglew-dev`
GTK development libraries for creating graphical windows	`$ sudo apt-get install libgtk-3-dev`
Udev development libraries for accessing device information	`$ sudo apt-get install libudev-dev`
Libav video input or output development libraries	`$ sudo apt-get install libavformat-dev libavutil-dev libswscale-dev libavcodec-dev libavcodec-ffmpeg-extra56 libavformat-ffmpeg56 libavutil-ffmpeg54 libswscale-ffmpeg3 libdc1394-* libjpeg-dev libpng-dev libtiff-dev libjasper-dev libxvidcore-dev libx264-dev libopencv-dev`
Eigen3 math development libraries	`$ sudo apt-get install libeigen3-dev`
Python 3 headers and libraries	`$ sudo apt-get install python3.6-dev(18.04)` `$ sudo apt-get install python3.8-dev(20.04)`
Pyudev library	`$ sudo python3 -m pip install pyudev`
Numpy library	`$sudo apt-get install python3-numpy`

In Ubuntu , the dependency libraries varies.

Based on the Ubuntu versions, the development libraries will differ, for example in ubuntu 18.04 libavcodec version will be 57. Thus, install dependencies which supports the ubuntu versions.

For 20.04 OS, extra dependencies are needed. They include: pkg-config, gfortran, openexr, libatlas-base-dev, libtbb2, libopenexr-dev, libgstreamer-plugins-base1.0-dev, libgstreamer1.0-dev

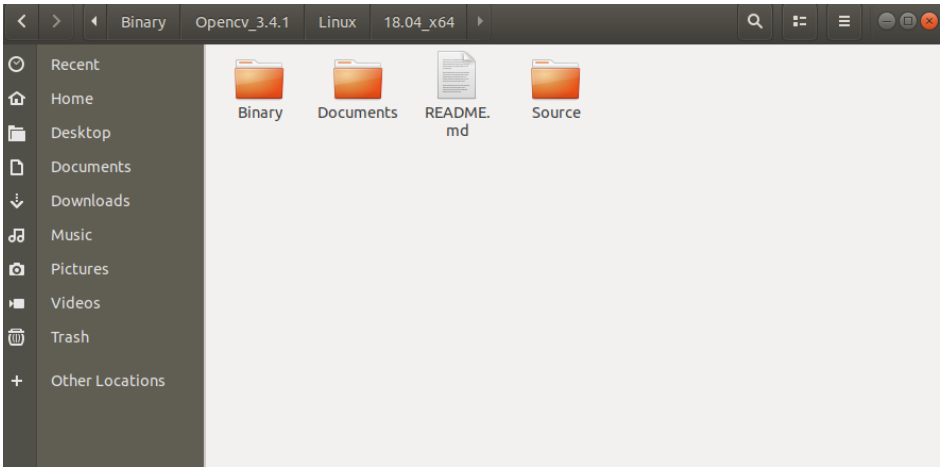
For 18.04 Os: libavcodec-extra57, pkg-config, libavformat57, libavutil55

Install the opencv for python:

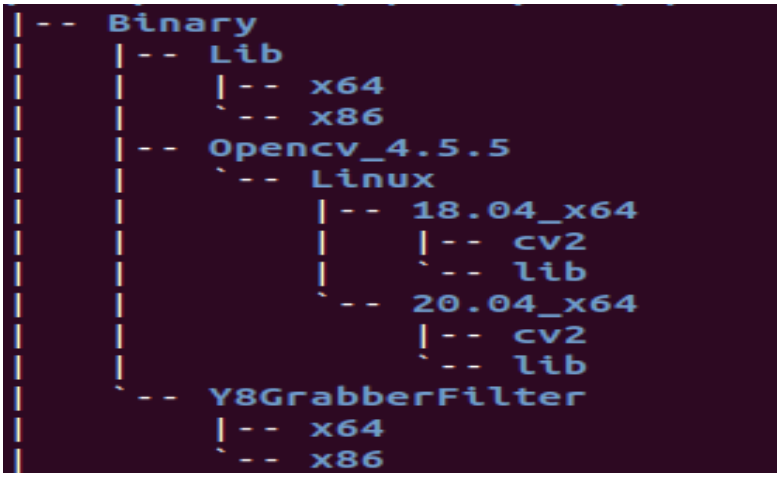
I. Open Command prompt.
II. Type python3 -V and give enter to check the python version.
III. Make sure the installed python version is 3.6.9(in 18.04) or 3.8.10(in 20.04).
IV. Give quit() to exit from python mode.
V. Type "**pip3 install opencv-python**" and click enter, it will install the opencv for python.
VI. Type python and give enter to set the python mode.
VII. Give import cv2, if this will not show any error then the opencv was successfully installed.
VIII. Type "**cv2.__version__**" it will print the installed cv2 version.
IX. It will show the latest cv2 version.

Step 2 – Understanding Package structure

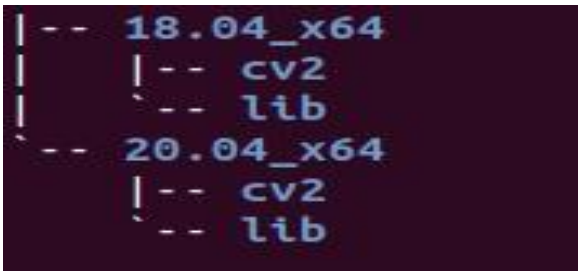
- Understanding directory layout of Package (pic shown below).



• *Binary Directory Structure*



- Navigate to directory according to the OpenCV version required.



Linux Directory Structure

- Choose the directory according to the current OS present.

(Note: Example Image shown is for OpenCV4.6.0/Linux/64-bit/<18.04 or 20.04>)

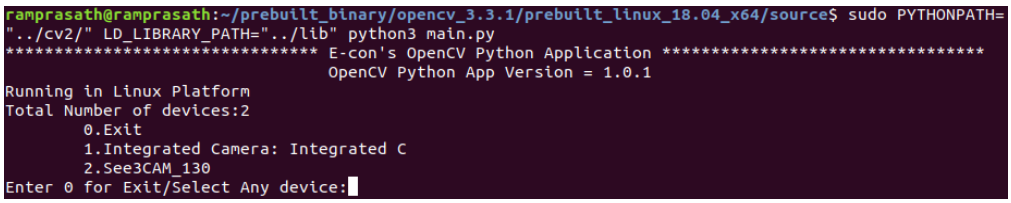
- Cv2 folder contains python dependencies, lib contains opencv libraries.

Step 3 – Run the Python Script

1. Note the path of cv2, lib folder as shown in above section.
2. Go to Source/PythonScript/
3. Open terminal and run the following command to run the sample code.

```
$ sudo PYTHONPATH="@path/cv2/" LD_LIBRARY_PATH="@path/lib"
python3 main.py
```

The devices connected to the PC will be displayed as below shown.



Troubleshooting

In this section, you can view the list of commonly occurring issues and their troubleshooting steps.

Linux:

Error loading libopencv_world.so

Run the following command (in order to take prebuilt lib path should be specified).

```
sudo LD_LIBRARY_PATH=<path_to_the_libopencv_world.so>
python3 main.py
```

Instead, if you wish to add the path to libopencv_world.so, permanently to the library path. Go to /etc/ld.so.conf.d/. Create a config file named opencv.conf, mention the path inside the config file and give the command:

```
$ sudo ldconfig
```

ModuleNotFoundError: No module named 'cv2'

path to cv2 folder is wrong or corrupted file

Support

Contact Us

If you need any support on OpenCV-Python application, 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.econsystems.com/warranty.asp

Revision History

Rev	Date	Description	Author
1.0	13-August-2020	Initial Draft	Murali Mohan M
1.1	14-August-2020	Added changes.	Murali Mohan M
1.2	09-February-2021	Added Y8 Grabber Register steps.	Murali Mohan M
1.3	29-July-2022	Updated document for 4.5.5 version	Nivedha Janarthanan
1.4	14-September-2023	Updated document for 4.6.0 version	Sushanth S