OpenCV Python

Prebuilt Usage Manual

e-con Systems

Your Product Development Partner

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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(Ubuntu 18.04) or Python 3.8(Ubuntu 20.04).

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/

      Note:- Download installer Platform (Win32 or x64) based on your requirement. If we installed Python in Win32 platform, we could build OpenCV in Win32 platform only and same as for x64 platform.

   b) Follow the steps while installing the python installer.
      I. Check the "Add Python 3.8 to PATH" option.
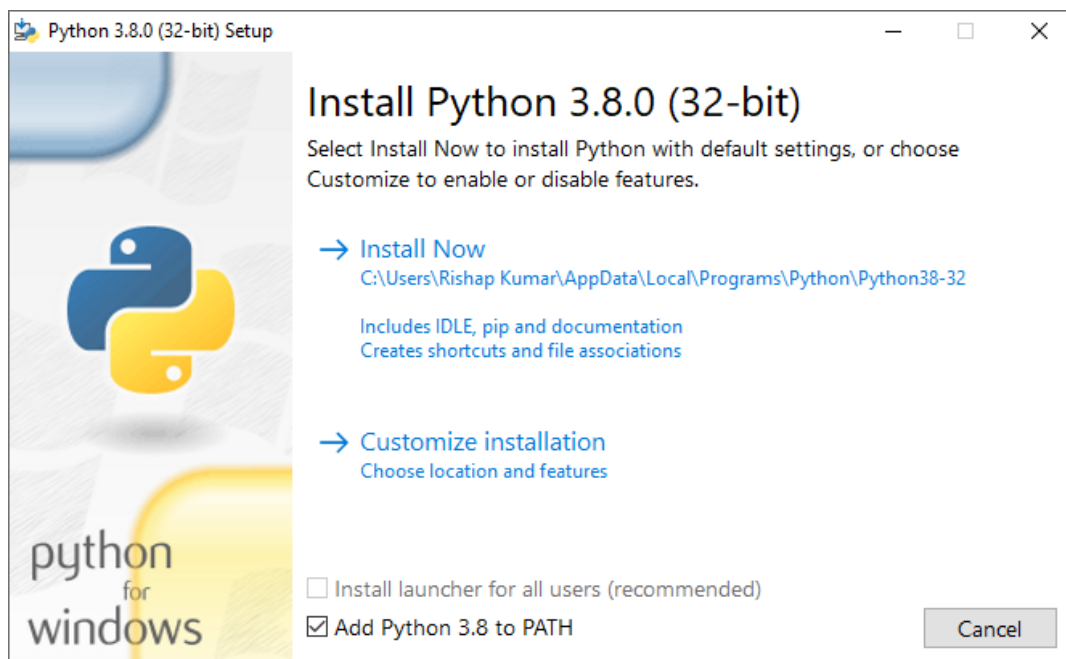
      II. Click customize installation.
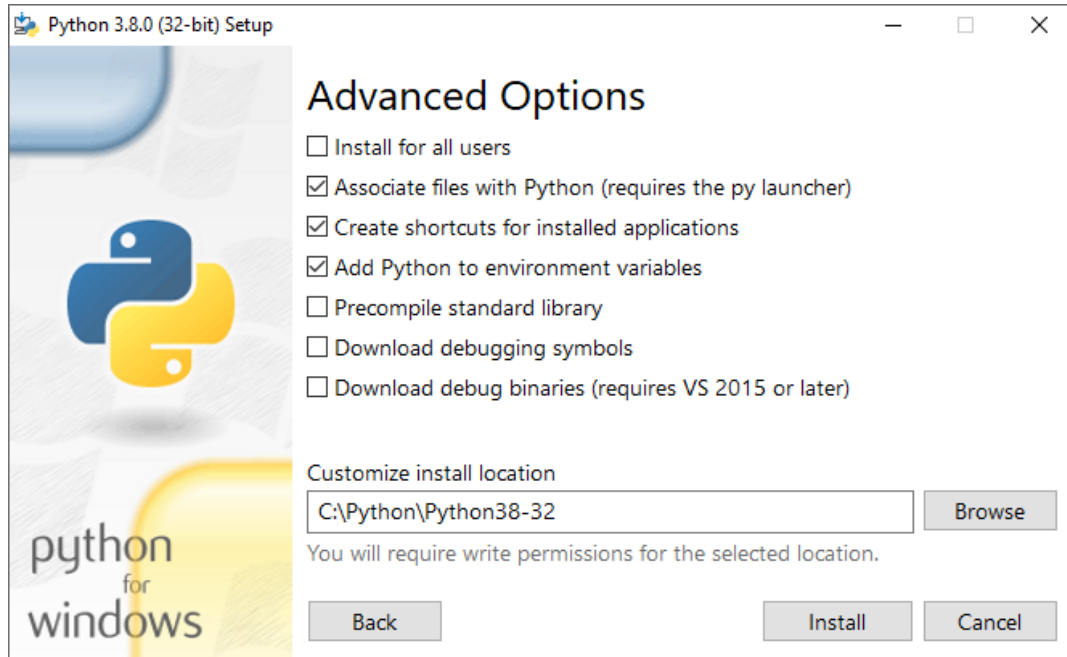
III. Brows the path and click next.

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**

5
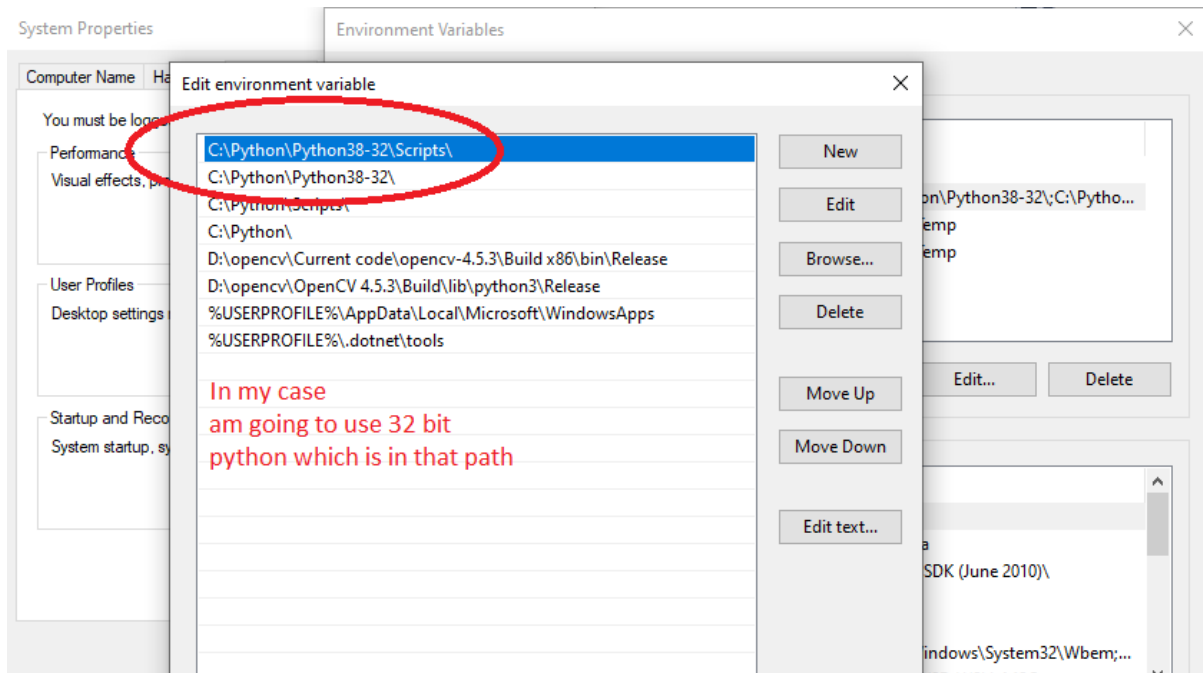
3. Install the opencv for python (cv2):

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==4.5.5.64**" and click enter, it will install the opencv for python.

```
Command Prompt                                                                    —    □    ×

Microsoft Windows [Version 10.0.19043.1826]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Rishap Kumar>pip install opencv-python==4.5.5.64
Collecting opencv-python==4.5.5.64
  Using cached opencv_python-4.5.5.64-cp36-abi3-win_amd64.whl (35.4 MB)
Requirement already satisfied: numpy>=1.14.5 in c:\python\lib\site-packages (from opencv-python==4.5.5.64) (1.23.1)
Installing collected packages: opencv-python
Successfully installed opencv-python-4.5.5.64
WARNING: You are using pip version 22.0.4; however, version 22.2 is available.
You should consider upgrading via the 'C:\Python\python.exe -m pip install --upgrade pip' command.

C:\Users\Rishap Kumar>pip freeze
numpy==1.23.1
opencv-python==4.5.5.64

C:\Users\Rishap Kumar>
```

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\"
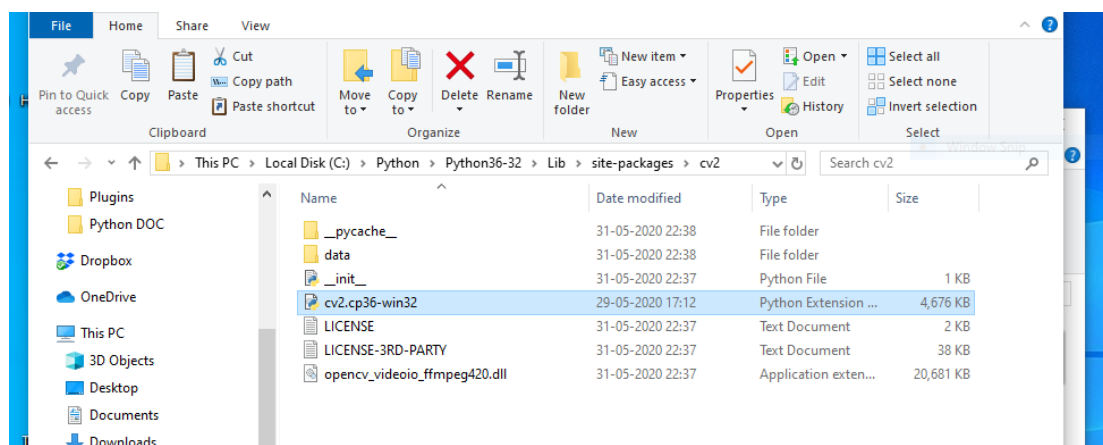
2. Update System Environment Variables

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".

OpenCV Python Prebuilt Usage Manual
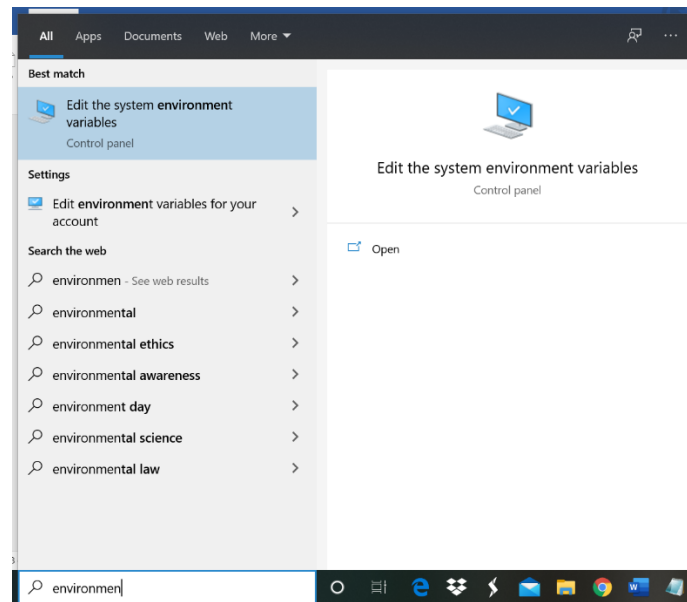
b) Click Environment Variables in System Properties window.

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

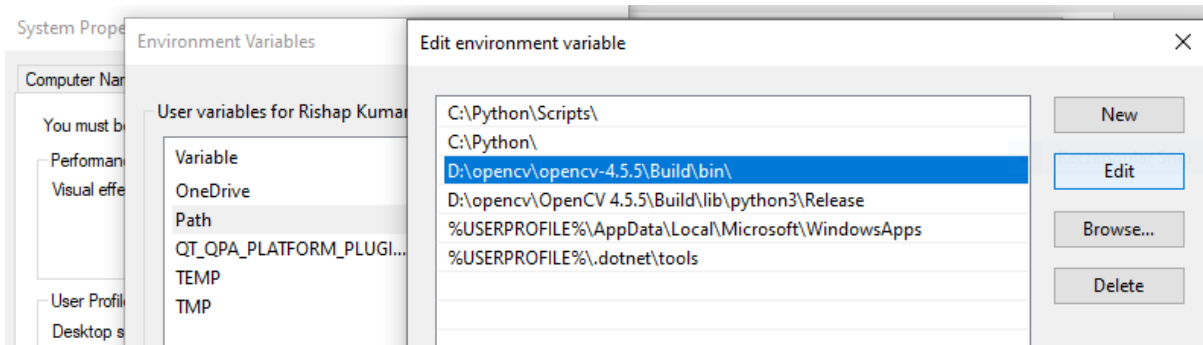d) Click New, and give path to **OPENCV_PATH\build\install\bin** and click Ok. Depending upon where you have kept opencv-4.5.5 folder and what version of Visual Studio you used to compile OpenCV, this path would be different.

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 '4.5.5'.

Command Prompt - python

```
C:\Users\Rishap Kumar>python
Python 3.10.4 (tags/v3.10.4:9d38120, Mar 23 2022, 23:13:41) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import cv2
>>> cv2.__version__
'4.5.5'
>>>
```

4. Adding eCAMFWSW file

Add runtime libraries path to the sample application

1. Update environment variable – PATH

e) Add eCAMFwSw dll files path to our system varialbe PATH. Press
Windows Super key, search for "environment variables".
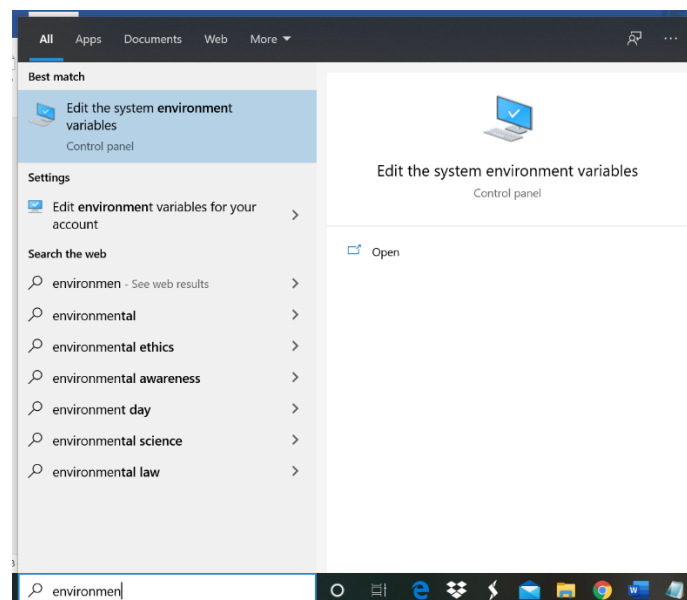
f) Click Environment Variables in System Properties window.

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

h) Click New, and give path to **eCAMFwSw_PATH** and click Ok. Depending
upon where you have kept eCAMFwSw.dll folder
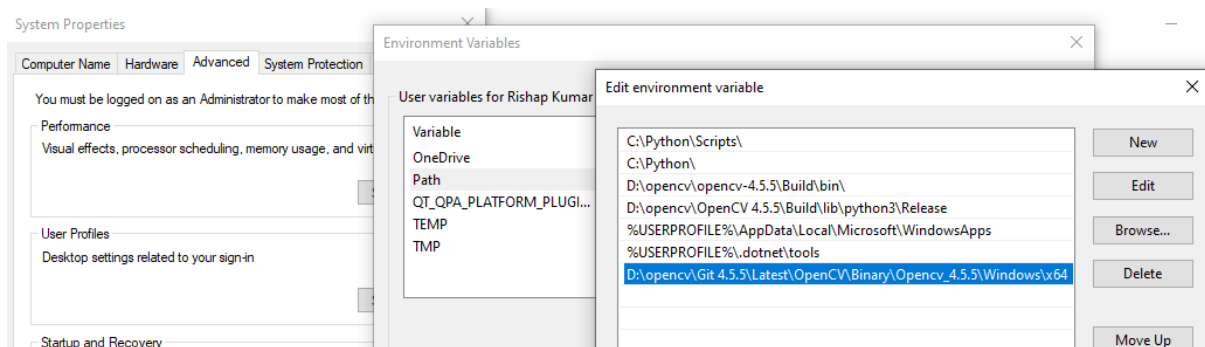
5. Run the Python Script

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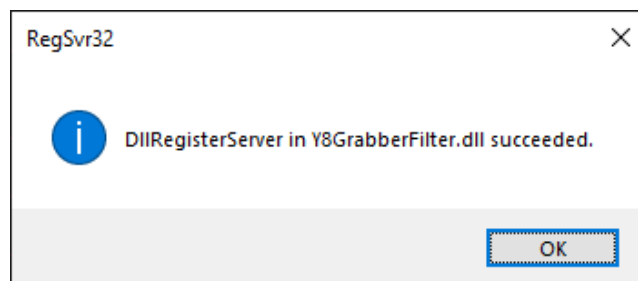
Open the command prompt window with script path. Run the python script with "**Python main.py**".

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.

In Ubuntu , the dependency libraries varies.

Based on the Ubuntu versions, the development libraries will differ. Thus, install dependencies which supports the ubuntu versions.

For 18.04, the libraries include: libdc1394-22, libavcodec57, libavcodec-extra, libavcodec-extra57, libavformat57, libswscale4

For 20.04, the libraries include: libopenexr24, libhdf5-103, libdc1394-22, libavcodec58, libavformat58, libswscale5

After that, install **pyudev** and **numpy** libraries with command:

sudo python3 -m pip install pyudev

sudo apt-get install python3-numpy

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).
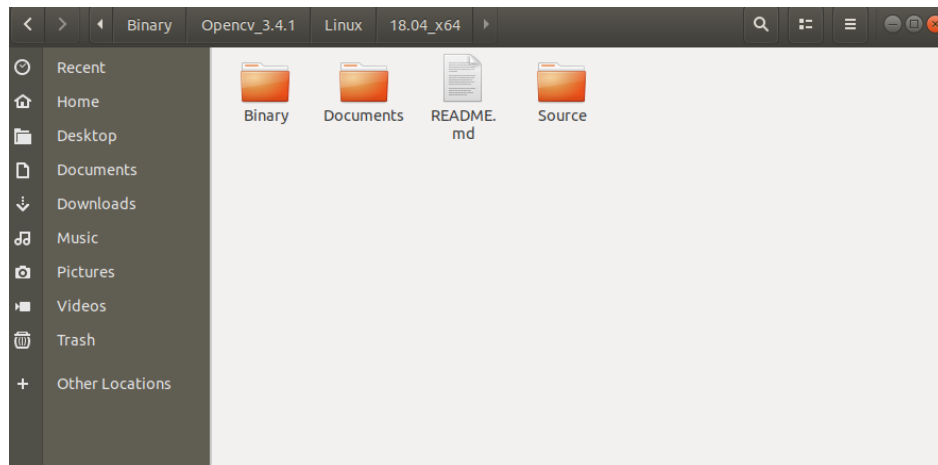
- *Binary Directory Structure*


```
|-- Binary
|     |-- Lib
|     |     |-- x64
|     |     `-- x86
|     |-- Opencv_4.5.5
|     |     `-- Linux
|     |           |-- 18.04_x64
|     |           |     |-- cv2
|     |           |     `-- lib
|     |           `-- 20.04_x64
|     |                 |-- cv2
|     |                 `-- lib
|     `-- Y8GrabberFilter
|           |-- x64
|           `-- x86
```

- Navigate to directory according to the OpenCV version required.


```
|-- 18.04_x64
|     |-- cv2
|     `-- lib
`-- 20.04_x64
      |-- cv2
      `-- lib
```

Linux Directory Structure

- Choose the directory according to the current OS present.
(Note: Example Image shown is for OpenCV4.5.5/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.

```
ramprasath@ramprasath:~/prebuilt_binary/opencv_3.3.1/prebuilt_linux_18.04_x64/source$ sudo PYTHONPATH=
"../cv2/" LD_LIBRARY_PATH="../lib" python3 main.py
****************************** E-con's OpenCV Python Application ********************************
                              OpenCV Python App Version = 1.0.1
Running in Linux Platform
Total Number of devices:2
        0.Exit
        1.Integrated Camera: Integrated C
        2.See3CAM_130
Enter 0 for Exit/Select Any device:
```

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

Steps to be followed for installing pip and opencv-python if default command fails:

sudo apt install python3-pip

pip3 install scikit-build

pip3 install --upgrade pip setuptools wheel

pip3 install opencv-python

ImportError: cannot import name 'collections_abc' while installing opencv-pthon:

pip3 install --upgrade six

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