# Qt Development Documentation

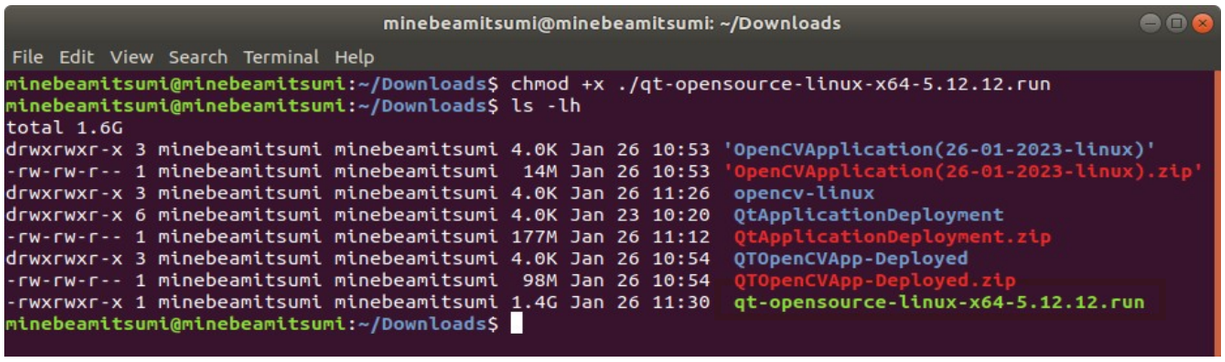
**Opencv Ubuntu setup guide:**
https://docs.opencv.org/3.4.2/d7/d9f/tutorial_linux_install.html – the guide used in project.

**Qt Creator:**
Link: https://download.qt.io/archive/qt/5.12/5.12.12/

| Name | Last modified | Size | Metadata |
|---|---|---|---|
| Parent Directory | | - | |
| submodules/ | 25-Nov-2021 08:09 | - | |
| single/ | 25-Nov-2021 08:08 | - | |
| qt-opensource-windows-x86-5.12.12.exe | 25-Nov-2021 08:12 | 3.7G | Details |
| qt-opensource-mac-x64-5.12.12.dmg | 25-Nov-2021 08:11 | 2.7G | Details |
| qt-opensource-linux-x64-5.12.12.run | 25-Nov-2021 08:10 | 1.3G | Details |
| md5sums.txt | 25-Nov-2021 08:18 | 210 | Details |

After downloading **qt-opensource-linux-x64-5.12.12.run,** open terminal and run command:

**chmod +x  qt-opensource-linux-x64-5.12.12.run**




*Note: Color green font indicates executable file.*

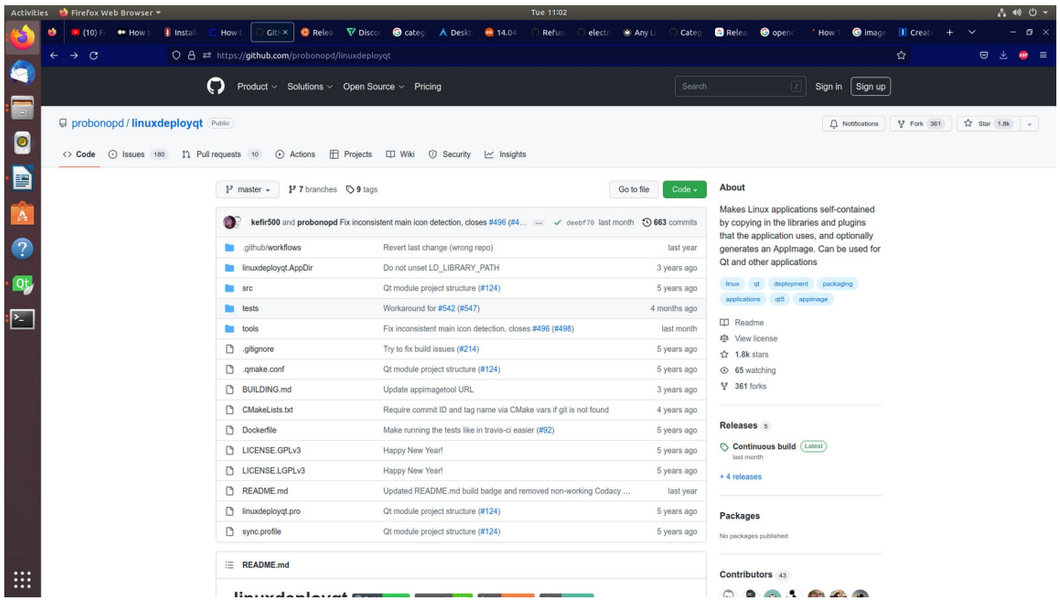
Link opencv to Qt Creator. Modify .pro file from your Qt Project

```
58
59 ############ include path for Linux environment ############
60 INCLUDEPATH += .
61 INCLUDEPATH += -I/usr/local/include/opencv4
62 LIBS += -L/usr/local/lib \
63      -lopencv_calib3d \
64      -lopencv_core \
65      -lopencv_features2d \
66      -lopencv_flann \
67      -lopencv_highgui \
68      -lopencv_imgproc \
69      -lopencv_ml \
70      -lopencv_objdetect \
71      -lopencv_photo \
72      -lopencv_stitching \
73      -lopencv_videoio \
74
```

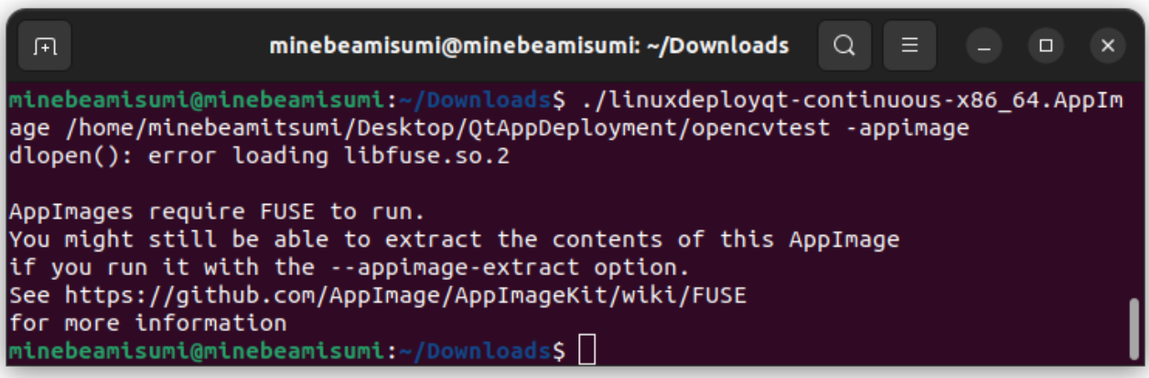
# Qt Application Deployment on Linux Environment

**Guide:**
**https://medium.com/swlh/how-to-deploy-your-qt-applications-to-linux-operating-system-with-linuxdeployqt-3c004a43c67a**

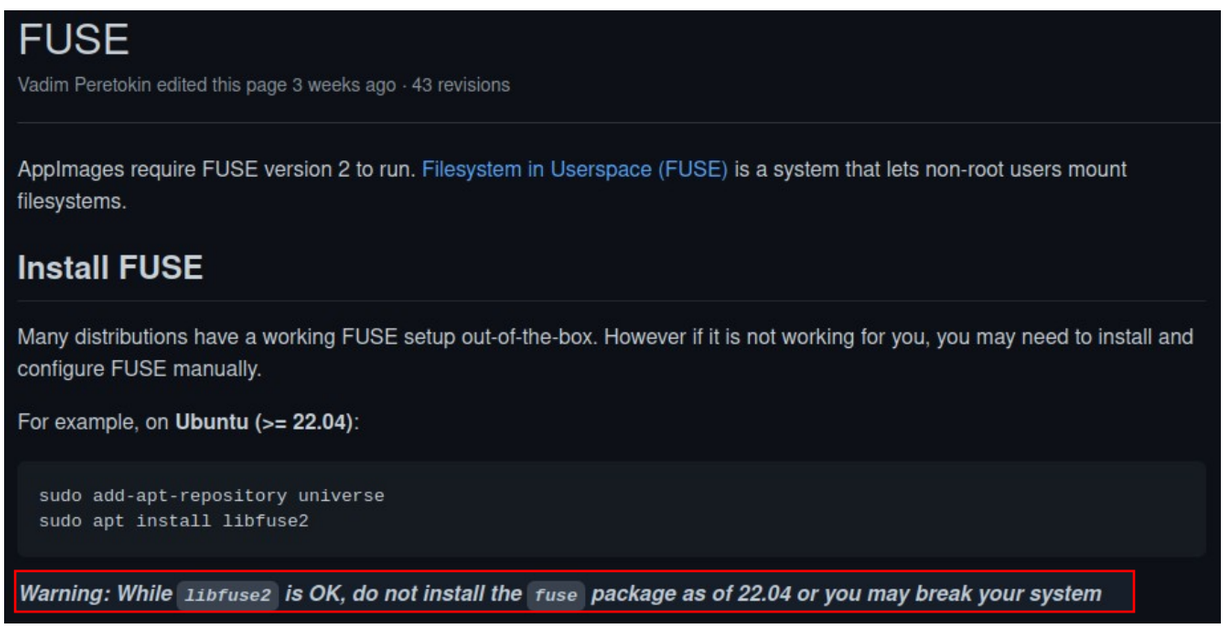
**Download linuxdeployqt: https://github.com/probonopd/linuxdeployqt**
Read **Documentation** before doing the process.

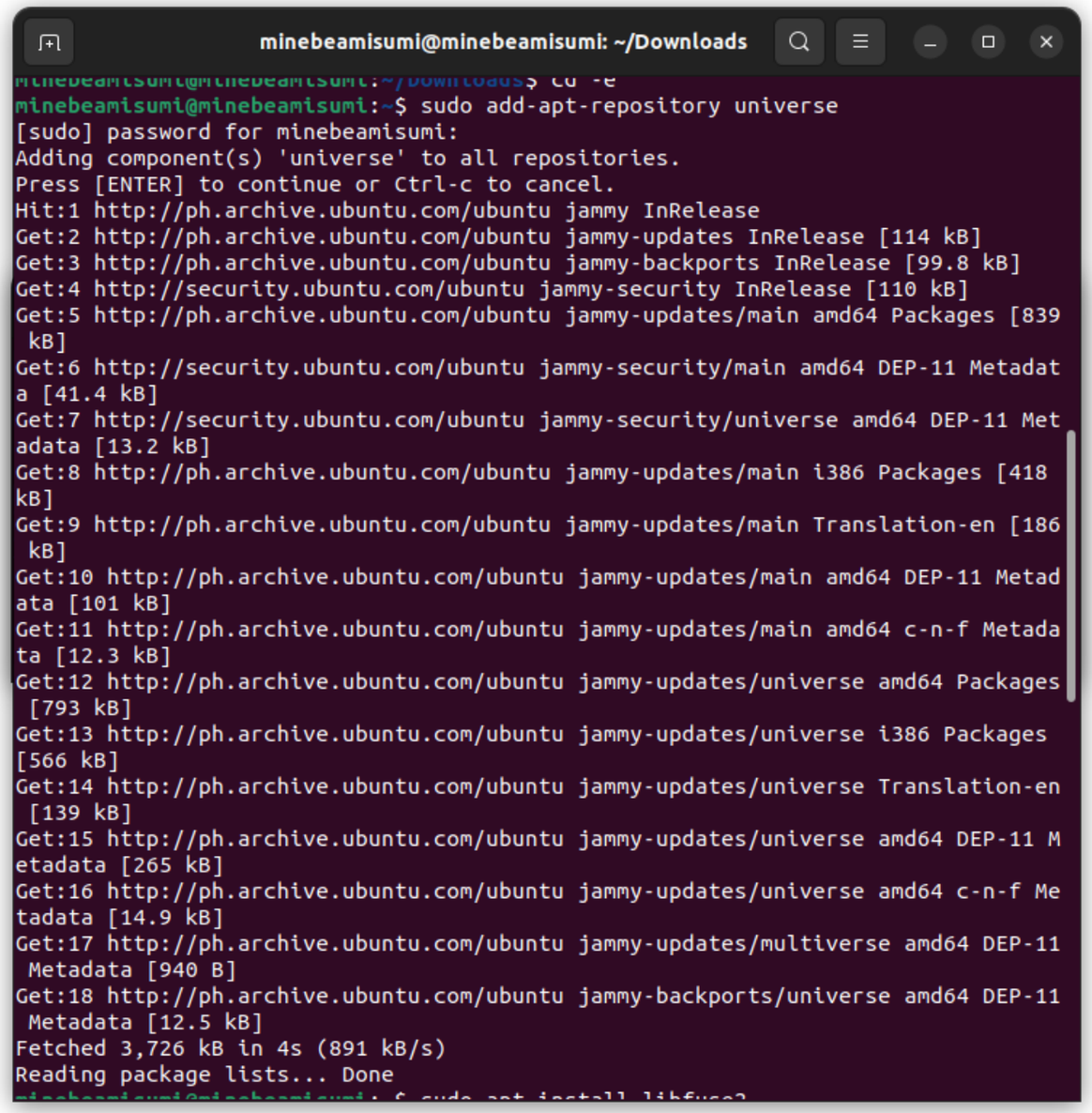


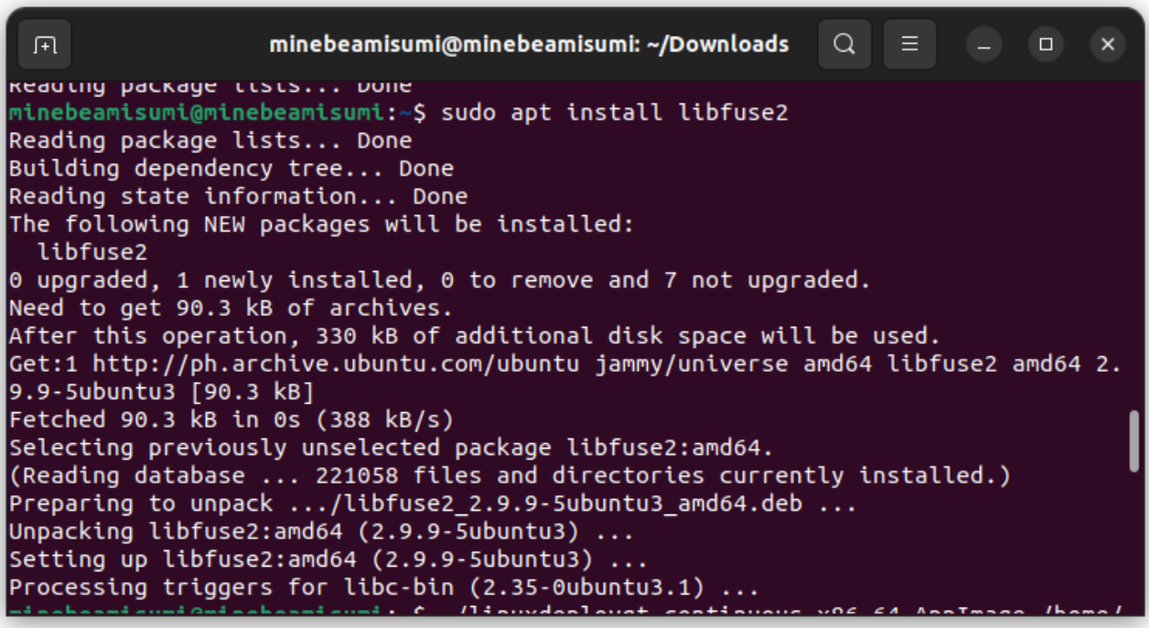

## For Ubuntu 22.04




**Download FUSE: https://github.com/AppImage/AppImageKit/wiki/FUSE**



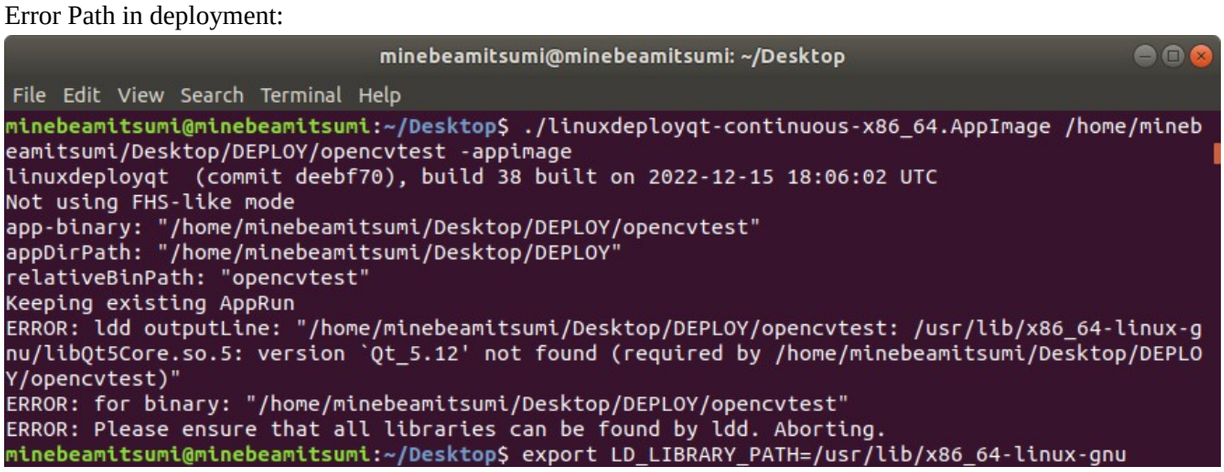



*Due to warning note and compatibility, the deployment of the app is decided to deploy on the lower version of Ubuntu since the deployment on lower version last time is successfull.*

**UBUNTU 18.04**

Error Path in deployment:




*Run command:*
*My custom path (export PATH=/home/minebeamitsumi/Qt5.12.12/5.12.12/gcc_64/bin/:$PATH)*

***OUTPUT:***

*minebeamitsumi@minebeamitsumi:~/Desktop$ ./linuxdeployqt-continuous-x86_64.AppImage*
*/home/minebeamitsumi/Desktop/DEPLOY/opencvtest -appimage*
*linuxdeployqt  (commit deebf70), build 38 built on 2022-12-15 18:06:02 UTC*
*Not using FHS-like mode*
*app-binary: "/home/minebeamitsumi/Desktop/DEPLOY/opencvtest"*
*appDirPath: "/home/minebeamitsumi/Desktop/DEPLOY"*
*relativeBinPath: "opencvtest"*
*Keeping existing AppRun*
*WARNING: "/home/minebeamitsumi/Desktop/DEPLOY/qt.conf" already exists, will not overwrite.*
*ERROR: lconvert not found at "/tmp/.mount_linuxdjOKRUX/usr/bin/lconvert"*
*ERROR: Failed to copy translations*
*appimagetool, continuous build (commit 8bbf694), build <local dev build> built on 2020-12-31 11:48:33 UTC*
*fatal: not a git repository (or any of the parent directories): .git*
*Failed to run 'git rev-parse --short HEAD: Child process exited with code 128 (code 128)*
*Desktop file: /home/minebeamitsumi/Desktop/DEPLOY/desktop.desktop*
*Name: OpenCVApplication*
*Icon: icon*
*Exec: OpenCVApp*
*Comment: Qt Application Deployment*
*Type: Application*
*Categories: Development;*
*/home/minebeamitsumi/Desktop/DEPLOY/lib/libQt5Quick.so.5 used for determining architecture x86_64*
*/home/minebeamitsumi/Desktop/DEPLOY/lib/libdatrie.so.1 used for determining architecture x86_64*
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*/home/minebeamitsumi/Desktop/DEPLOY/lib/libpangoft2-1.0.so.0 used for determining architecture x86_64*
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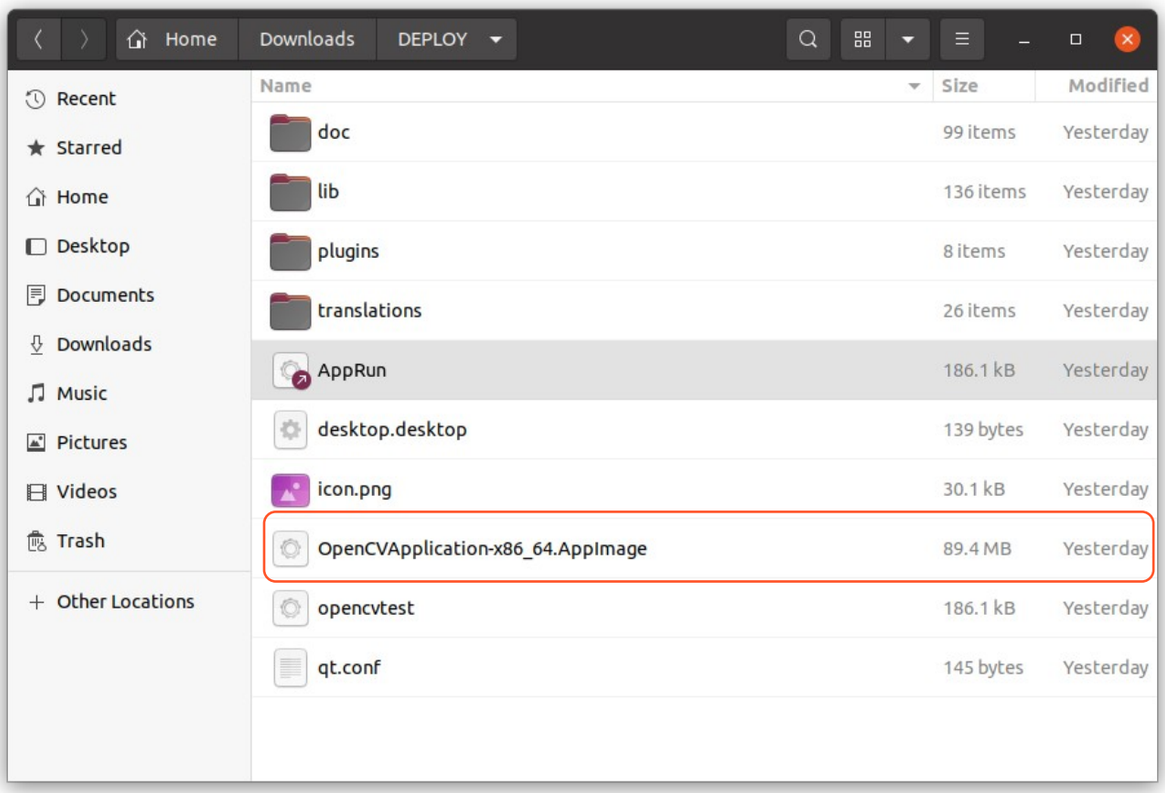
*/home/minebeamitsumi/Desktop/DEPLOY/plugins/audio/libqtmedia_pulse.so used for determining architecture x86_64*
*Using architecture x86_64*
*App name for filename: OpenCVApplication*
*/home/minebeamitsumi/Desktop/DEPLOY should be packaged as OpenCVApplication-x86_64.AppImage*
*Generating squashfs...*
*Size of the embedded runtime: 189632 bytes*
*mksquashfs commandline: /tmp/.mount_linuxdjOKRUX/usr/bin/../lib/appimagekit/mksquashfs*
*/home/minebeamitsumi/Desktop/DEPLOY OpenCVApplication-x86_64.AppImage -offset 189632 -comp gzip -root-owned -noappend -mkfs-time 0*
*Parallel mksquashfs: Using 4 processors*
*Creating 4.0 filesystem on OpenCVApplication-x86_64.AppImage, block size 131072.*
*[============================================================|] 2631/2631 100%*

*Exportable Squashfs 4.0 filesystem, gzip compressed, data block size 131072*
*compressed data, compressed metadata, compressed fragments,*

*compressed xattrs, compressed ids*
*duplicates are removed*
*Filesystem size 173864.40 Kbytes (169.79 Mbytes)*
*55.73% of uncompressed filesystem size (311974.25 Kbytes)*
*Inode table size 10828 bytes (10.57 Kbytes)*
*46.87% of uncompressed inode table size (23100 bytes)*
*Directory table size 3946 bytes (3.85 Kbytes)*
*39.87% of uncompressed directory table size (9898 bytes)*
*Number of duplicate files found 22*
*Number of inodes 414*
*Number of files 296*
*Number of fragments 45*
*Number of symbolic links 2*
*Number of device nodes 0*
*Number of fifo nodes 0*
*Number of socket nodes 0*
*Number of directories 116*
*Number of ids (unique uids + gids) 1*
*Number of uids 1*
*root (0)*
*Number of gids 1*
*root (0)*
*Embedding ELF...*
*Marking the AppImage as executable...*
*Embedding MD5 digest*
*Success*

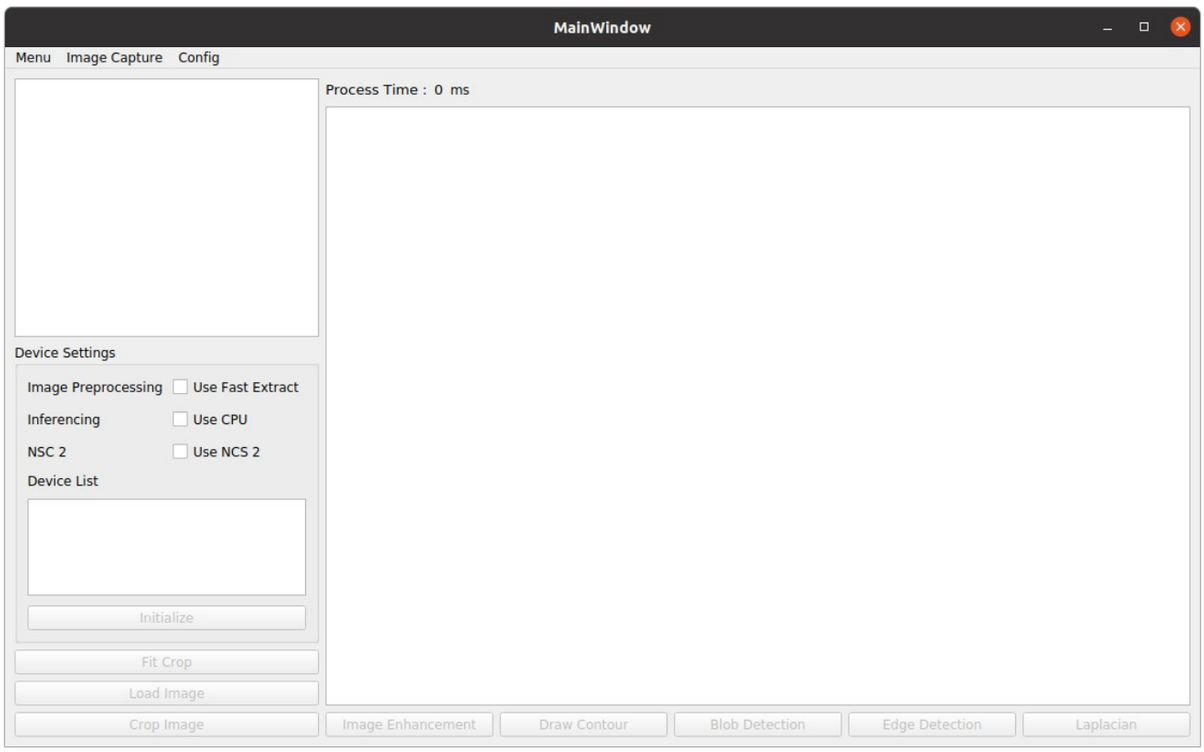
*Please consider submitting your AppImage to AppImageHub, the crowd-sourced central directory of available AppImages, by opening a pull request at https://github.com/AppImage/appimage.github.io*
*minebeamitsumi@minebeamitsumi:~/Desktop$*




The DEPLOY folder shows the AppImage Bundle

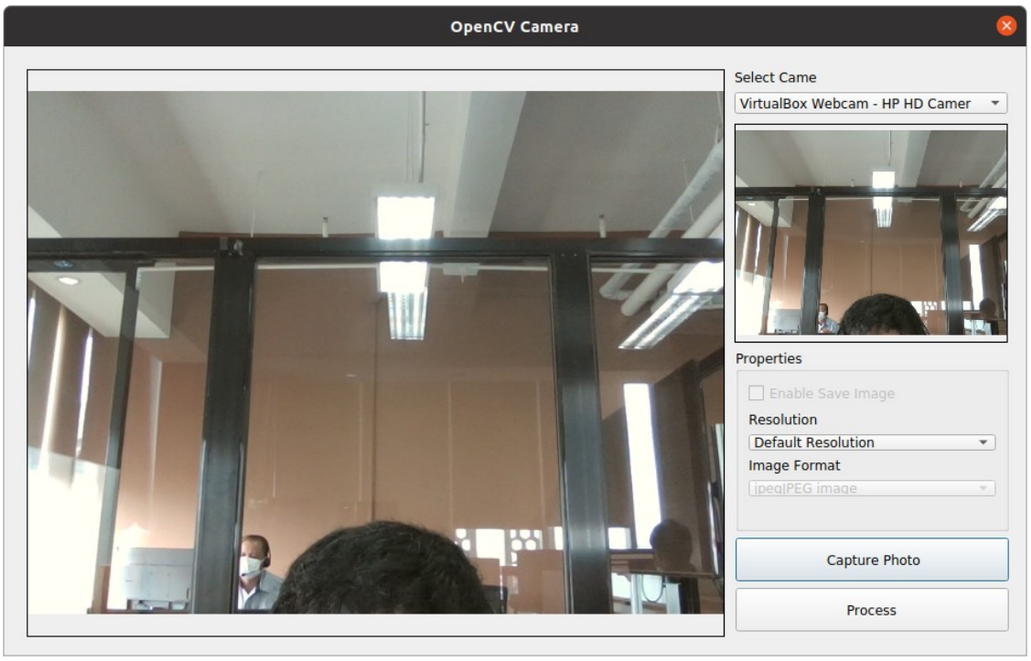
**UBUNTU 20.04**

**MainWindow UI:**




**Menu:**

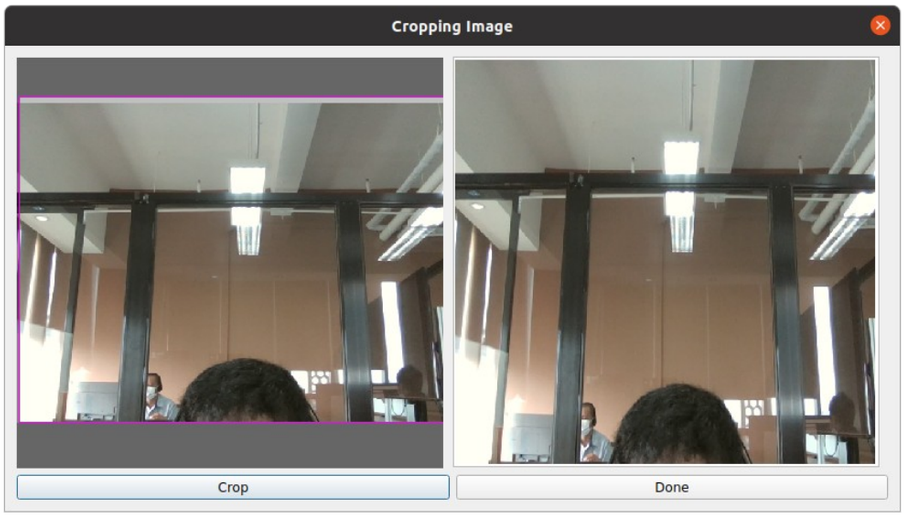
- Menu – no functions made
- Image Capture – enable camera feed UI and display camera devices



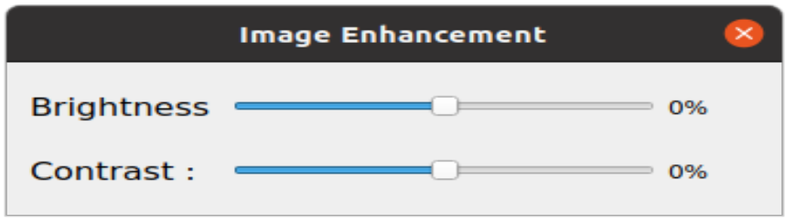

- Config – configure custom image processing (disabled functions)

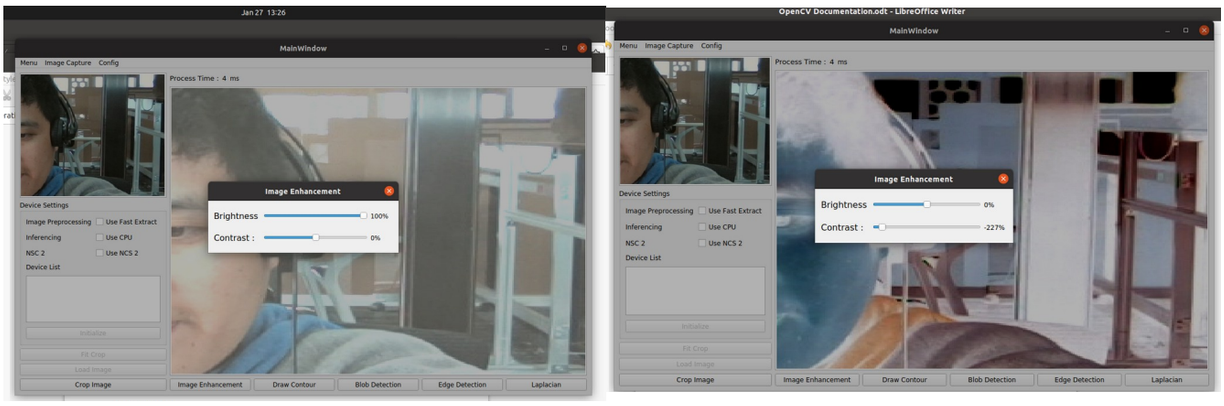
**Buttons:**

- Crop Image

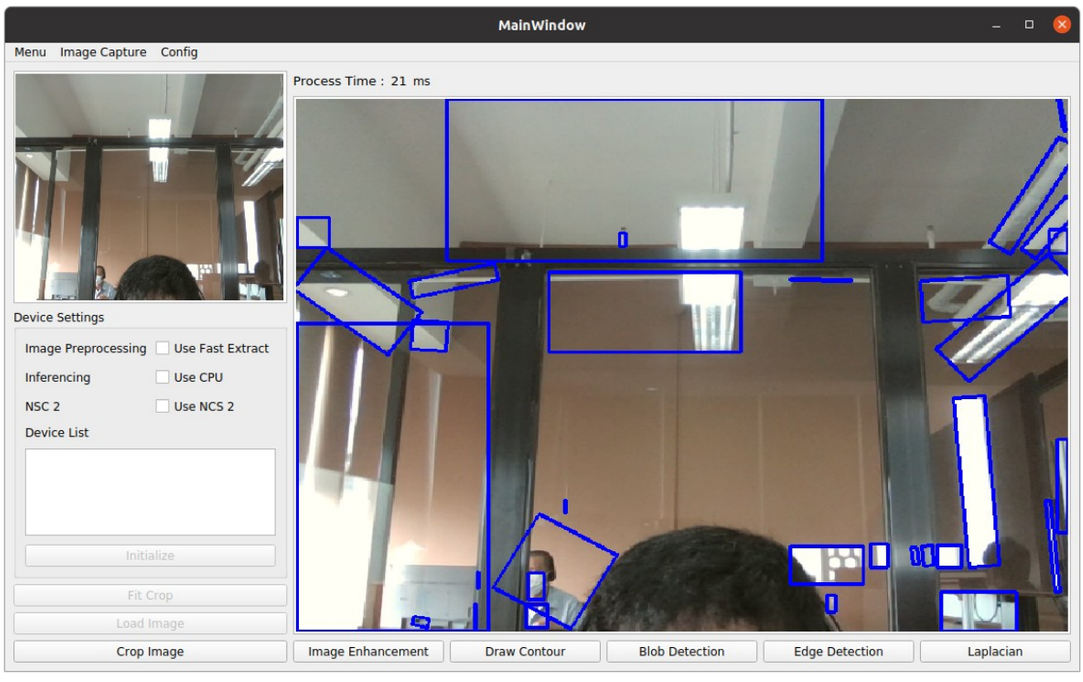



- Image Enhancement

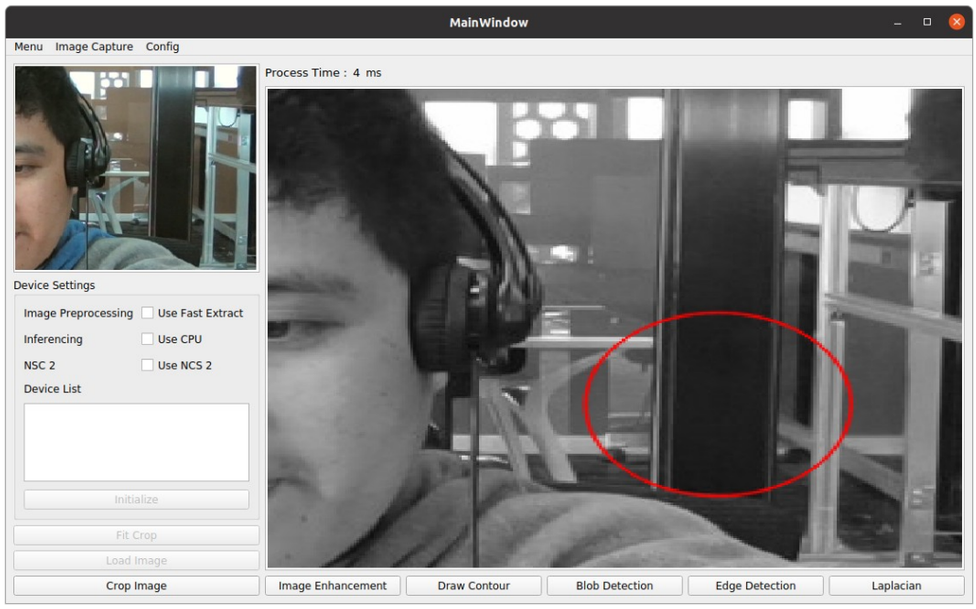


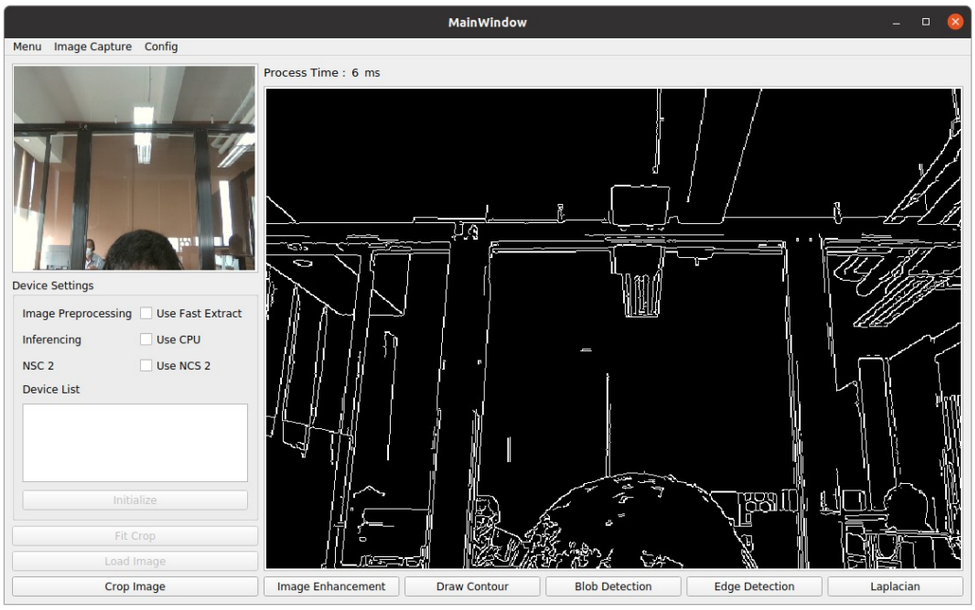

- Draw Contour



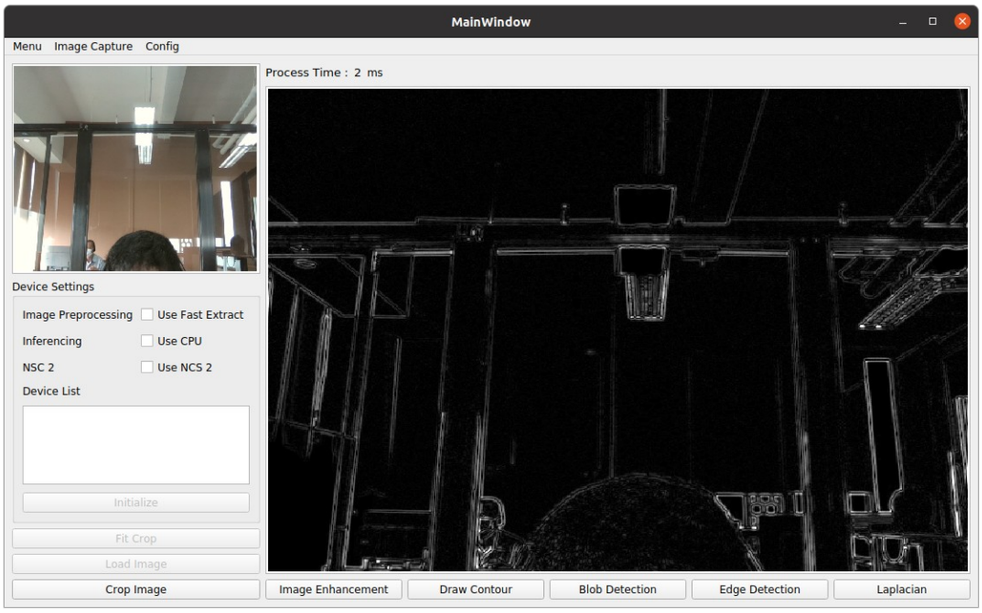
- Blob Detection




- Edge Detection




- Laplacian



**Note:** Upon testing the deployed app that we created using the ubuntu environment on Rasberry Pi, it turns out unrunnable since we are using AppImage Deployment that only supports on Intel processors while Rasberry Pi uses ARM Processors.

Re: How to deploy qt applications in raspberrypi

Sun Mar 29, 2020 3:33 pm

That appimage file cleary states: "-x86_64-". As in Intel's 64 bit x86 processors. As used in PC's and laptops.

The Pi uses an ARM processor, like mobile phones and tablets.

Programs compiled for x86 do not run on ARM and vice versa.

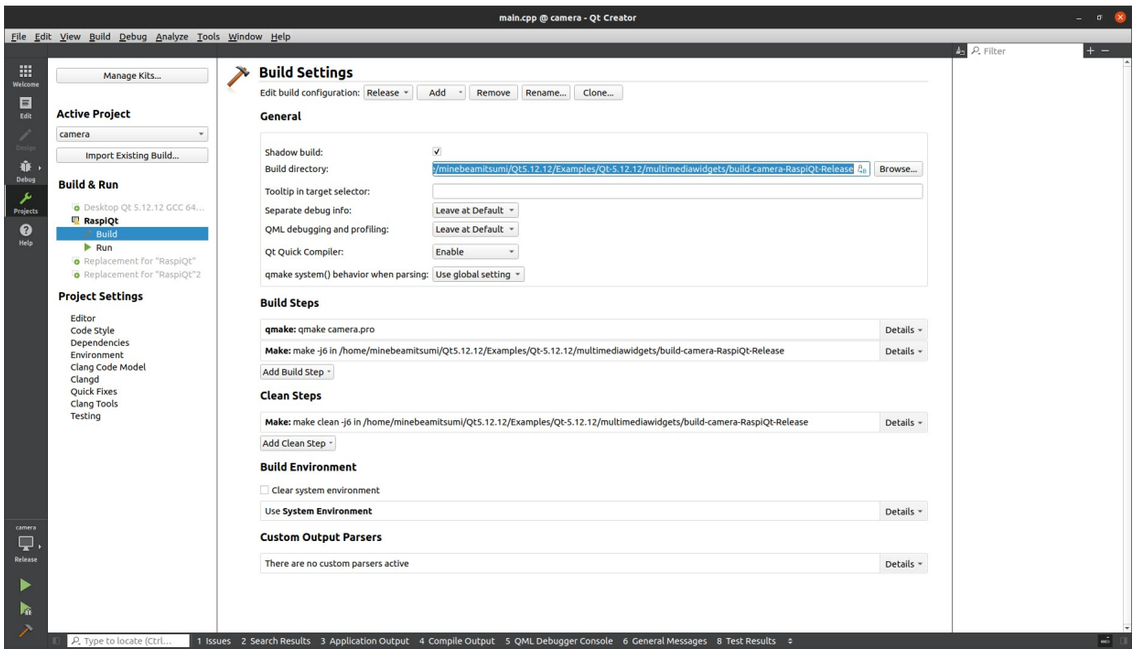
Links for Qt Cross Compilation for Raspberry Pi
https://www.youtube.com/watch?v=TmtN3Rmx9Rk&t=3s&ab_channel=UlasDikme
https://github.com/PhysicsX/QTonRaspberryPi/tree/main/QtRaspberryPi5.14.2

Note: Follow the youtube video on how to setup the Qt Creator for Cross Compilation on Raspberry Pi.

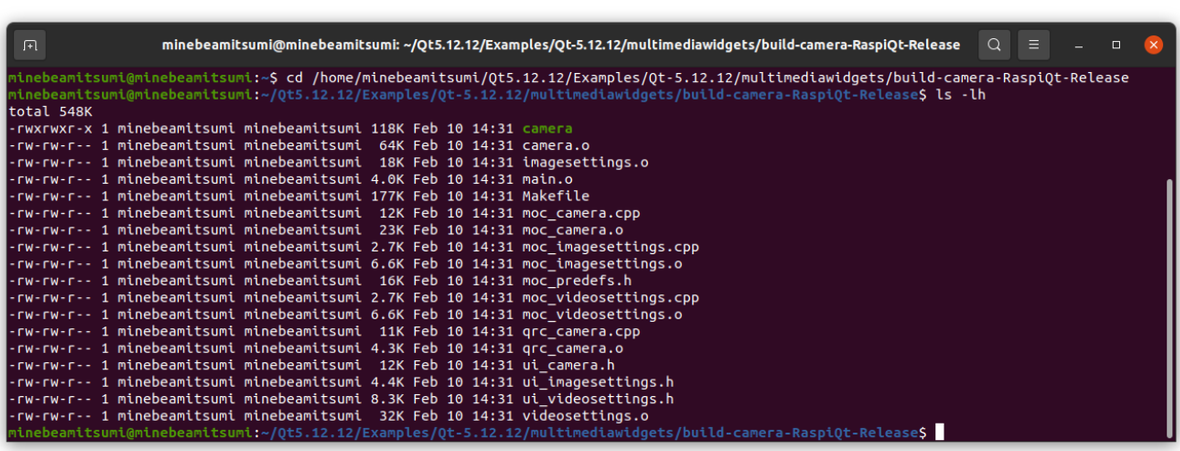
Download Links:
https://releases.linaro.org/components/toolchain/binaries/7.5-2019.12/arm-linux-gnueabihf/
https://download.qt.io/official_releases/qt/5.15/5.15.8/single/

Based on the links above, deployment on raspberry made possible. Using the camera app example from Qt Creator, we made a deployment on raspberry pi device.

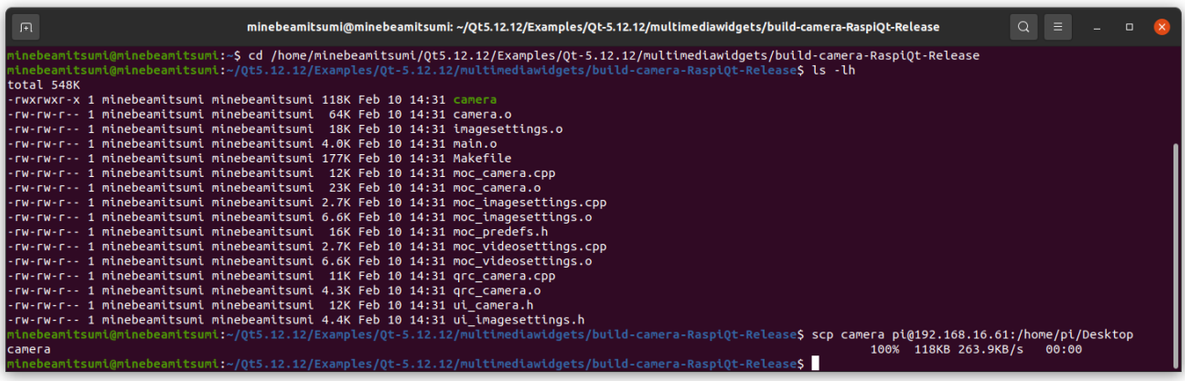
**Goto Projects: Copy build release directory**



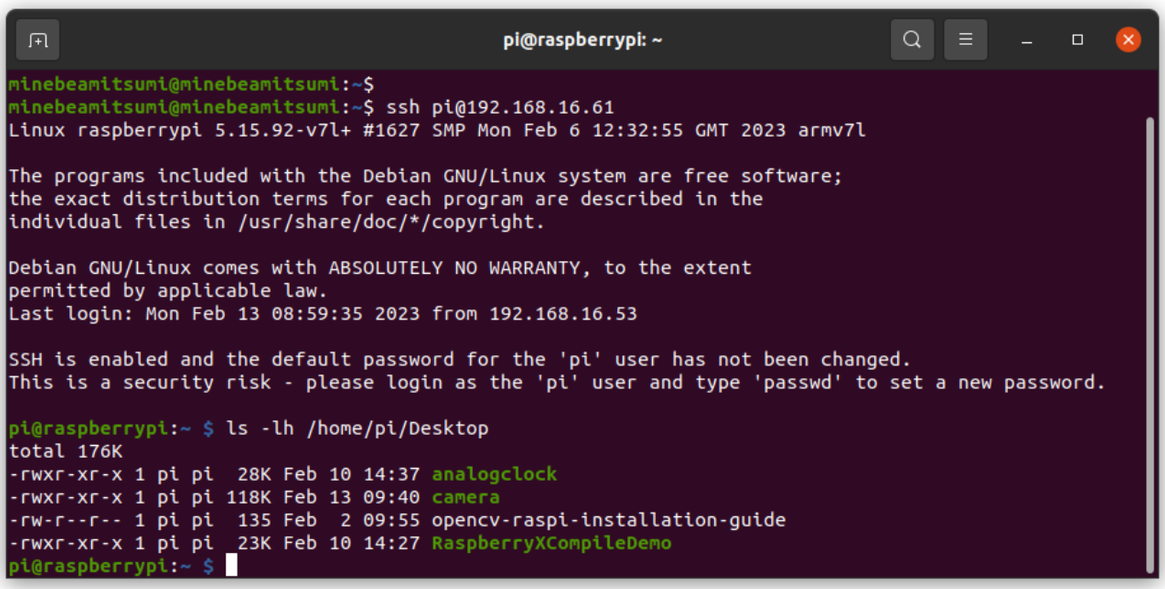

**Open terminal and goto release directory**



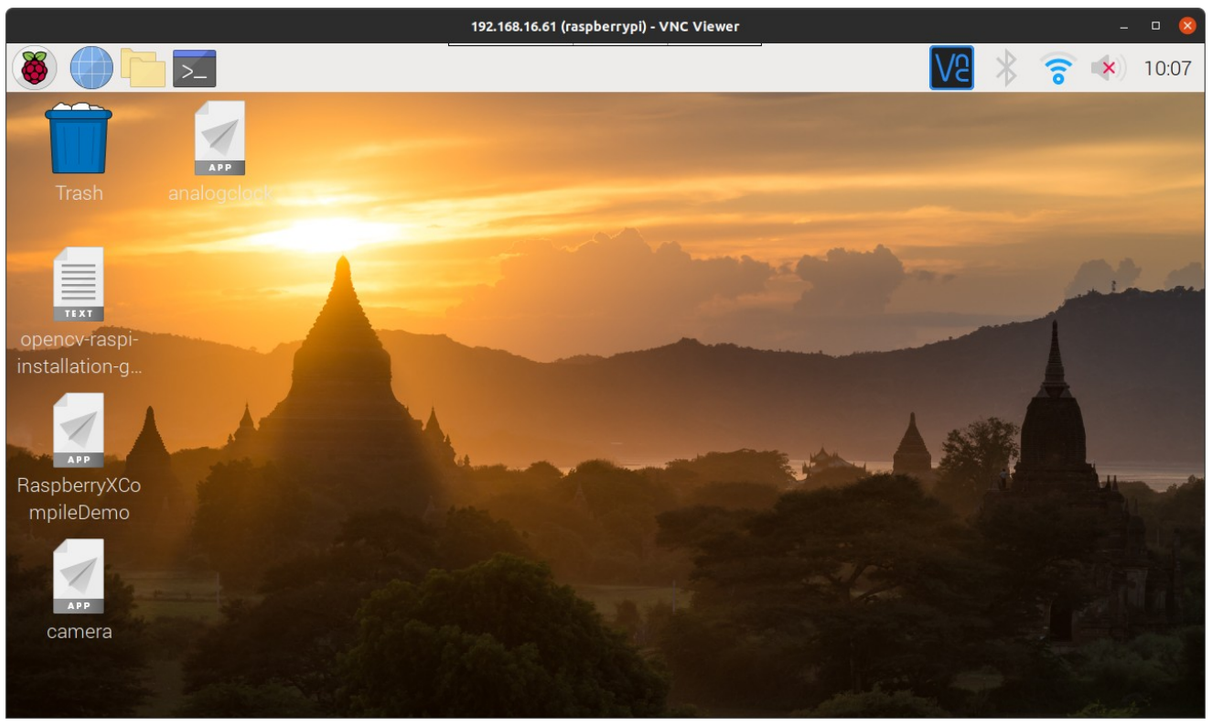

Copy binary file "**camera**" to raspberry pi device

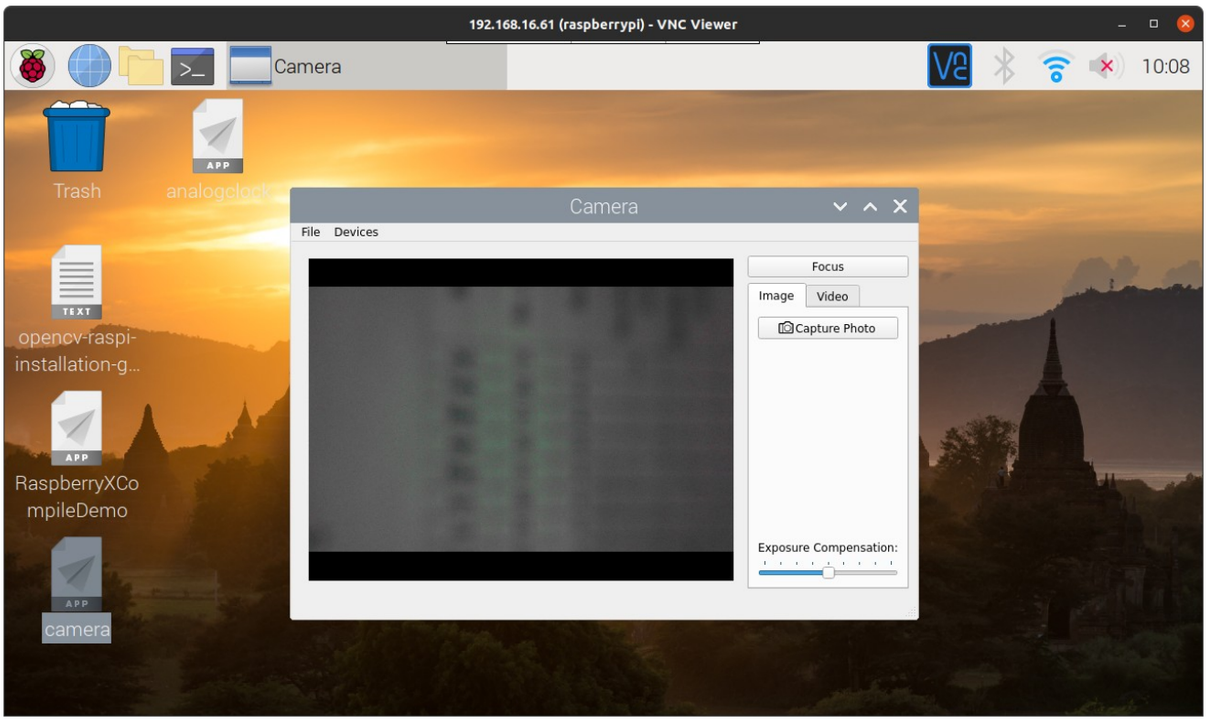



**Check raspberry pi device "ssh pi@192.168.61.16" via host terminal.**




As we can see, the binary file camera copied on raspberry device.
Checking binary file execution. Open Raspberry Pi device via VNC.



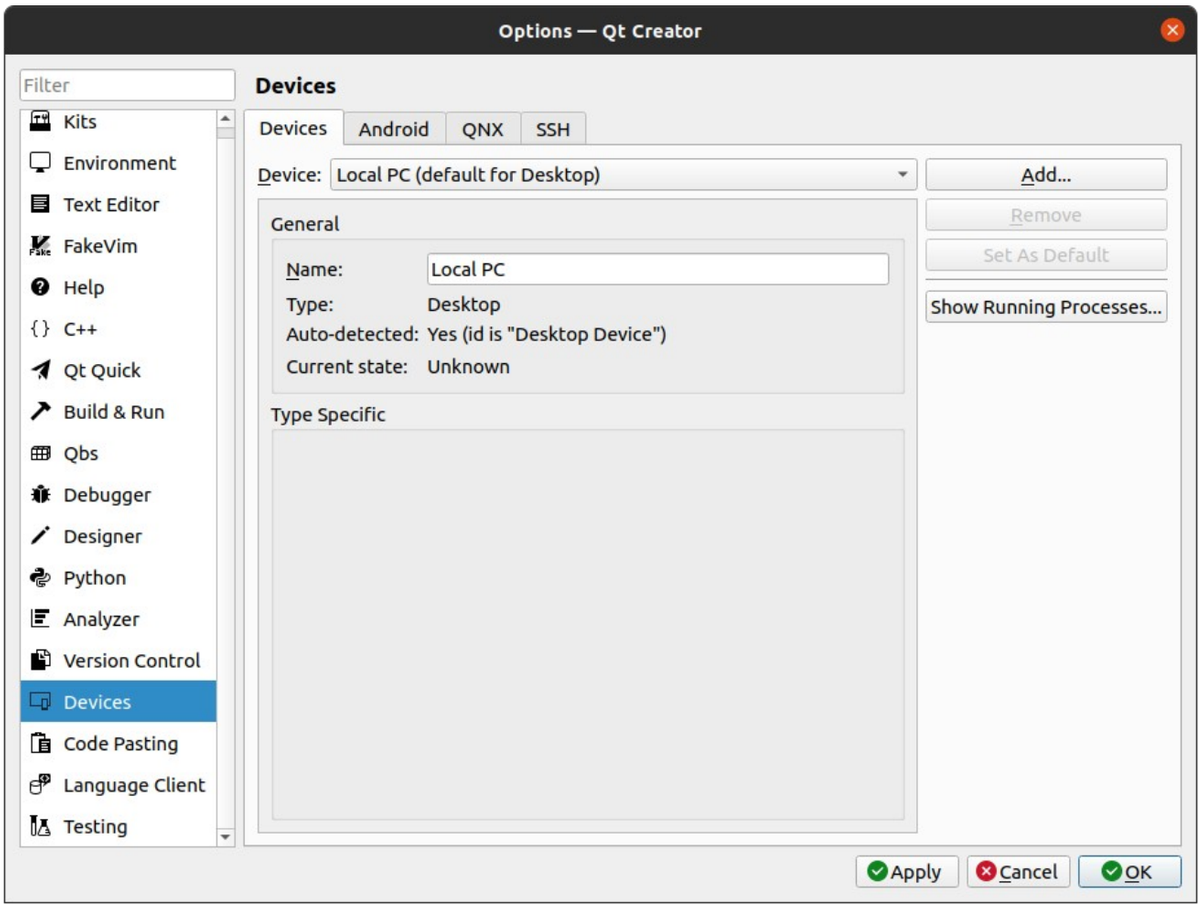



Final result of Cross Compilation on Raspberry Pi is successful.

After running examples from Qt creator, the OpenCVApplication that created must also deploy on Raspberry pi.

**Setting Device for Raspberry Pi**

**Open Qt Creator -> Tools -> Option -> Devices**

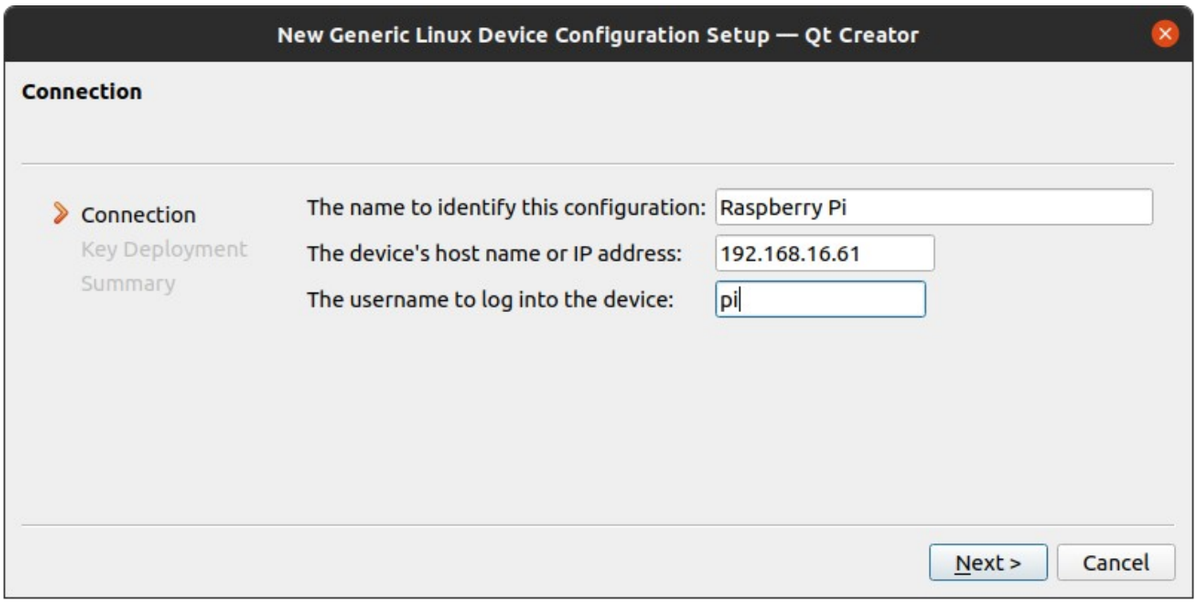


**Click Add -> Select “Generic Linux Device” -> Click “Start Wizard”**

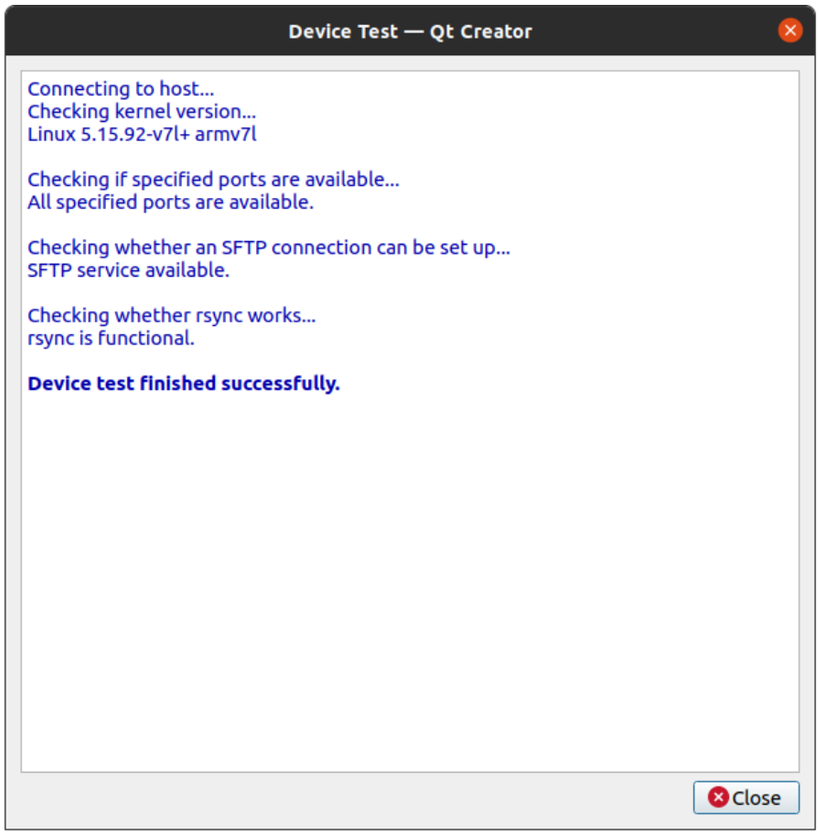

**Connection:**

**Configuration:** Raspberry Pi
**IP Address:** 192.168.16.61
**Username into the device:** pi

**Click Next ->**

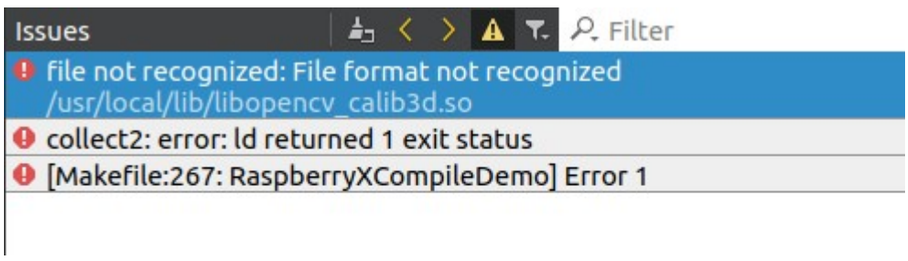


**Establishing Connection Success on Rapsberry Pi device:**

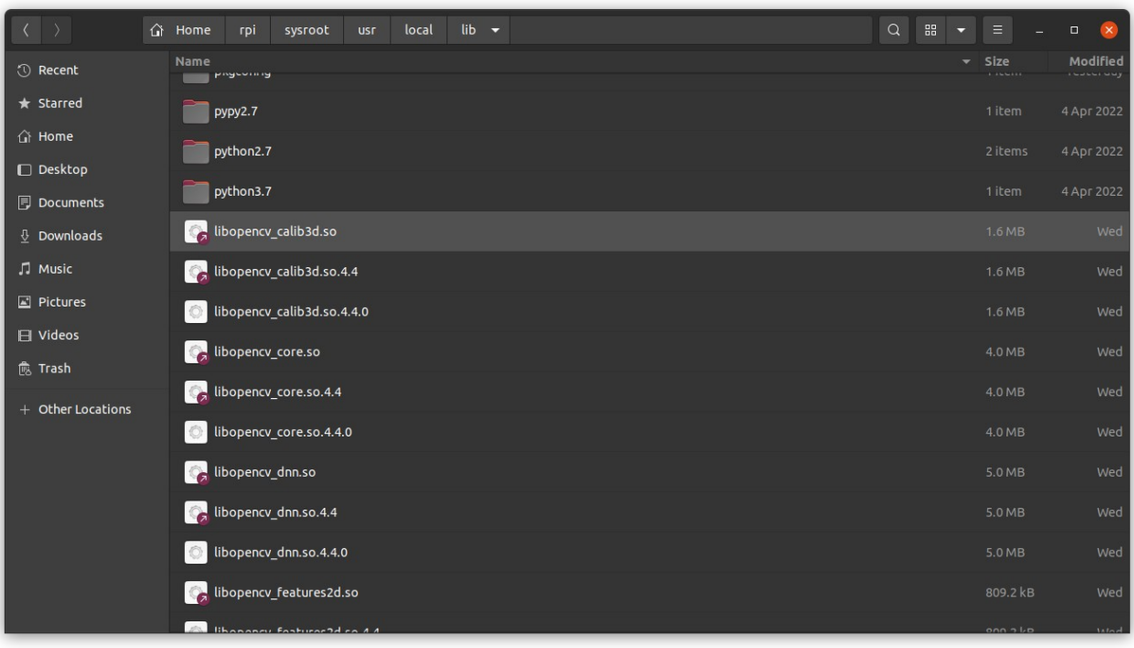



**For OpenCV Development on Raspberry Pi**

Note: After building Opencv ARM compiler for Raspberry Pi device you encounter this kind of error



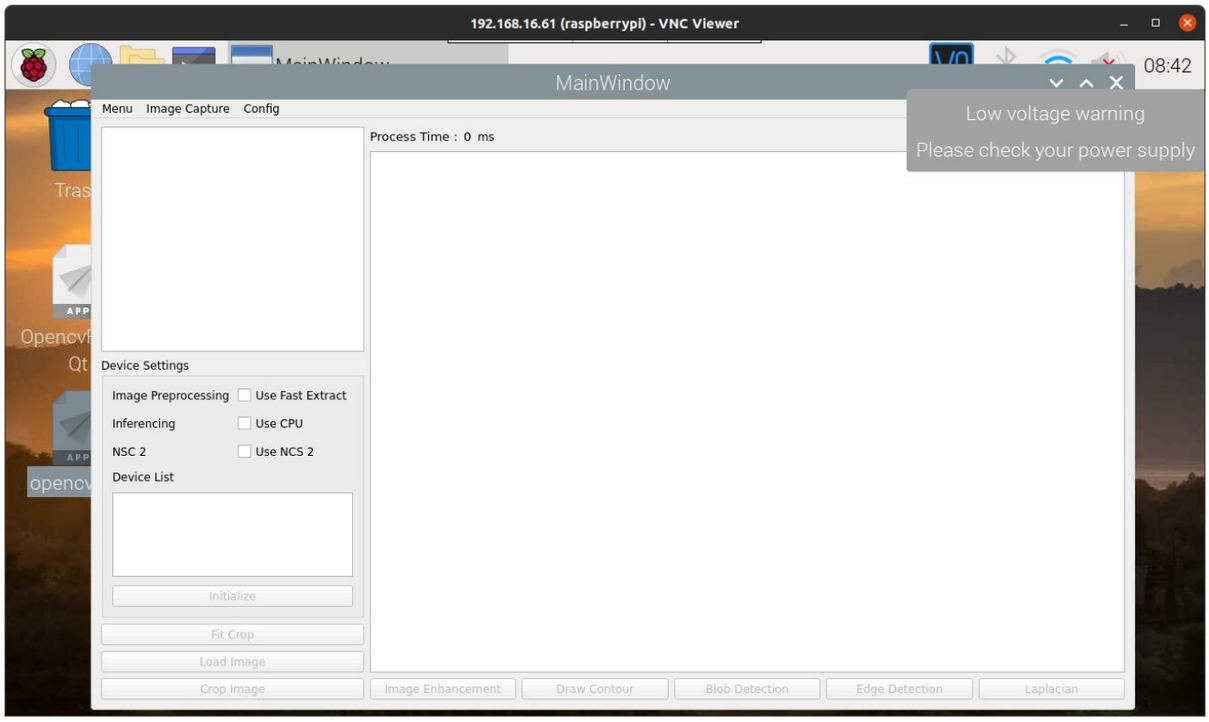

make sure to link properly the .so library folder



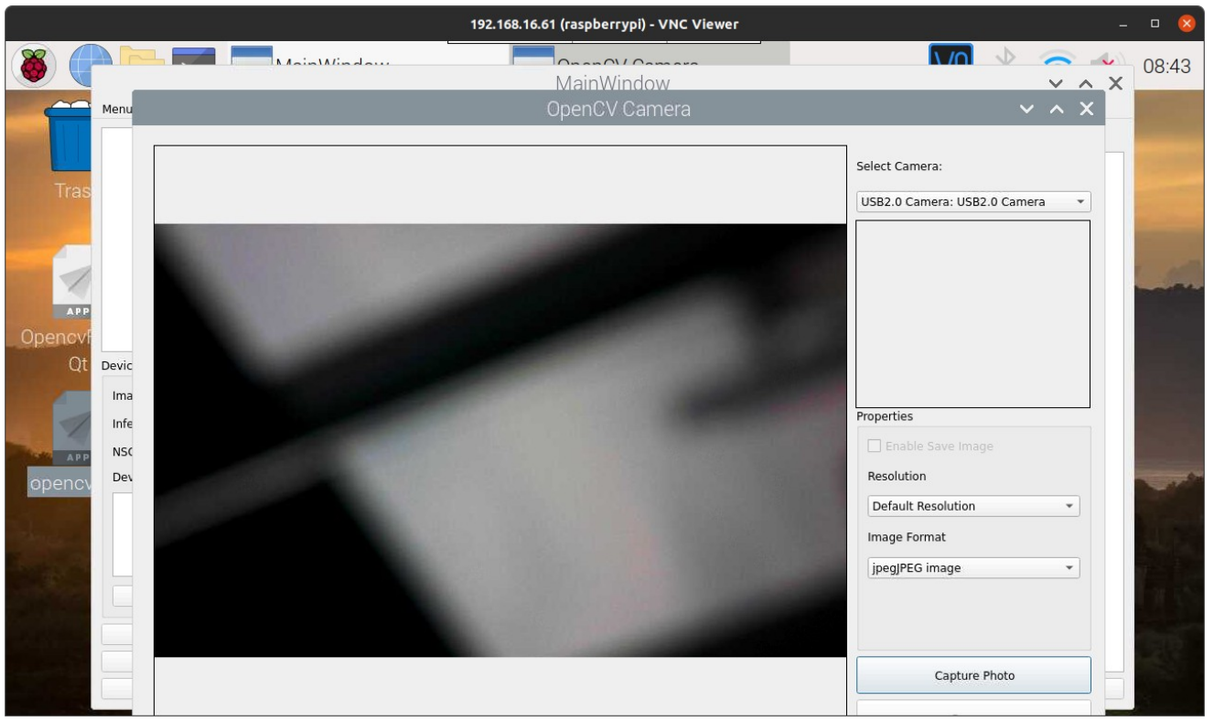
For complete Raspberry Pi Cross Compilation steps. Please refer to this link
https://github.com/manfredipist/RPi3BPlusQtOpenCV
same as my setup.

**Using VNC app**
**Using USB2.0 Micro Camera**

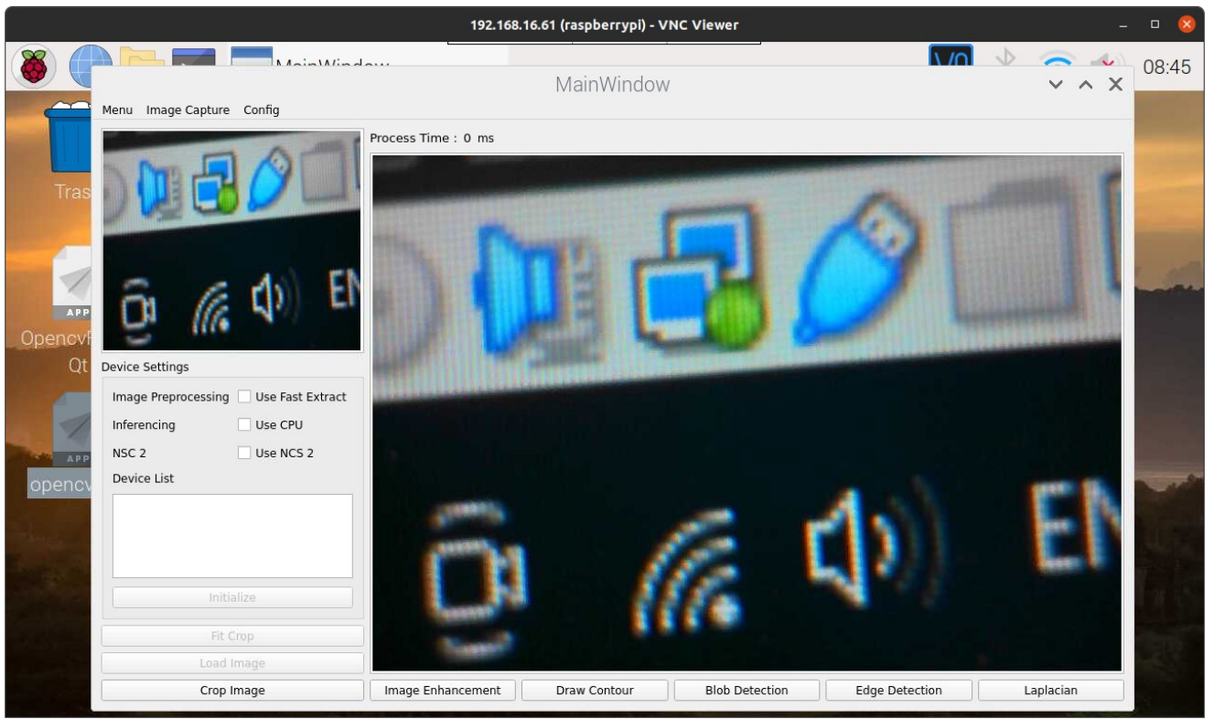
**MainWindow**




**Camera feed**



## Image Capture




## Blob Detection

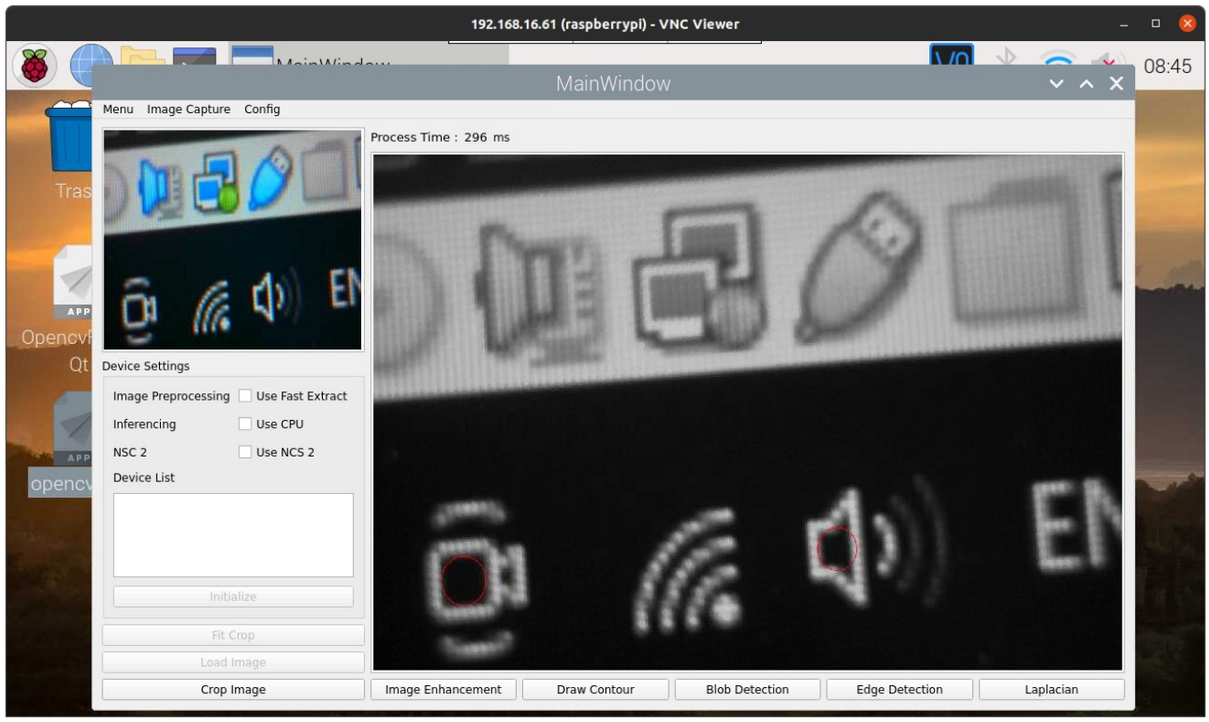


**Image Enhancement (Brightness at 100%)**

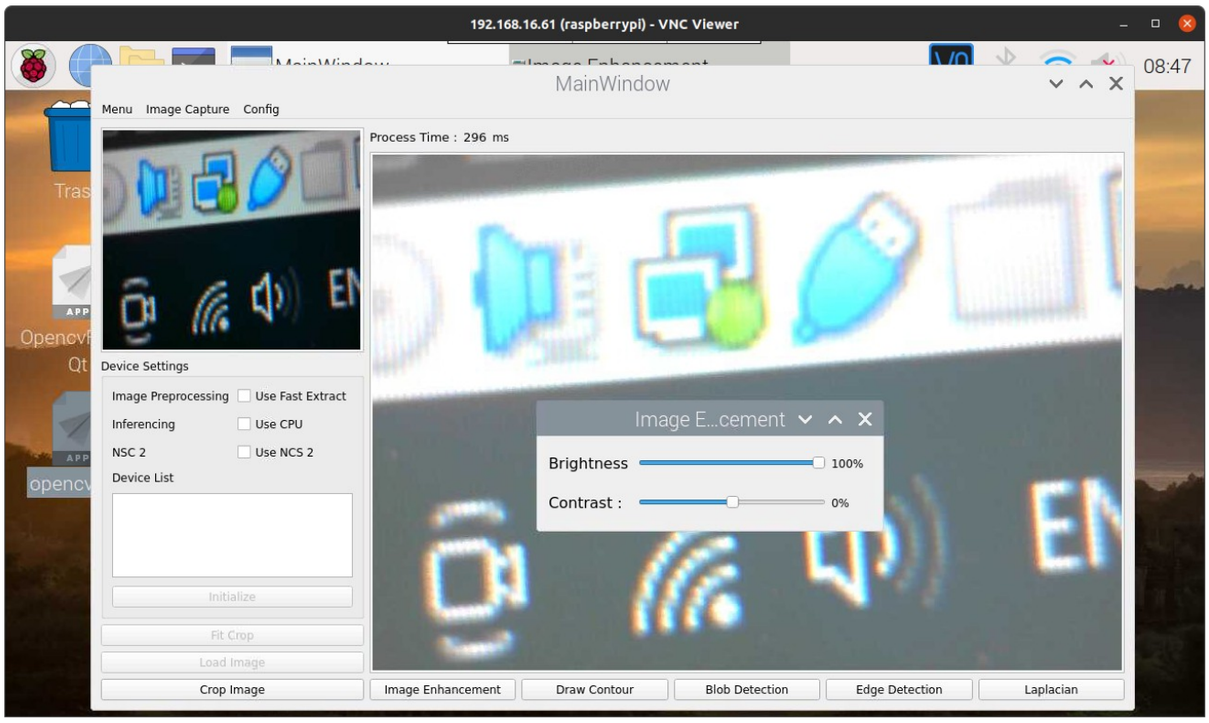



**Image Enhancement (Brightness at -100%)**

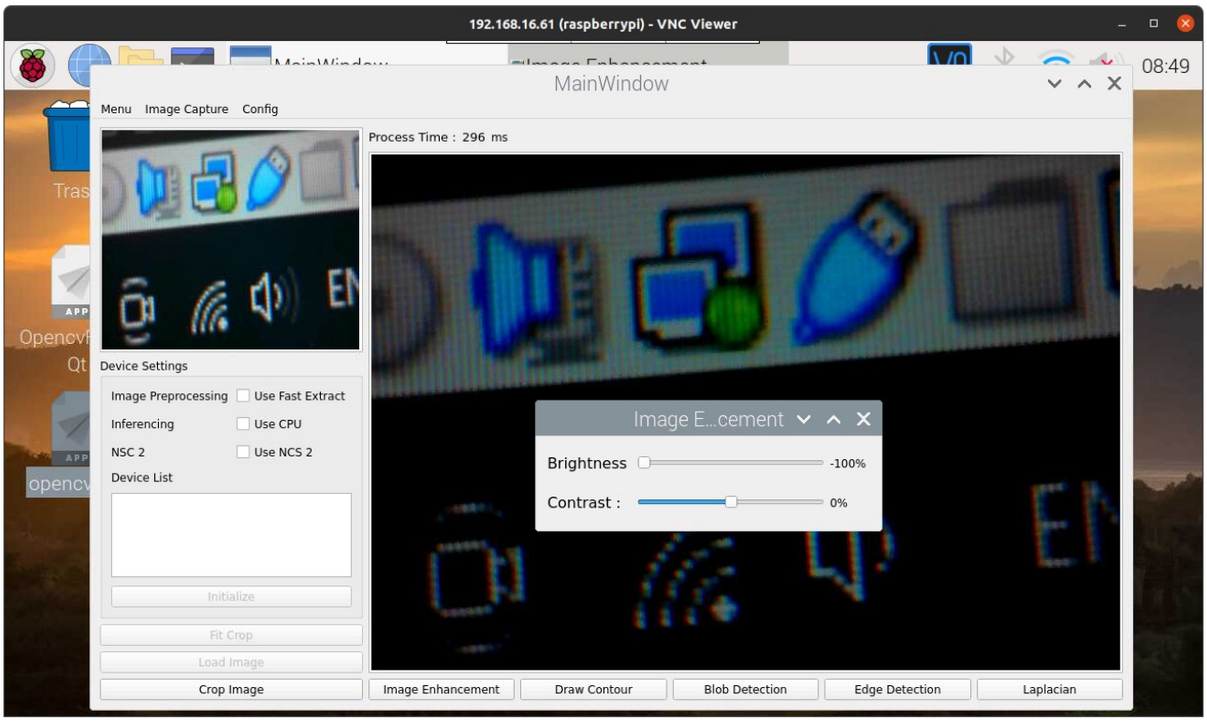
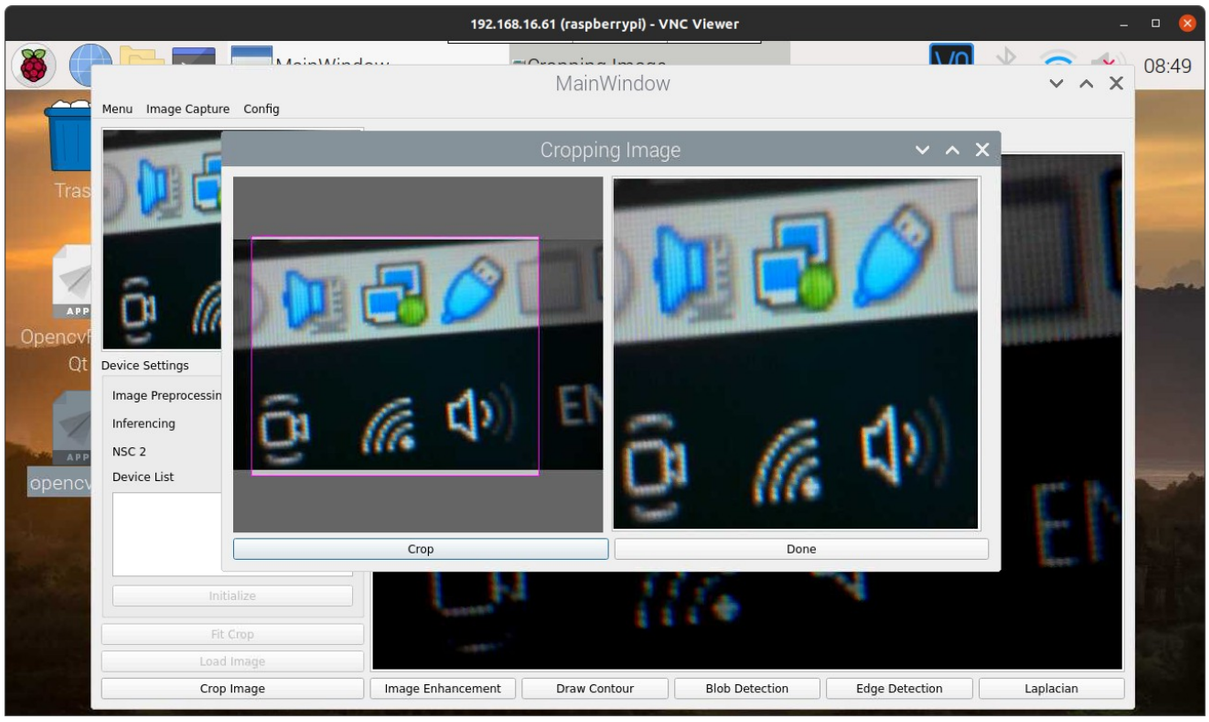


**Image Enhancement (Contrast at 255%)**


**Image Enhancement (Contrast at -255%)**

## Crop Image




## Draw Contour