How to Install OpenCV on Linux

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```
sdr@sdr-Samsung-DeskTop-System:~$ ls
android               ocv
Android               petalinux_zynq
apmplanner2           Pictures
arduino               PlayOnLinux's virtual drives
Arduino               Public
c++                   Qt
clion                 qt_workspace
CLionProjects         self_drive
Desktop               Templates
Documents             test
down_ccs              ti
Downloads             ti-processor-sdk-linux-am57xx-evm-04.03.00.05
down_qt               ti-processor-sdk-linux-am57xx-evm-05.00.00.15
examples.desktop      tmp_boot
fpga                  tmp_fs
i2c_proj              usb
install_vivado        Videos
ip_repo               workspace_v8
lab                   zynq_fpga
lab_fpga              zynq_test
lecture               zynq_workspace
Music                 zynq_zybo
my_proj
sdr@sdr-Samsung-DeskTop-System:~$ mkdir sw
sdr@sdr-Samsung-DeskTop-System:~$ cd sw
sdr@sdr-Samsung-DeskTop-System:~/sw$ █
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw$ pkg-config --modversion opencv
4.0.0
sdr@sdr-Samsung-DeskTop-System:~/sw$ ▯
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw$ pkg-config --modversion opencv
4.0.0
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get purge libopencv* python-opencv
[sudo] password for sdr:
Reading package lists... Done
Building dependency tree
Reading state information... Done
Note, selecting 'libopencv-core-dev' for glob 'libopencv*'
Note, selecting 'libopencv-gpu-dev' for glob 'libopencv*'
Note, selecting 'libopencv-legacy2.4' for glob 'libopencv*'
Note, selecting 'libopencv-apps0d' for glob 'libopencv*'
Note, selecting 'libopencv-video2.4' for glob 'libopencv*'
Note, selecting 'libopencv-calib3d-dev' for glob 'libopencv*'
Note, selecting 'libopencv-ml-dev' for glob 'libopencv*'
Note, selecting 'libopencv-imgproc2.4v5' for glob 'libopencv*'
Note, selecting 'libopencv-objdetect2.4v5' for glob 'libopencv*'
Note, selecting 'libopencv-video2.4v5' for glob 'libopencv*'
Note, selecting 'libopencv-highgui2.4' for glob 'libopencv*'
Note, selecting 'libopencv-apps-dev' for glob 'libopencv*'
Note, selecting 'libopencv-calib3d2.4' for glob 'libopencv*'
Note, selecting 'libopencv-ocl-dev' for glob 'libopencv*'
Note, selecting 'libopencv-ml2.4' for glob 'libopencv*'
Note, selecting 'libopencv-imgproc2.4' for glob 'libopencv*'
Note, selecting 'libopencv-ts2.4v5' for glob 'libopencv*'
Note, selecting 'libopencv-ocl2.4' for glob 'libopencv*'
Note, selecting 'libopencv-objdetect2.4' for glob 'libopencv*'
Note, selecting 'libopencv-flann2.4v5' for glob 'libopencv*'
Note, selecting 'libopencv-contrib2.4v5' for glob 'libopencv*'
Note, selecting 'libopencv-stitching-dev' for glob 'libopencv*'
Note, selecting 'libopencv-highgui2.4v5' for glob 'libopencv*'
Note, selecting 'libopencv2.4-java' for glob 'libopencv*'
Note, selecting 'libopencv-features2d-dev' for glob 'libopencv*'
Note, selecting 'libopencv-superres-dev' for glob 'libopencv*'
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get autoremove
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages will be REMOVED:
  binutils-arm-linux-gnueabi cpp-5-arm-linux-gnueabi cpp-arm-linux-gnueabi freepats
  gcc-5-arm-linux-gnueabi-base gcc-5-cross-base gstreamer1.0-plugins-bad-faad
  gstreamer1.0-plugins-bad-videoparsers libasan2-armel-cross libass5
  libatomic1-armel-cross libbs2b0 libc6-armel-cross libc6-dev-armel-cross
  libchromaprint0 libdca0 libde265-0 libfaad2 libfluidsynth1 libgcc-5-dev-armel-cross
  libgcc1-armel-cross libgomp1-armel-cross libgstreamer-plugins-bad1.0-0 libgtkglext1
  libkate1 libllvm5.0:i386 libmimic0 libmjpegutils-2.1-0 libmms0 libmpeg2encpp-2.1-0
  libmplex2-2.1-0 libofa0 libpostproc-ffmpeg53 libsodium18 libsoundtouch1 libsrtp0
  libstdc++6-armel-cross libubsan0-armel-cross libvo-aacenc0 libvo-amrwbenc0
  libwildmidi-config libwildmidi1 libzbar0 libzmq5 linux-headers-4.10.0-28
  linux-headers-4.10.0-28-generic linux-headers-4.13.0-32
  linux-headers-4.13.0-32-generic linux-headers-4.13.0-36
  linux-headers-4.13.0-36-generic linux-headers-4.13.0-37
  linux-headers-4.13.0-37-generic linux-headers-4.13.0-41
  linux-headers-4.13.0-41-generic linux-headers-4.13.0-43
  linux-headers-4.13.0-43-generic linux-headers-4.15.0-24
  linux-headers-4.15.0-24-generic linux-headers-4.15.0-29
  linux-headers-4.15.0-29-generic linux-headers-4.15.0-32
  linux-headers-4.15.0-32-generic linux-image-4.10.0-28-generic
  linux-image-4.13.0-32-generic linux-image-4.13.0-36-generic
  linux-image-4.13.0-37-generic linux-image-4.13.0-41-generic
  linux-image-4.13.0-43-generic linux-image-4.15.0-24-generic
  linux-image-4.15.0-29-generic linux-image-4.15.0-32-generic
  linux-image-extra-4.10.0-28-generic linux-image-extra-4.13.0-32-generic
  linux-image-extra-4.13.0-36-generic linux-image-extra-4.13.0-37-generic
  linux-image-extra-4.13.0-41-generic linux-image-extra-4.13.0-43-generic
  linux-libc-dev-armel-cross linux-modules-4.15.0-24-generic
  linux-modules-4.15.0-29-generic linux-modules-4.15.0-32-generic
  linux-signed-image-4.13.0-32-generic linux-signed-image-4.13.0-36-generic
  linux-signed-image-4.13.0-37-generic linux-signed-image-4.13.0-41-generic
  linux-signed-image-4.13.0-43-generic linux-signed-image-generic-hwe-16.04
0 upgraded, 0 newly installed, 87 to remove and 243 not upgraded.
After this operation, 2,552 MB disk space will be freed.
Do you want to continue? [Y/n] y
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get update
Hit:1 http://kr.archive.ubuntu.com/ubuntu xenial InRelease
Get:2 http://kr.archive.ubuntu.com/ubuntu xenial-updates InRelease [109 kB]
Get:3 http://kr.archive.ubuntu.com/ubuntu xenial-backports InRelease [107 kB]
Get:4 http://kr.archive.ubuntu.com/ubuntu xenial-updates/main amd64 Packages [868 kB]
Get:5 http://kr.archive.ubuntu.com/ubuntu xenial-updates/main i386 Packages [776 kB]
Get:6 http://kr.archive.ubuntu.com/ubuntu xenial-updates/main amd64 DEP-11 Metadata [320
kB]
Get:7 http://kr.archive.ubuntu.com/ubuntu xenial-updates/main DEP-11 64x64 Icons [235 kB]
Hit:8 http://ppa.launchpad.net/maarten-baert/simplescreenrecorder/ubuntu xenial InRelease
Get:9 http://kr.archive.ubuntu.com/ubuntu xenial-updates/universe amd64 Packages [697 kB]
Get:10 http://kr.archive.ubuntu.com/ubuntu xenial-updates/universe i386 Packages [639 kB]
Get:11 http://kr.archive.ubuntu.com/ubuntu xenial-updates/universe amd64 DEP-11 Metadata
[247 kB]
Get:12 http://kr.archive.ubuntu.com/ubuntu xenial-updates/universe DEP-11 64x64 Icons [33
9 kB]
Get:13 http://kr.archive.ubuntu.com/ubuntu xenial-updates/multiverse amd64 DEP-11 Metadat
a [5,960 B]
Get:14 http://kr.archive.ubuntu.com/ubuntu xenial-backports/main amd64 DEP-11 Metadata [3
,328 B]
Get:15 http://kr.archive.ubuntu.com/ubuntu xenial-backports/universe amd64 DEP-11 Metadat
a [5,104 B]
Hit:16 http://deb.playonlinux.com precise InRelease
Get:17 http://security.ubuntu.com/ubuntu xenial-security InRelease [107 kB]
Hit:18 http://ppa.launchpad.net/soylent-tv/screenstudio/ubuntu xenial InRelease
Get:19 http://security.ubuntu.com/ubuntu xenial-security/main amd64 Packages [573 kB]
Get:20 http://security.ubuntu.com/ubuntu xenial-security/main i386 Packages [493 kB]
Get:21 http://security.ubuntu.com/ubuntu xenial-security/main amd64 DEP-11 Metadata [67.7
 kB]
Get:22 http://security.ubuntu.com/ubuntu xenial-security/main DEP-11 64x64 Icons [68.0 kB
]
Get:23 http://security.ubuntu.com/ubuntu xenial-security/universe amd64 DEP-11 Metadata [
108 kB]
Get:24 http://security.ubuntu.com/ubuntu xenial-security/universe DEP-11 64x64 Icons [150
 kB]
Fetched 5,917 kB in 23s (253 kB/s)
AppStream cache update completed, but some metadata was ignored due to errors.
Reading package lists... Done
sdr@sdr-Samsung-DeskTop-System:~/sw$
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get install build-essential cmake
[sudo] password for sdr:
Reading package lists... Done
Building dependency tree
Reading state information... Done
build-essential is already the newest version (12.1ubuntu2).
cmake is already the newest version (3.5.1-1ubuntu3).
0 upgraded, 0 newly installed, 0 to remove and 244 not upgraded.
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get install pkg-config
Reading package lists... Done
Building dependency tree
Reading state information... Done
pkg-config is already the newest version (0.29.1-0ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 244 not upgraded.
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get install libjpeg-dev libtiff5-dev libjas
per-dev libpng12-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
libjpeg-dev is already the newest version (8c-2ubuntu8).
libjasper-dev is already the newest version (1.900.1-debian1-2.4ubuntu1.2).
libpng12-dev is already the newest version (1.2.54-1ubuntu1.1).
libtiff5-dev is already the newest version (4.0.6-1ubuntu0.4).
0 upgraded, 0 newly installed, 0 to remove and 244 not upgraded.
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get install libavcodec-dev libavformat-dev
libswscale-dev libxvidcore-dev libx264-dev libxine2-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
libx264-dev is already the newest version (2:0.148.2643+git5c65704-1).
libxine2-dev is already the newest version (1.2.6-1build5).
libxvidcore-dev is already the newest version (2:1.3.4-1).
libavcodec-dev is already the newest version (7:2.8.15-0ubuntu0.16.04.1).
libavformat-dev is already the newest version (7:2.8.15-0ubuntu0.16.04.1).
libswscale-dev is already the newest version (7:2.8.15-0ubuntu0.16.04.1).
0 upgraded, 0 newly installed, 0 to remove and 244 not upgraded.
sdr@sdr-Samsung-DeskTop-System:~/sw$
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```
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get install libv4l-dev v4l-utils
Reading package lists... Done
Building dependency tree
Reading state information... Done
libv4l-dev is already the newest version (1.10.0-1).
v4l-utils is already the newest version (1.10.0-1).
0 upgraded, 0 newly installed, 0 to remove and 244 not upgraded.
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get install libgstreamer1.0-dev libgstreame
r-plugins-base1.0-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  gstreamer1.0-doc
The following NEW packages will be installed:
  libgstreamer-plugins-base1.0-dev libgstreamer1.0-dev
0 upgraded, 2 newly installed, 0 to remove and 244 not upgraded.
Need to get 608 kB of archives.
After this operation, 7,745 kB of additional disk space will be used.
Get:1 http://kr.archive.ubuntu.com/ubuntu xenial-updates/main amd64 libgstreamer1.0-dev a
md64 1.8.3-1~ubuntu0.1 [373 kB]
Get:2 http://kr.archive.ubuntu.com/ubuntu xenial-updates/main amd64 libgstreamer-plugins-
base1.0-dev amd64 1.8.3-1ubuntu0.2 [236 kB]
Fetched 608 kB in 0s (1,990 kB/s)
Selecting previously unselected package libgstreamer1.0-dev.
(Reading database ... 247383 files and directories currently installed.)
Preparing to unpack .../libgstreamer1.0-dev_1.8.3-1~ubuntu0.1_amd64.deb ...
Adding 'diversion of /usr/bin/dh_gstscancodecs to /usr/bin/dh_gstscancodecs-gst0.10 by li
bgstreamer1.0-dev'
Adding 'diversion of /usr/share/man/man1/dh_gstscancodecs.1.gz to /usr/share/man/man1/dh_
gstscancodecs.1.gz-gst0.10 by libgstreamer1.0-dev'
Unpacking libgstreamer1.0-dev (1.8.3-1~ubuntu0.1) ...
Selecting previously unselected package libgstreamer-plugins-base1.0-dev.
Preparing to unpack .../libgstreamer-plugins-base1.0-dev_1.8.3-1ubuntu0.2_amd64.deb ...
Unpacking libgstreamer-plugins-base1.0-dev (1.8.3-1ubuntu0.2) ...
Processing triggers for man-db (2.7.5-1) ...
Setting up libgstreamer1.0-dev (1.8.3-1~ubuntu0.1) ...
Setting up libgstreamer-plugins-base1.0-dev (1.8.3-1ubuntu0.2) ...
sdr@sdr-Samsung-DeskTop-System:~/sw$
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get install libqt4-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libqt4-designer libqt4-dev-bin libqt4-help libqt4-opengl libqt4-opengl-dev
  libqt4-qt3support libqt4-scripttools libqt4-svg libqt4-test qt4-linguist-tools
  qt4-qmake
Suggested packages:
  firebird-dev libmysqlclient-dev libpq-dev libsqlite0-dev libsqlite3-dev qt4-dev-tools
  qt4-doc unixodbc-dev
The following NEW packages will be installed:
  libqt4-designer libqt4-dev libqt4-dev-bin libqt4-help libqt4-opengl libqt4-opengl-dev
  libqt4-qt3support libqt4-scripttools libqt4-svg libqt4-test qt4-linguist-tools
  qt4-qmake
0 upgraded, 12 newly installed, 0 to remove and 244 not upgraded.
Need to get 10.3 MB of archives.
After this operation, 46.3 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 libqt4-designer amd64 4:4.8.7
+dfsg-5ubuntu2 [3,631 kB]
Get:2 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 libqt4-qt3support amd64 4:4.8
.7+dfsg-5ubuntu2 [1,051 kB]
Get:3 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 libqt4-dev-bin amd64 4:4.8.7+
dfsg-5ubuntu2 [1,635 kB]
Get:4 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 libqt4-help amd64 4:4.8.7+dfs
g-5ubuntu2 [207 kB]
Get:5 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 libqt4-scripttools amd64 4:4.
8.7+dfsg-5ubuntu2 [224 kB]
Get:6 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 libqt4-svg amd64 4:4.8.7+dfsg
-5ubuntu2 [138 kB]
Get:7 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 libqt4-test amd64 4:4.8.7+dfs
g-5ubuntu2 [61.1 kB]
Get:8 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 qt4-linguist-tools amd64 4:4.
8.7+dfsg-5ubuntu2 [848 kB]
Get:9 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 qt4-qmake amd64 4:4.8.7+dfsg-
5ubuntu2 [1,293 kB]
74% [9 qt4-qmake 1,201 B/1,293 kB 0%]
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get install libatlas-base-dev gfortran libe
igen3-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
gfortran is already the newest version (4:5.3.1-1ubuntu1).
libeigen3-dev is already the newest version (3.3~beta1-2).
The following additional packages will be installed:
  libatlas-dev libatlas3-base libblas-dev
Suggested packages:
  libblas-doc liblapack-doc liblapack-dev liblapack-doc-man
The following NEW packages will be installed:
  libatlas-base-dev libatlas-dev libatlas3-base libblas-dev
0 upgraded, 4 newly installed, 0 to remove and 244 not upgraded.
Need to get 6,468 kB of archives.
After this operation, 43.2 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://kr.archive.ubuntu.com/ubuntu xenial/universe amd64 libatlas3-base amd64 3.10
.2-9 [2,697 kB]
0% [1 libatlas3-base 1,201 B/2,697 kB 0%]
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw$ sudo apt-get install python3-dev python-numpy python
3-numpy
Reading package lists... Done
Building dependency tree
Reading state information... Done
python-numpy is already the newest version (1:1.11.0-1ubuntu1).
The following additional packages will be installed:
  libpython3-dev libpython3.5-dev python3.5-dev
Suggested packages:
  python-numpy-doc python3-nose python3-numpy-dbg
The following NEW packages will be installed:
  libpython3-dev libpython3.5-dev python3-dev python3-numpy python3.5-dev
0 upgraded, 5 newly installed, 0 to remove and 244 not upgraded.
Need to get 39.5 MB of archives.
After this operation, 63.6 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://kr.archive.ubuntu.com/ubuntu xenial-updates/main amd64 libpython3.5-dev amd6
4 3.5.2-2ubuntu0~16.04.4 [37.3 MB]
Get:2 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 libpython3-dev amd64 3.5.1-3
[6,926 B]
Get:3 http://kr.archive.ubuntu.com/ubuntu xenial-updates/main amd64 python3.5-dev amd64 3
.5.2-2ubuntu0~16.04.4 [413 kB]
Get:4 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 python3-dev amd64 3.5.1-3 [1,
186 B]
Get:5 http://kr.archive.ubuntu.com/ubuntu xenial/main amd64 python3-numpy amd64 1:1.11.0-
1ubuntu1 [1,762 kB]
Fetched 39.5 MB in 7s (5,412 kB/s)
Selecting previously unselected package libpython3.5-dev:amd64.
(Reading database ... 251758 files and directories currently installed.)
Preparing to unpack .../libpython3.5-dev_3.5.2-2ubuntu0~16.04.4_amd64.deb ...
Unpacking libpython3.5-dev:amd64 (3.5.2-2ubuntu0~16.04.4) ...
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw$ mkdir opencv
sdr@sdr-Samsung-DeskTop-System:~/sw$ cd opencv
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv$ wget -O opencv.zip https://github.com/opencv/
opencv/archive/3.4.0.zip
--2018-10-26 00:40:50--  https://github.com/opencv/opencv/archive/3.4.0.zip
Resolving github.com (github.com)... 192.30.255.113, 192.30.255.112
Connecting to github.com (github.com)|192.30.255.113|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://codeload.github.com/opencv/opencv/zip/3.4.0 [following]
--2018-10-26 00:40:51--  https://codeload.github.com/opencv/opencv/zip/3.4.0
Resolving codeload.github.com (codeload.github.com)... 192.30.255.121, 192.30.255.120
Connecting to codeload.github.com (codeload.github.com)|192.30.255.121|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [application/zip]
Saving to: 'opencv.zip'

opencv.zip                [        <=>              ]  86.82M   785KB/s    in 2m 29s

2018-10-26 00:43:21 (596 KB/s) - 'opencv.zip' saved [91041793]

sdr@sdr-Samsung-DeskTop-System:~/sw/opencv$ unzip opencv.zip █
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv$ wget -O opencv_contrib.zip https://github.com
/opencv/opencv_contrib/archive/3.4.0.zip
--2018-10-26 00:44:56--  https://github.com/opencv/opencv_contrib/archive/3.4.0.zip
Resolving github.com (github.com)... 192.30.255.112, 192.30.255.113
Connecting to github.com (github.com)|192.30.255.112|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://codeload.github.com/opencv/opencv_contrib/zip/3.4.0 [following]
--2018-10-26 00:44:57--  https://codeload.github.com/opencv/opencv_contrib/zip/3.4.0
Resolving codeload.github.com (codeload.github.com)... 192.30.255.121, 192.30.255.120
Connecting to codeload.github.com (codeload.github.com)|192.30.255.121|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [application/zip]
Saving to: 'opencv_contrib.zip'

opencv_contrib.zip          [ <=>                    ] 54.50M   200KB/s    in 5m 46s

2018-10-26 00:50:44 (161 KB/s) - 'opencv_contrib.zip' saved [57147512]

sdr@sdr-Samsung-DeskTop-System:~/sw/opencv$ unzip opencv_contrib.zip █
```

```
  inflating: opencv_contrib-3.4.0/modules/xphoto/src/learning_based_co
pp
  inflating: opencv_contrib-3.4.0/modules/xphoto/src/norm2.hpp
  inflating: opencv_contrib-3.4.0/modules/xphoto/src/photomontage.hpp
  inflating: opencv_contrib-3.4.0/modules/xphoto/src/simple_color_bala
  inflating: opencv_contrib-3.4.0/modules/xphoto/src/whs.hpp
   creating: opencv_contrib-3.4.0/modules/xphoto/test/
  inflating: opencv_contrib-3.4.0/modules/xphoto/test/dct_image_denois
  inflating: opencv_contrib-3.4.0/modules/xphoto/test/simple_color_bal
  inflating: opencv_contrib-3.4.0/modules/xphoto/test/test_denoise_bm3
  inflating: opencv_contrib-3.4.0/modules/xphoto/test/test_grayworld.c
  inflating: opencv_contrib-3.4.0/modules/xphoto/test/test_learning_ba
pp
 extracting: opencv_contrib-3.4.0/modules/xphoto/test/test_main.cpp
  inflating: opencv_contrib-3.4.0/modules/xphoto/test/test_precomp.hpp
   creating: opencv_contrib-3.4.0/modules/xphoto/tutorials/
  inflating: opencv_contrib-3.4.0/modules/xphoto/tutorials/training_wh
n
   creating: opencv_contrib-3.4.0/samples/
   creating: opencv_contrib-3.4.0/samples/data/
  inflating: opencv_contrib-3.4.0/samples/data/corridor.jpg
   creating: opencv_contrib-3.4.0/samples/python2/
  inflating: opencv_contrib-3.4.0/samples/python2/common.py
  inflating: opencv_contrib-3.4.0/samples/python2/dis_opt_flow.py
  inflating: opencv_contrib-3.4.0/samples/python2/seeds.py
  inflating: opencv_contrib-3.4.0/samples/python2/video.py
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv$ ls -d */
opencv-3.4.0/  opencv_contrib-3.4.0/
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv$ ▮
```

```
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv$ cd opencv-3.4.0/
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0$ mkdir build
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0$ cd build
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ cmake -D CMAKE_BUILD_TYPE=
RELEASE -D CMAKE_INSTALL_PREFIX=/usr/local -D WITH_TBB=OFF -D WITH_IPP=OFF -D WITH_1394=O
FF -D BUILD_WITH_DEBUG_INFO=OFF -D BUILD_DOCS=OFF -D INSTALL_C_EXAMPLES=ON -D INSTALL_PYT
HON_EXAMPLES=ON -D BUILD_EXAMPLES=OFF -D BUILD_TESTS=OFF -D BUILD_PERF_TESTS=OFF -D WITH_
QT=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 ../
-- The CXX compiler identification is GNU 5.4.0
-- The C compiler identification is GNU 5.4.0
-- Check for working CXX compiler: /usr/bin/c++
-- Check for working CXX compiler: /usr/bin/c++ -- works
-- Detecting CXX compiler ABI info
-- Detecting CXX compiler ABI info - done
-- Detecting CXX compile features
-- Detecting CXX compile features - done
-- Check for working C compiler: /usr/bin/cc
-- Check for working C compiler: /usr/bin/cc -- works
-- Detecting C compiler ABI info
-- Detecting C compiler ABI info - done
-- Detecting C compile features
-- Detecting C compile features - done
-- Performing Test HAVE_CXX11 (check file: cmake/checks/cxx11.cpp)
-- Performing Test HAVE_CXX11 - Failed
```

```
--       numpy:                          /usr/lib/python2.7/dist-packages/numpy/c
ver 1.11.0)
--       packages path:                  lib/python2.7/dist-packages
--
--    Python 3:
--       Interpreter:                     /usr/bin/python3 (ver 3.5.2)
--       Libraries:                       /usr/lib/x86_64-linux-gnu/libpython3.5m.
)
--       numpy:                          /usr/lib/python3/dist-packages/numpy/cor
r 1.11.0)
--       packages path:                  lib/python3.5/dist-packages
--
--    Python (for build):                 /usr/bin/python2.7
--
--    Java:
--       ant:                             NO
--       JNI:                             NO
--       Java wrappers:                   NO
--       Java tests:                      NO
--
--    Matlab:                             NO
--
--    Install to:                         /usr/local
--  -----------------------------------------------------------
--
-- Configuring done
-- Generating done
-- Build files have been written to: /home/sdr/sw/opencv/opencv-3.4.0/build
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$
```

python 연동이 되지 않을 경우 직접 입력
-D PYTHON2_INCLUDE_DIR=/usr/include/python2.7 ₩
-D PYTHON2_NUMPY_INCLUDE_DIRS=/usr/lib/python2.7/dist-packages/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/python3.5m ₩
-D PYTHON3_NUMPY_INCLUDE_DIRS=/usr/lib/python3/dist-packages/numpy/core/include/ ₩
-D PYTHON3_PACKAGES_PATH=/usr/lib/python3.5/dist-packages ₩
-D PYTHON3_LIBRARY=/usr/lib/x86_64-linux-gnu/libpython3.5m.so ₩

```
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ cmake ..
-- Looking for ccache - not found
-- Found ZLIB: /usr/lib/x86_64-linux-gnu/libz.so (found suitable version
 required is "1.2.3")
-- Found ZLIB: /usr/lib/x86_64-linux-gnu/libz.so (found version "1.2.8")
-- Found OpenEXR: /usr/lib/x86_64-linux-gnu/libIlmImf.so
-- Looking for linux/videodev.h
-- Looking for linux/videodev.h - not found
-- Looking for linux/videodev2.h
-- Looking for linux/videodev2.h - found
-- Looking for sys/videoio.h
-- Looking for sys/videoio.h - not found
-- checking for module 'libavresample'
--   package 'libavresample' not found
-- checking for module 'libgphoto2'
--   package 'libgphoto2' not found
-- Could not find OpenBLAS lib. Turning OpenBLAS_FOUND off
-- Could NOT find Atlas (missing:  Atlas_CLAPACK_INCLUDE_DIR)
-- A library with BLAS API found.
-- A library with LAPACK API found.
-- Could NOT find JNI (missing:  JAVA_AWT_LIBRARY JAVA_JVM_LIBRARY JAVA_
_INCLUDE_PATH2 JAVA_AWT_INCLUDE_PATH)
-- Could NOT find Matlab (missing:  MATLAB_MEX_SCRIPT MATLAB_INCLUDE_DIR
 MATLAB_LIBRARIES MATLAB_LIBRARY_DIRS MATLAB_MEXEXT MATLAB_ARCH MATLAB_B
-- VTK is not found. Please set -DVTK_DIR in CMake to VTK build director
all subdirectory with VTKConfig.cmake file
-- Caffe:   NO
-- Protobuf:   NO
-- Glog:   NO
-- Looking for tiny_dnn.h
-- Looking for tiny_dnn.h - found
-- Found tiny-dnn in: /home/sdr/sw/opencv/opencv-3.4.0/build/3rdparty/ti
0.0a3
-- The protocol buffer compiler is not found (PROTOBUF_PROTOC_EXECUTABLE
-- freetype2:   YES
```

```
--    Matlab:                        NO
--
--    Install to:                    /usr/local
-- -----------------------------------------------------------
--
-- Configuring done
-- Generating done
-- Build files have been written to: /home/sdr/sw/opencv/opencv-3.4.0/build
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ cat /proc/cpuinfo | grep p
rocessor | wc -l
8
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ make -j 4
Scanning dependencies of target gen-pkgconfig
Scanning dependencies of target ittnotify
[  0%] Generate opencv.pc
Scanning dependencies of target libprotobuf
Scanning dependencies of target libwebp
[  0%] Building C object 3rdparty/ittnotify/CMakeFiles/ittnotify.dir/src/ittnotify/ittnot
ify_static.c.o
[  0%] Built target gen-pkgconfig
[  0%] Building C object 3rdparty/ittnotify/CMakeFiles/ittnotify.dir/src/ittnotify/jitpro
filing.c.o
[  0%] Building C object 3rdparty/libwebp/CMakeFiles/libwebp.dir/src/dec/vp8l_dec.c.o
[  0%] Building CXX object 3rdparty/protobuf/CMakeFiles/libprotobuf.dir/src/google/protob
uf/arena.cc.o
[  0%] Building CXX object 3rdparty/protobuf/CMakeFiles/libprotobuf.dir/src/google/protob
uf/arenastring.cc.o
[  0%] Building C object 3rdparty/libwebp/CMakeFiles/libwebp.dir/src/dec/buffer_dec.c.o
[  0%] Building CXX object 3rdparty/protobuf/CMakeFiles/libprotobuf.dir/src/google/protob
uf/extension_set.cc.o
Scanning dependencies of target opencv_core_pch_dephelp
[  1%] Building CXX object modules/core/CMakeFiles/opencv_core_pch_dephelp.dir/opencv_cor
e_pch_dephelp.cxx.o
[  1%] Linking C static library ../lib/libittnotify.a
[  1%] Built target ittnotify
[  1%] Building CXX object 3rdparty/protobuf/CMakeFiles/libprotobuf.dir/src/google/protob
uf/generated_message_util.cc.o
[  2%] Building C object 3rdparty/libwebp/CMakeFiles/libwebp.dir/src/dec/io_dec.c.o
[  2%] Building CXX object 3rdparty/protobuf/CMakeFiles/libprotobuf.dir/src/google/protob
uf/io/coded_stream.cc.o
[  2%] Building C object 3rdparty/libwebp/CMakeFiles/libwebp.dir/src/dec/quant_dec.c.o
[  2%] Building C object 3rdparty/libwebp/CMakeFiles/libwebp.dir/src/dec/vp8_dec.c.o
```

```
[ 98%] Processing OpenCL kernels (optflow)
Scanning dependencies of target opencv_optflow
[ 98%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/src/interfaces.c
pp.o
[ 98%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/src/variational_
refinement.cpp.o
[ 98%] Building CXX object apps/traincascade/CMakeFiles/opencv_traincascade.dir/features.
cpp.o
[ 98%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/src/dis_flow.cpp
.o
[ 98%] Linking CXX executable ../../bin/opencv_traincascade
[ 98%] Built target opencv_traincascade
[ 98%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/src/pcaflow.cpp.
o
[ 98%] Linking CXX shared library ../../lib/libopencv_cvv.so
[ 98%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/src/motempl.cpp.
o
[ 98%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/src/optical_flow
_io.cpp.o
[ 99%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/src/sparse_match
ing_gpc.cpp.o
[ 99%] Built target opencv_cvv
[ 99%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/src/sparsetodens
eflow.cpp.o
[ 99%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/src/simpleflow.c
pp.o
[ 99%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/src/deepflow.cpp
.o
[ 99%] Building CXX object modules/optflow/CMakeFiles/opencv_optflow.dir/opencl_kernels_o
ptflow.cpp.o
[ 99%] Linking CXX shared library ../../lib/libopencv_optflow.so
[ 99%] Built target opencv_optflow
Scanning dependencies of target opencv_python2
Scanning dependencies of target opencv_python3
[ 99%] Building CXX object modules/python3/CMakeFiles/opencv_python3.dir/__/src2/cv2.cpp.
o
[100%] Building CXX object modules/python2/CMakeFiles/opencv_python2.dir/__/src2/cv2.cpp.
o
[100%] Linking CXX shared module ../../lib/python3/cv2.cpython-35m-x86_64-linux-gnu.so
[100%] Linking CXX shared module ../../lib/cv2.so
[100%] Built target opencv_python2
[100%] Built target opencv_python3
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ sudo make install
```

```
-- Installing: /usr/local/share/OpenCV/samples/python/logpolar.py
-- Installing: /usr/local/share/OpenCV/samples/python/opencv_version.py
-- Installing: /usr/local/share/OpenCV/samples/python/turing.py
-- Installing: /usr/local/share/OpenCV/samples/python/peopledetect.py
-- Installing: /usr/local/share/OpenCV/samples/python/find_obj.py
-- Installing: /usr/local/share/OpenCV/samples/python/houghlines.py
-- Installing: /usr/local/share/OpenCV/samples/python/lk_homography.py
-- Installing: /usr/local/share/OpenCV/samples/python/coherence.py
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ cat /etc/ld.so.conf.d/*
/usr/lib/x86_64-linux-gnu/libfakeroot
# Multiarch support
/lib/i386-linux-gnu
/usr/lib/i386-linux-gnu
/lib/i686-linux-gnu
/usr/lib/i686-linux-gnu
/usr/lib/i386-linux-gnu/mesa
# libc default configuration
/usr/local/lib
/usr/local/lib
# Multiarch support
/lib/x86_64-linux-gnu
/usr/lib/x86_64-linux-gnu
/usr/lib/x86_64-linux-gnu/mesa-egl
/usr/lib/x86_64-linux-gnu/mesa
# Legacy biarch compatibility support
/lib32
/usr/lib32
# Legacy biarch compatibility support
/libx32
/usr/libx32
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ sudo ldconfig
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ █
```

만약 /usr/local/lib 이 없다면
sudo sh –c 'echo '/usr/local/lib' > /etc/ld.so.conf.d/opencv.conf'

```
/usr/lib/x86
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ sudo ldconfig
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ pkg-config --modversion op
encv
3.4.0
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ pkg-config --libs --cflags
 opencv
-I/usr/local/include/opencv -I/usr/local/include -L/usr/local/lib -lopencv_stitching -lop
encv_superres -lopencv_videostab -lopencv_aruco -lopencv_bgsegm -lopencv_bioinspired -lop
encv_ccalib -lopencv_cvv -lopencv_dpm -lopencv_face -lopencv_photo -lopencv_freetype -lop
encv_fuzzy -lopencv_img_hash -lopencv_line_descriptor -lopencv_optflow -lopencv_reg -lope
ncv_rgbd -lopencv_saliency -lopencv_stereo -lopencv_structured_light -lopencv_phase_unwra
pping -lopencv_surface_matching -lopencv_tracking -lopencv_datasets -lopencv_text -lopenc
v_dnn -lopencv_plot -lopencv_xfeatures2d -lopencv_shape -lopencv_video -lopencv_ml -lopen
cv_ximgproc -lopencv_calib3d -lopencv_features2d -lopencv_highgui -lopencv_videoio -lopen
cv_flann -lopencv_xobjdetect -lopencv_imgcodecs -lopencv_objdetect -lopencv_xphoto -lopen
cv_imgproc -lopencv_core
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ ls /usr/local/share/OpenCV
/samples/cpp/facedetect.cpp
/usr/local/share/OpenCV/samples/cpp/facedetect.cpp
sdr@sdr-Samsung-DeskTop-System:~/sw/opencv/opencv-3.4.0/build$ █
```

만약 pkg-config 가 본연의 기능을 하지 못한다면
sudo sh –c 'echo PKG_CONFIG_PATH=$PKG_CONFIG_PATH:/usr/local/lib/pkgconfig >> /etc/bash.bashrc'
sudo sh –c 'echo export PKG_CONFIG_PATH >> /etc/bash.bashrc'

```
sdr@sdr-Samsung-DeskTop-System:~$ python3
Python 3.5.2 (default, Nov 23 2017, 16:37:01)
[GCC 5.4.0 20160609] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import cv2
cv>>> cv2.__version__
'3.4.0'
>>> quit()
sdr@sdr-Samsung-DeskTop-System:~$ █
```