Installing OpenCV from the Source

Building the OpenCV library from source is the recommended way of installing OpenCV. It will be optimized for your particular system and you will have complete control over the build options.

To install the latest OpenCV version from the source, perform the following steps:

1. Install the required dependencies:

```
sudo apt install build-essential cmake git pkg-config libgtk-3-dev \   libavcodec-dev libavformat-dev libswscale-dev libv4l-dev \   libxvidcore-dev libx264-dev libjpeg-dev libpng-dev libtiff-dev \ gfortran openexr libatlas-base-dev python3-dev python3-numpy \   libtbb2 libtbb-dev libdc1394-22-dev
```

2. Clone the OpenCV's and OpenCV contrib repositories:

```
mkdir ~/opencv_build && cd ~/opencv_build
git clone https://github.com/opencv/opencv.git
git clone https://github.com/opencv/opencv_contrib.git
```

At the time of writing, the default version in the github repositories is version 4.5.3. If you want to install an older version of OpenCV, cd to both `opencv` and `opencv_contrib` directories and run `git checkout <opencv-version>`

3. Once the download is complete, create a temporary build directory, and [switch](#) to it:

```
cd ~/opencv_build/opencv
mkdir build && cd build
```

Set up the OpenCV build with CMake:

```
cmake -D CMAKE_BUILD_TYPE=RELEASE \   -D CMAKE_INSTALL_PREFIX=/usr/local \   -D INSTALL_C_EXAMPLES=ON \   -D INSTALL_PYTHON_EXAMPLES=ON \   -D OPENCV_GENERATE_PKGCONFIG=ON \   -D OPENCV_EXTRA_MODULES_PATH=~/opencv_build/opencv_contrib/modules \   -D BUILD_EXAMPLES=ON ..
```

When the CMake build system is finalized, you will see something like below:

```
    Include path:                 /home/vagrant/opencv_build/opencv/3rdparty/include/opencl/1.2
    Link libraries:               Dynamic load

  Python 3:
    Interpreter:                  /usr/bin/python3 (ver 3.6.5)
    Libraries:                    /usr/lib/x86_64-linux-gnu/libpython3.6m.so (ver 3.6.5)
    numpy:                        /usr/lib/python3/dist-packages/numpy/core/include (ver 1.13.3)
    packages path:                lib/python3.6/dist-packages

  Python (for build):             /usr/bin/python3

  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/vagrant/opencv_build/opencv/build
```

4. Start the compilation process:

```
make -j8
```

Modify the `-j` flag according to your processor. If you do not know the number of cores in your processor, you can find it by typing `nproc`.

The compilation may take several minutes or more, depending on your system configuration. Once it is completed you will see something like below:

```
Scanning dependencies of target example_tapi_pyrlk_optical_flow
[100%] Building CXX object samples/tapi/CMakeFiles/example_tapi_pyrlk_optical_flow.dir/pyrlk_optical_flow.cpp.o
[100%] Linking CXX executable ../../bin/example_tapi_pyrlk_optical_flow
[100%] Built target example_tapi_pyrlk_optical_flow
Scanning dependencies of target example_tapi_squares
[100%] Building CXX object samples/tapi/CMakeFiles/example_tapi_squares.dir/squares.cpp.o
[100%] Linking CXX executable ../../bin/example_tapi_squares
[100%] Built target example_tapi_squares
Scanning dependencies of target example_tapi_ufacedetect
[100%] Building CXX object samples/tapi/CMakeFiles/example_tapi_ufacedetect.dir/ufacedetect.cpp.o
[100%] Linking CXX executable ../../bin/example_tapi_ufacedetect
[100%] Built target example_tapi_ufacedetect
```

5. Install OpenCV with:

```
sudo make install
```

```
-- Installing: /usr/local/share/OpenCV/samples/python/peopledetect.py
-- Installing: /usr/local/share/OpenCV/samples/python/plane_ar.py
-- Installing: /usr/local/share/OpenCV/samples/python/plane_tracker.py
-- Installing: /usr/local/share/OpenCV/samples/python/squares.py
-- Installing: /usr/local/share/OpenCV/samples/python/stereo_match.py
-- Installing: /usr/local/share/OpenCV/samples/python/texture_flow.py
-- Installing: /usr/local/share/OpenCV/samples/python/tst_scene_render.py
-- Installing: /usr/local/share/OpenCV/samples/python/turing.py
-- Installing: /usr/local/share/OpenCV/samples/python/video.py
-- Installing: /usr/local/share/OpenCV/samples/python/video_threaded.py
-- Installing: /usr/local/share/OpenCV/samples/python/video_v4l2.py
-- Installing: /usr/local/share/OpenCV/samples/python/watershed.py
```

6. To verify whether OpenCV has been installed successfully, type the following command and you should see the OpenCV version:

```
pkg-config --modversion opencv4
```

```
4.2.0
```

```
python3 -c "import cv2; print(cv2.__version__)"
```

4.2.0-dev