# Installing OpenCV on Linux

Install the packages as shown below. They are required for OpenCV to build. This list is not exhaustive and other packages may need to be installed.

```
~$ sudo apt install libgtk2.0-dev pkg-config cmake
```

Run the following commands to download and build OpenCV:

```
~$ git clone https://gitcode.net/opencv/opencv.git
~$ cd opencv
~/opencv$ mkdir build && cd build
~/opencv/build$ cmake ..
~/opencv/build$ cmake --build .
~/opencv/build$ sudo make install
~/opencv/build$ sudo ldconfig
```

The first cmake command configures the project files and generates the files needed for building. The second cmake command builds the project and generates some executable files. The final make installs the header files to `/usr/local/include/opencv4` and the library files to `/usr/local/lib`. The last command updates the shared library cache on Linux for dynamically linked libraries. If you need to rebuild OpenCV, restart this process from the fourth command (`cmake ..`) command.

The following command can be used to compile a program (`main.cpp`) using the opencv library:

```
~$ g++ -I/usr/local/include/opencv4 -L/usr/local/lib -o program.exe
main.cpp -lopencv_core
```

You may need to include more than just the core module in your compile command if your project requires it.

```
~$ g++ -I/usr/local/include/opencv4 -L/usr/local/lib -o program.exe
main.cpp -lopencv_core -lopencv_imgproc
```

If you want to build the OpenCV example included in the Apriltags library, you need to create a package config file for OpenCV. To do this, create a file named `opencv4.pc` in `/usr/lib/pkgconfig` (or copy it from the Github repository) and add the following to it:

```
prefix=/usr/local
libdir=${prefix}/lib
includedir=${prefix}/include

Name: opencv4
Description: OpenCV
Version: 4.8.0
Libs: -L${libdir} -lopencv_core -lopencv_calib3d -lopencv_dnn
-lopencv_features2d -lopencv_flann -lopencv_gapi -lopencv_highgui
-lopencv_imgcodecs -lopencv_imgproc -lopencv_ml -lopencv_objdetect
-lopencv_photo -lopencv_stitching -lopencv_videoio -lopencv_video
Cflags: -I${includedir}/opencv4
```

Package config can be used to make the compile command cleaner. The command below includes all OpenCV modules and is much easier to look at.

```
~$ g++ -I.. `pkg-config --cflags opencv4` -o program main.cpp `pkg-config
--libs opencv4`
```