

OpenCV 4.0.1-Contrib on WIN10 (C++ and Python)

Step by step tutorial

Kefei mo

GitHub:

<https://github.com/kefeimo/OpenCV-4.0.1-contrib-install-for-WIN10>

YouTube:

Outline

Step1: Download all the software and the OpenCV libraries

Step2: Software installation and extraction

Step3: Build C++ projects using CMake

- 3.1 choose source and binaries directories

- 3.2 additional change

- 3.3 generate build files

Step4: Compile OpenCV

- 4.1 build debug version for ALL_BUILD

- 4.2 build release version for ALL_BUILD

- 4.3 build release version for INSTALL

- 4.4 build release version for INSTALL

Step5: Update environment variables

- 5.1 environment variable – PATH

- 5.2 user environment variable – OPENCV_DIR

Step6: Test the compiled OpenCV (in C++)

- 6.1 build a test project using CMake

- 6.2 build and execute in Visual Studio

Step1: Download all the software and the OpenCV libraries

List

1. Visual studio 14 2015 X64 community

https://my.visualstudio.com/Downloads?q=visual%20studio%202015&wt.mc_id=o~msft~vscom~older-downloads

2. CMake cmake-3.13.2-win64-x64.msi

<https://cmake.org/download/>

3. Anaconda Python 3.7 version for Windows installers

<https://www.anaconda.com/download/>

4. OpenCV 4.0.1 source code (ZIP)

<https://github.com/opencv/opencv/releases>

5. Opencv-contrib 4.0.1 source code (ZIP)

https://github.com/opencv/opencv_contrib/releases

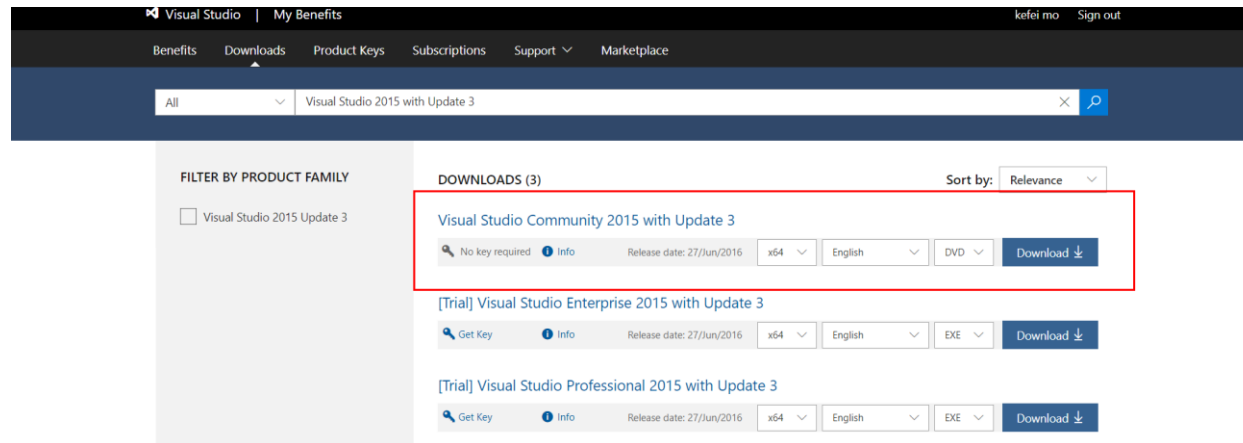
Note: highly recommend to download the exact version

Step1: Download all the software and the OpenCV libraries

List

1. Visual studio 14 2015 X64 community (free to download after sign in Dev Essentials)

https://my.visualstudio.com/Downloads?q=visual%20studio%202015&wt.mc_id=o~msft~vscom~older-downloads



sign in Visual Studio Dev Essentials:

<https://my.visualstudio.com/Downloads?q=Visual%20Studio%202015%20with%20Update%203>

Step1: Download all the software and the OpenCV libraries

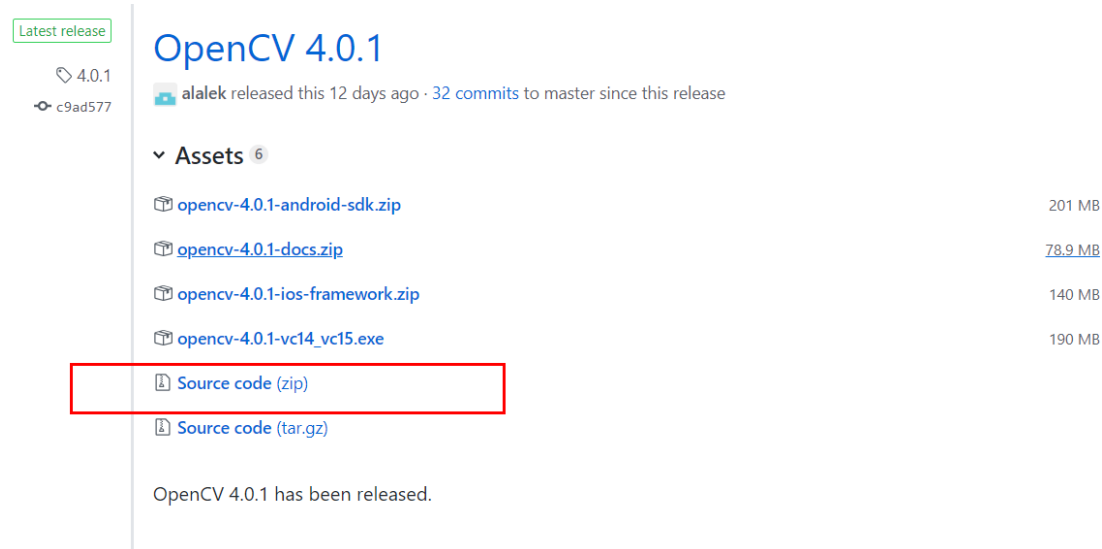
List

4. OpenCV 4.0.1 source code (ZIP)

<https://github.com/opencv/opencv/releases>

5. Opencv-contrib 4.0.1 source code (ZIP)

https://github.com/opencv/opencv_contrib/releases



Latest release

4.0.1

c9ad577

OpenCV 4.0.1

alalek released this 12 days ago · 32 commits to master since this release

Assets 6

opencv-4.0.1-android-sdk.zip	201 MB
opencv-4.0.1-docs.zip	78.9 MB
opencv-4.0.1-ios-framework.zip	140 MB
opencv-4.0.1-vc14_vc15.exe	190 MB
Source code (zip)	
Source code (tar.gz)	

OpenCV 4.0.1 has been released.

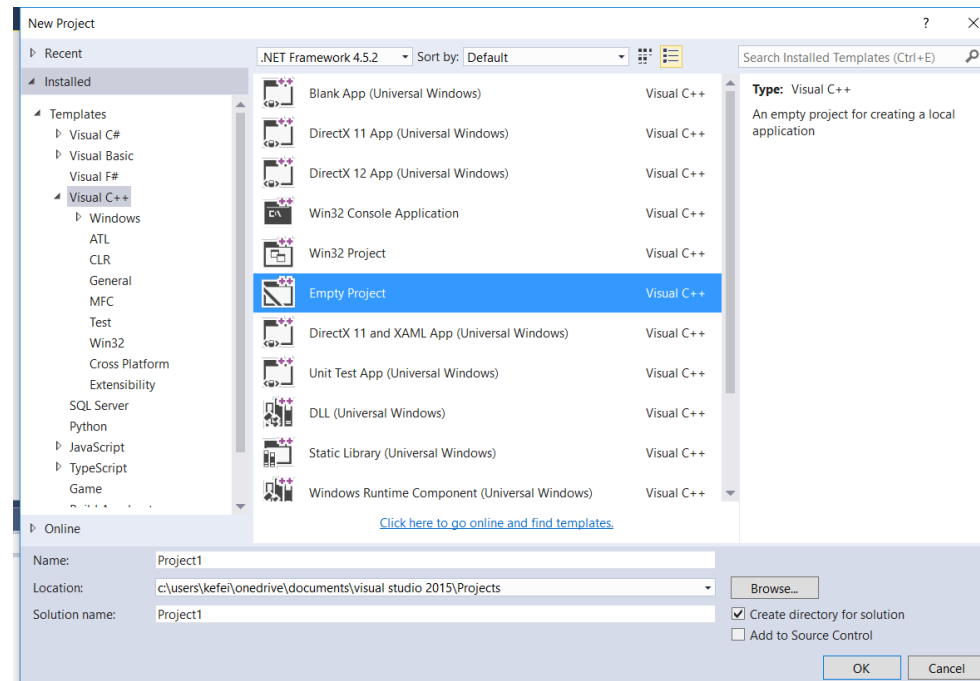
Note: highly recommend to download the exact version,
Use “Next” button to find former versions if necessary

Step2: Software installation and extraction

List

1. Visual studio 14 2015 X64 community (with VC++ compiler)

Note: remember to install Visual C++ compiler. To test, build an empty VC++ project

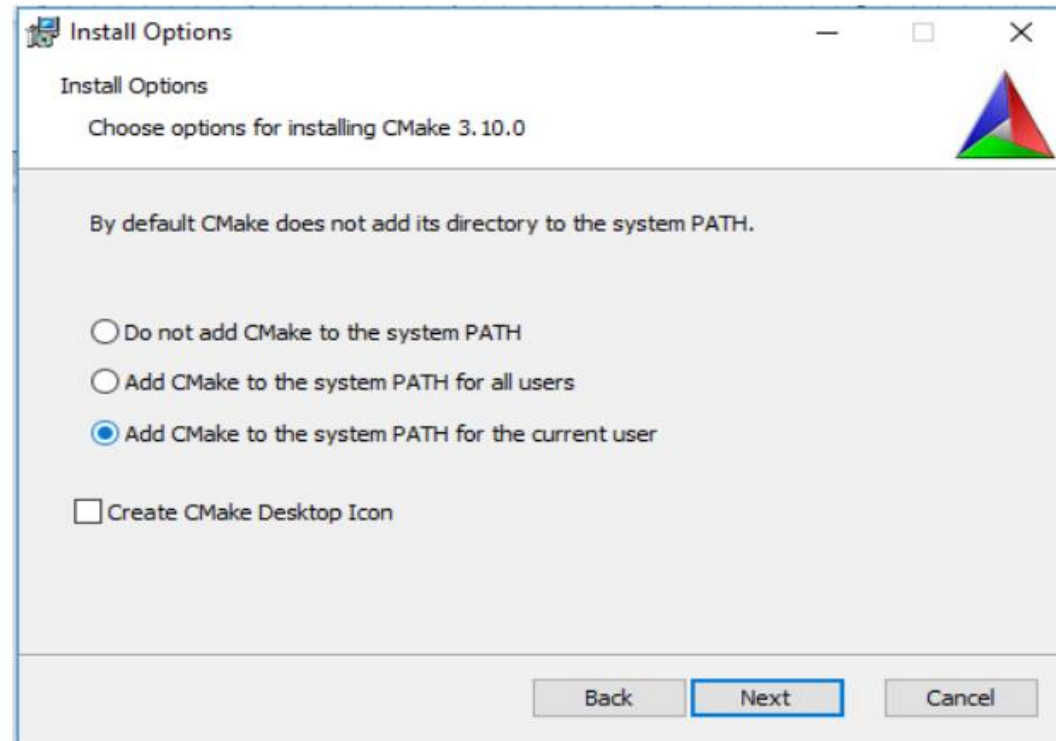


Step2: Software installation and extraction

List

2. CMake cmake-3.13.2-win64-x64.msi

Note: choose “Add CMake to system PATH for the current user”

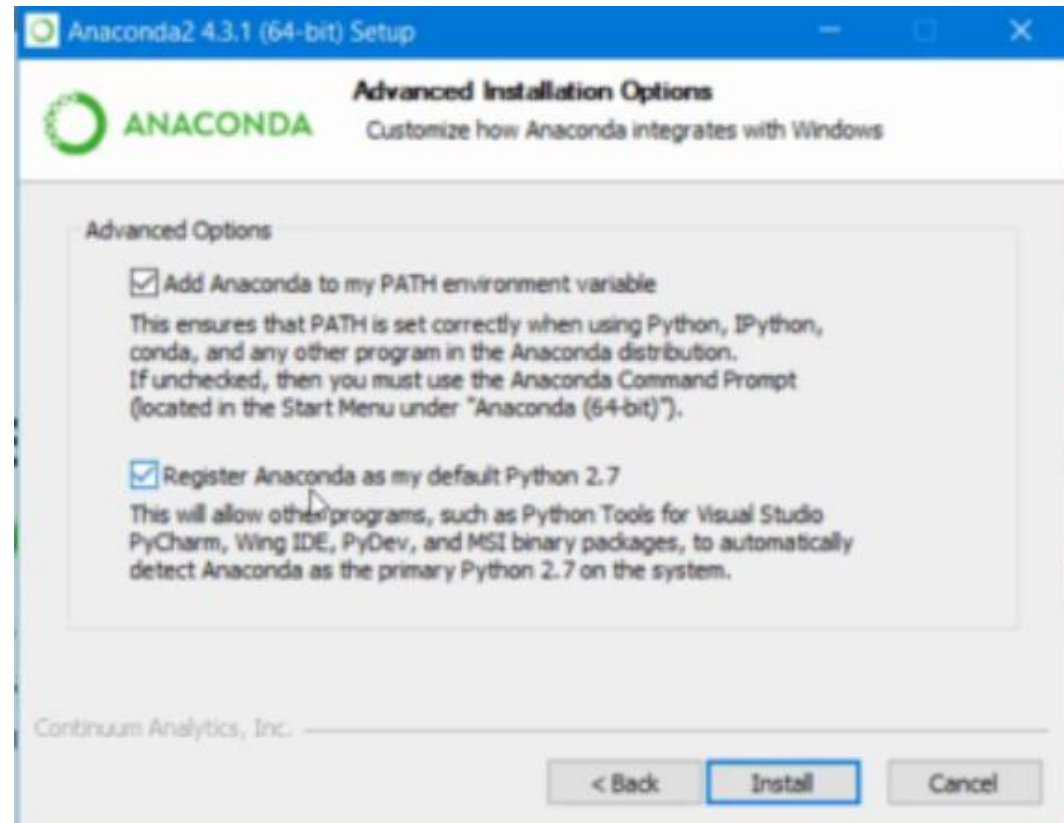


Step2: Software installation and extraction

List

3. Anaconda Python 3.7 version for Windows installers

Note: check both for advanced options



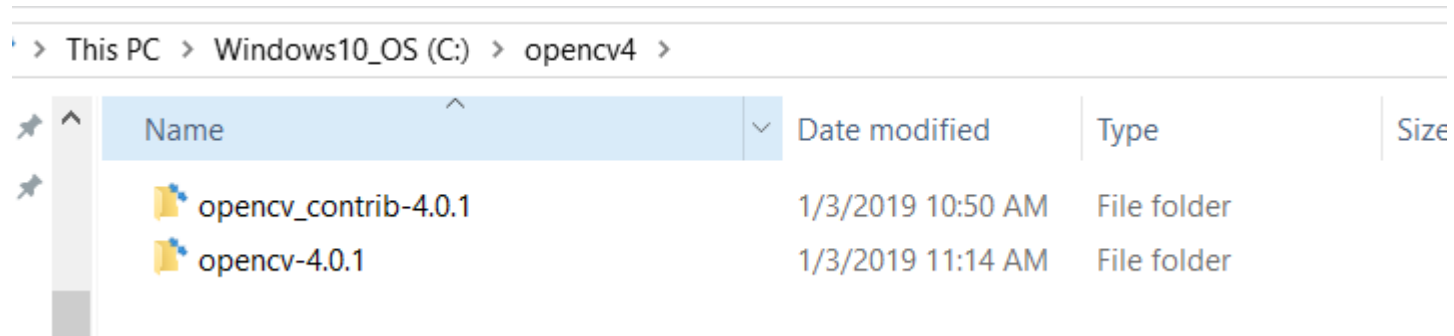
Step2: Software installation and extraction

List

4. OpenCV 4.0.1 source code (ZIP)

5. OpenCV-contrib 4.0.1 source code (ZIP)

Note: recommend to extract the OpenCV 4.0.1 and OpenCV-contrib 4.0.1 in the same folder.



The screenshot shows a Windows File Explorer window with the address bar displaying the path: > This PC > Windows10_OS (C:) > opencv4 >. The main area displays a table of files and folders.

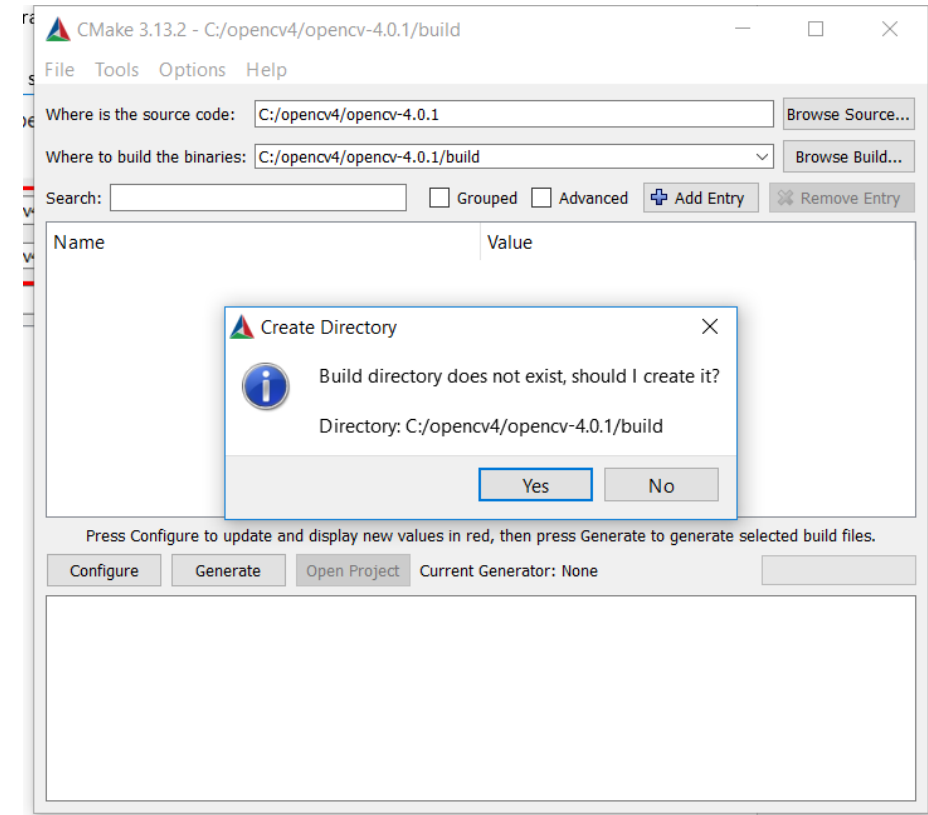
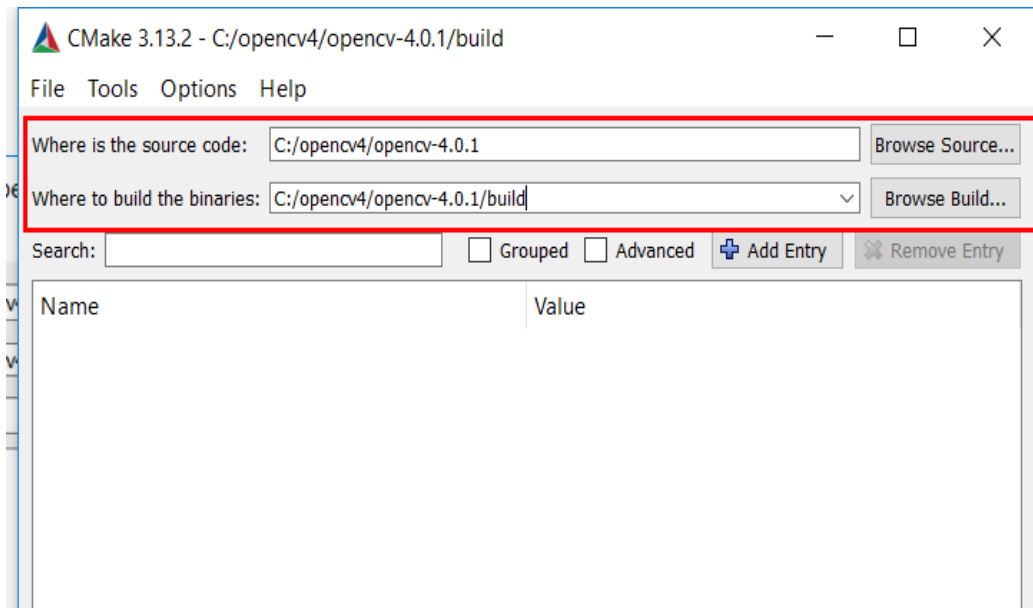
Name	Date modified	Type	Size
opencv_contrib-4.0.1	1/3/2019 10:50 AM	File folder	
opencv-4.0.1	1/3/2019 11:14 AM	File folder	

Step3: Build C++ projects using CMake

3.1 choose source code and binaries directories

step:

- Use "browse source" button, and make sure the address use "/" instead of "\", then click "configure"
- the binaries fold is new build, would be asked for permission, click yes
- Success result and potential error see next

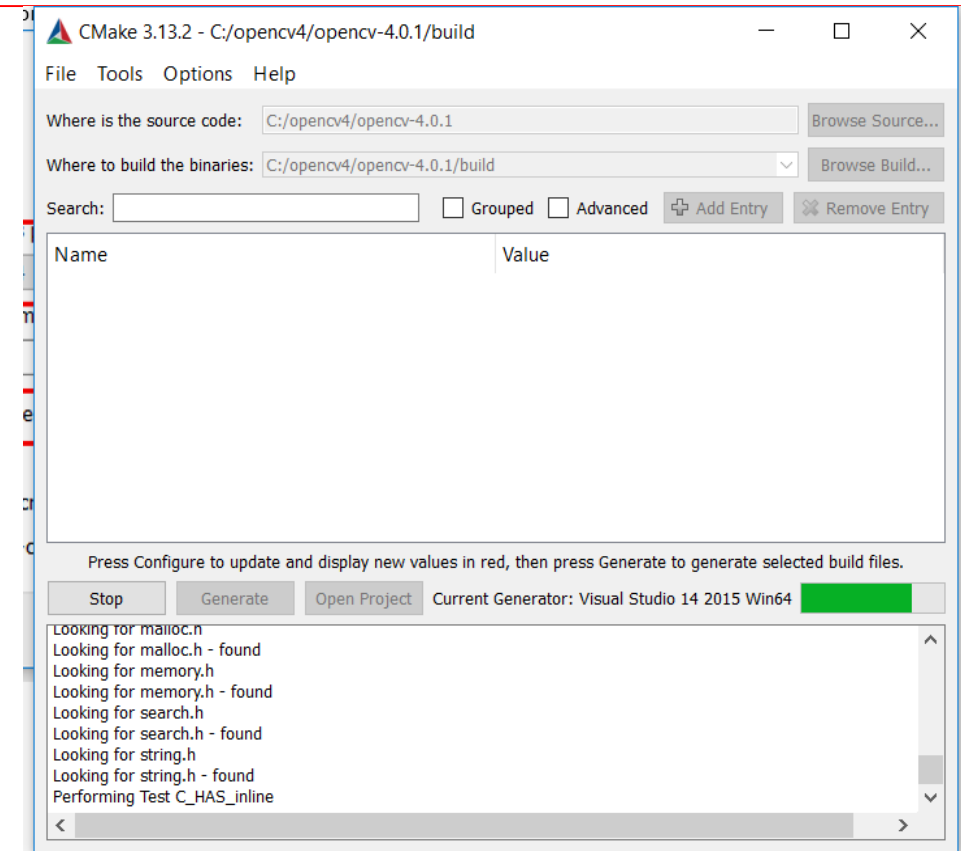
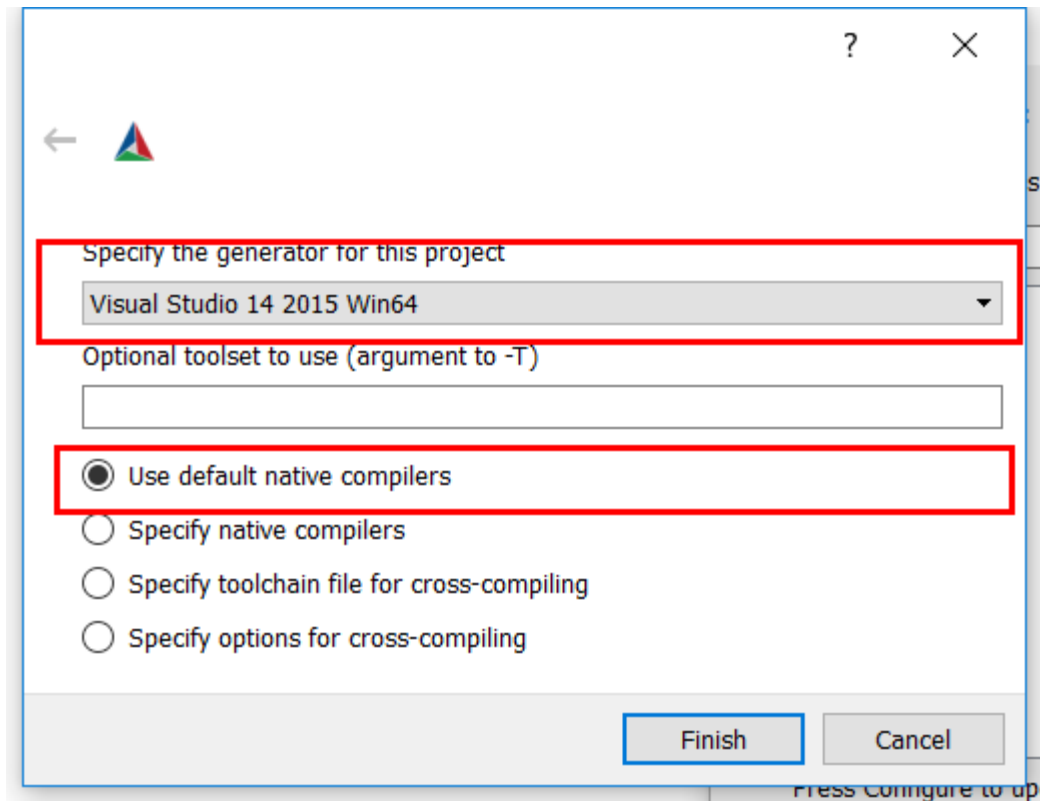


Step3: Build C++ projects using CMake

3.1 choose source code and binaries directories

step :

- Will be asked to specify compiler. Note: if the compiler has been installed correctly, it will automatically choose the compiler (normally the newest version). Here we would like to use visual studio 2015 x64. However, if newer version has been installed, i.e. visual studio 2017, then, specify to visual studio 2015 x64. note: “Visual Studio 14 2015 WIN64” means Visual Studio 2015, “Visual Studio 15 2017” means Visual Studio 2017
- Then choose “use default native compilers”, then click “Finish”
- Start configuring, would take a while (there is progress bar to see the percentage)

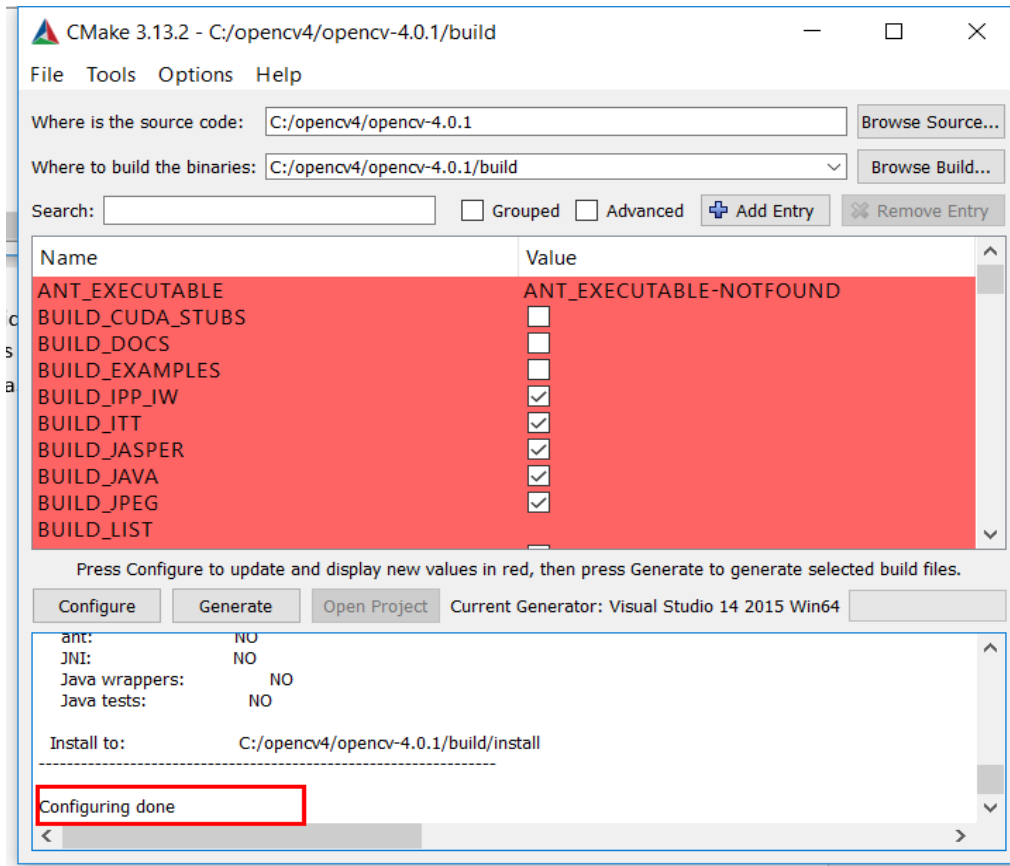


Step3: Build C++ projects using CMake

3.1 choose source code and binaries directories

Result : as shown

Note: the salmon color items are configuration changed, don't freak out seeing them.

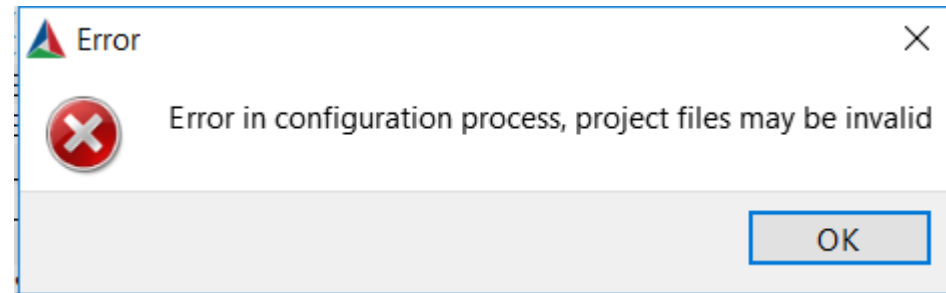


Step3: Build C++ projects using CMake

3.1 choose source code and binaries directories

Potential errors :

- “project files may be invalid”, reason: didn’t download opencv source file (ZIP) correctly, or the address of “where is the source code” is wrong. (another sub-directory after extraction)
- “cannot find compiler”, reason: didn’t install vc++ compiler (only install visual studio)

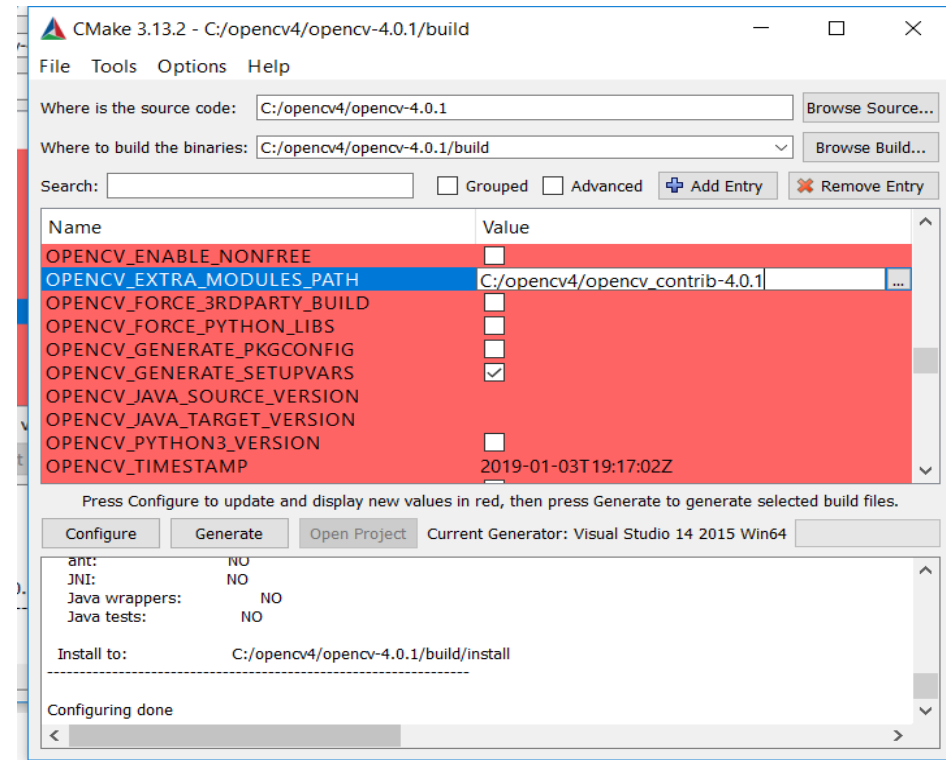
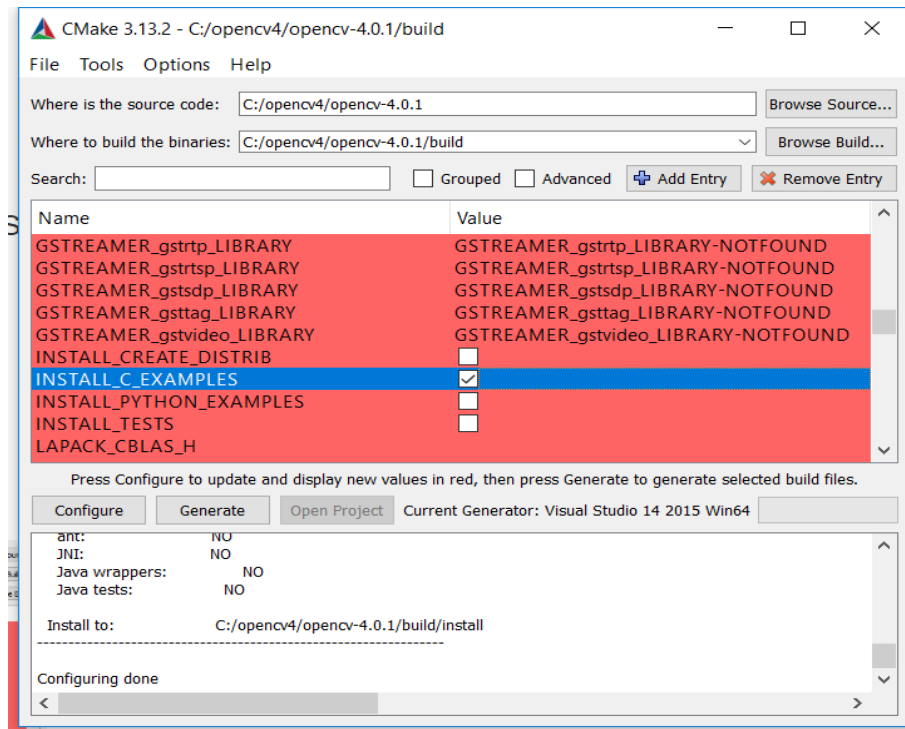


Step3: Build C++ projects using CMake

3.2 additional change (2nd time configure)

step:

- check “INSTALL_C_EXAMPLES”
- Specify path to “OPENCV_EXTRA_MODULES_PATH” (note: here the path is wrong, should have use “C:\opencv4\opencv_contrib-4.0.1\modules”)

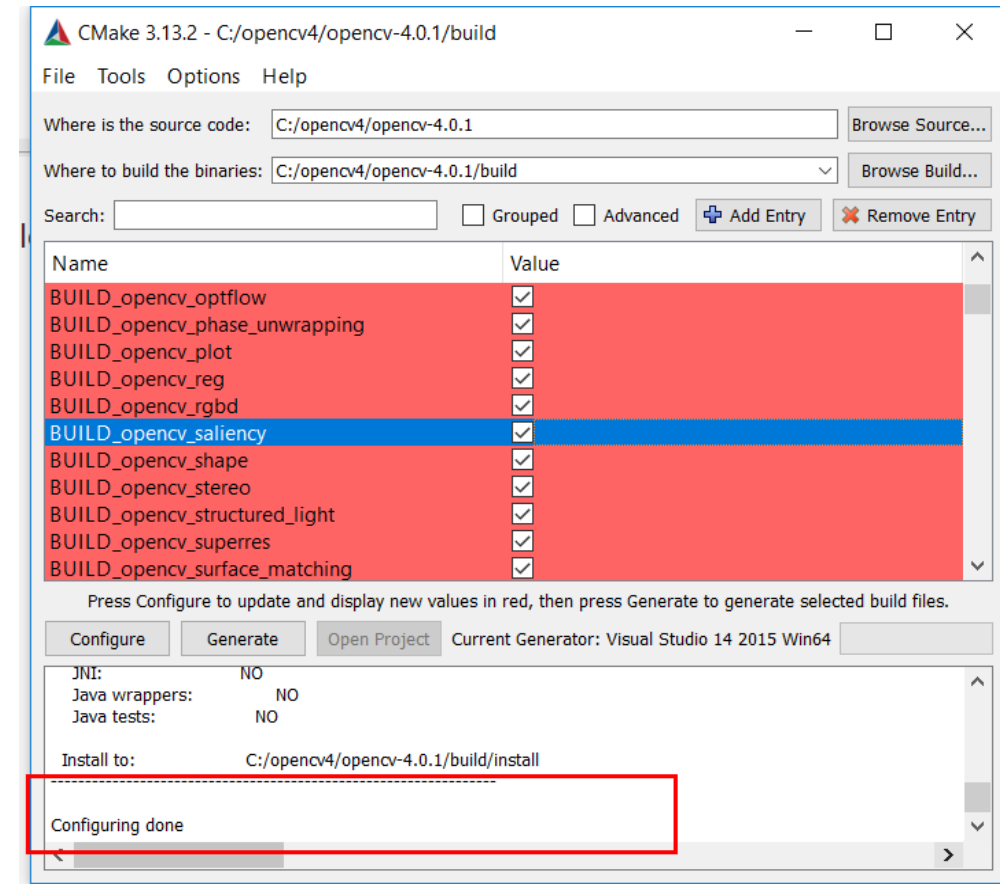
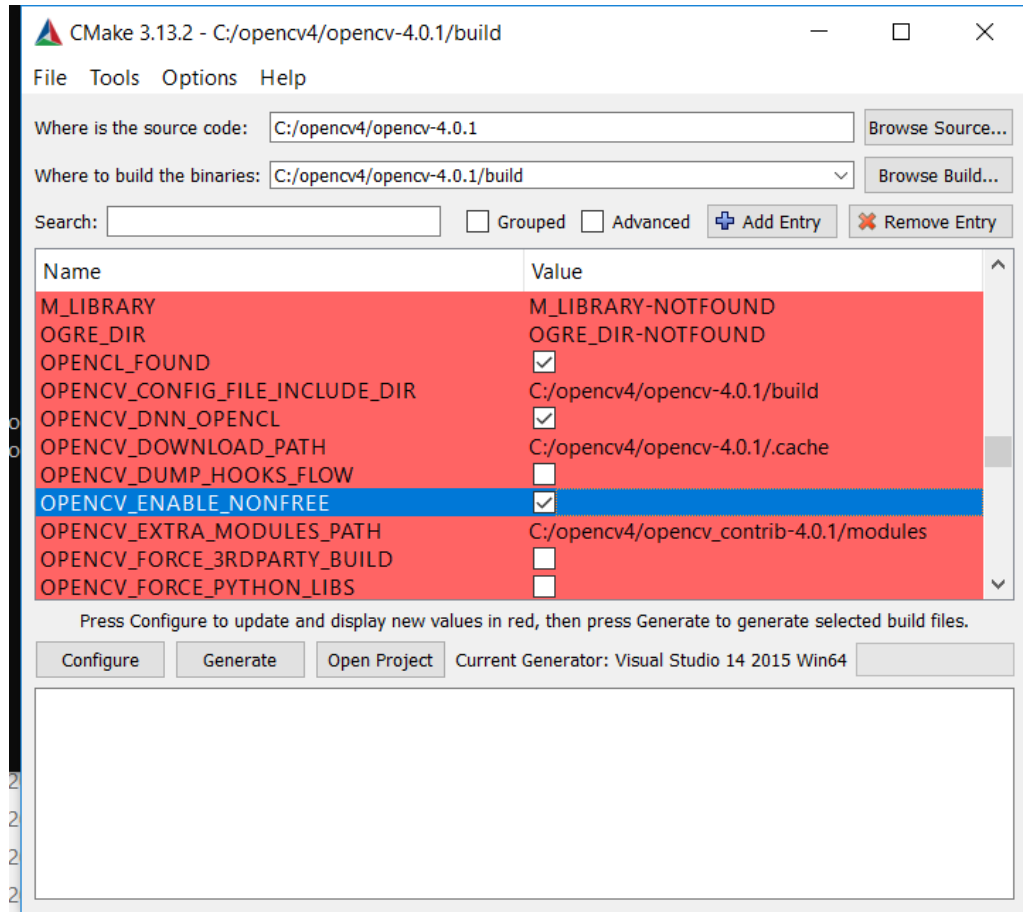


Step3: Build C++ projects using CMake

3.2 additional change (2nd time configuration)

step:

- check "OPENCV_ENABLE_NONFREE" (if not found, it might appear after 2nd configuration, or even later. Just keep in mind to check this option when it appears).
- Then click "Configure". If no error, it would show configuring done

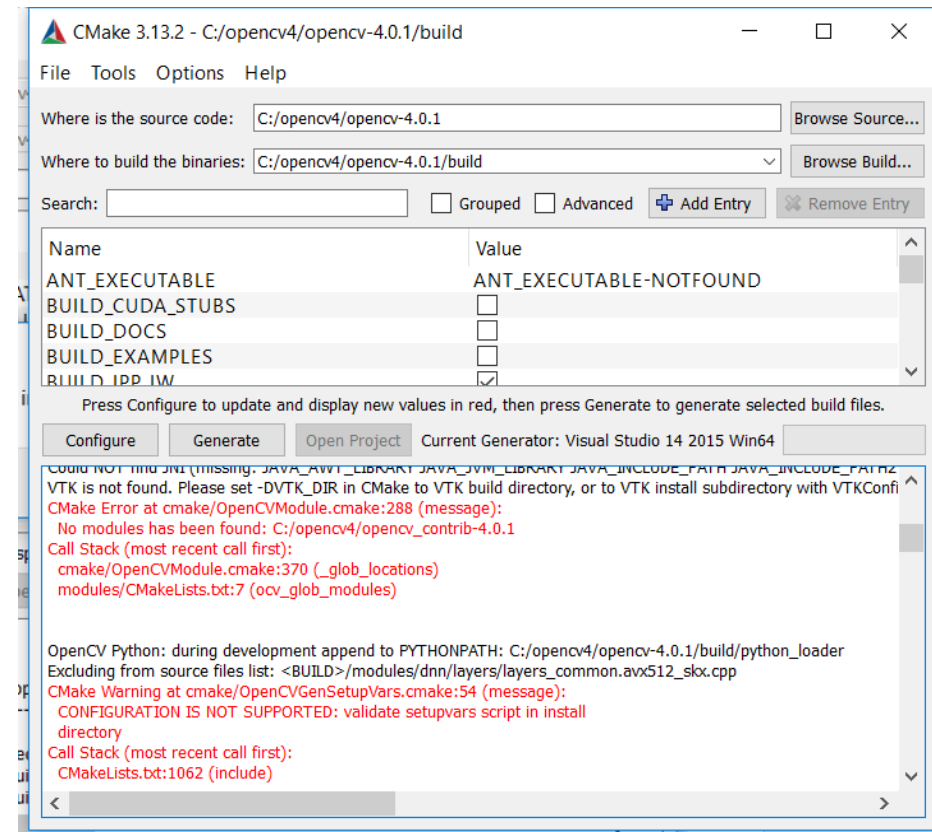
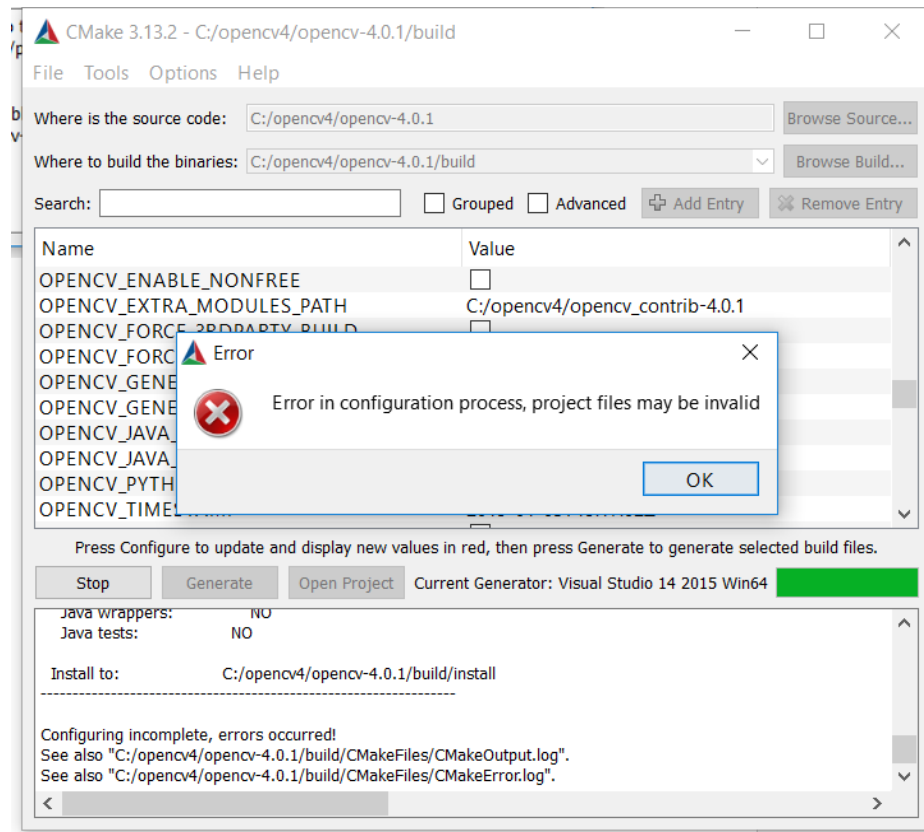


Step3: Build C++ projects using CMake

3.2 additional change (2nd time configuration)

Potential error

Reason: didn't choose the right contrib directory (should have used “/modules” folder”

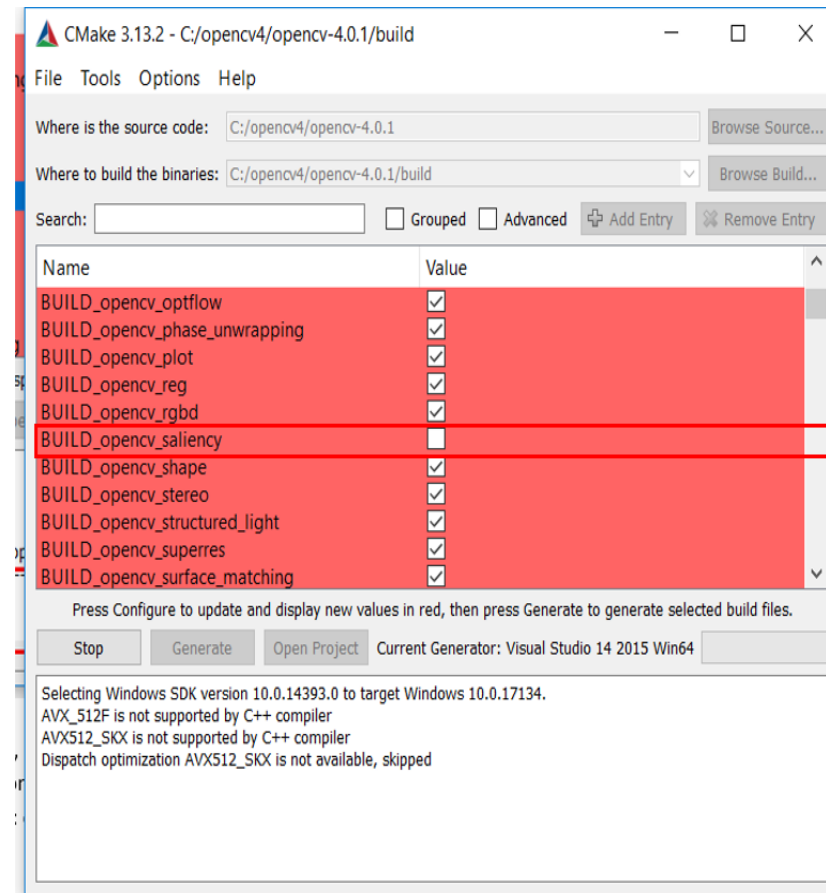


Step3: Build C++ projects using CMake

3.2 additional change (3rd time configuration)

step:

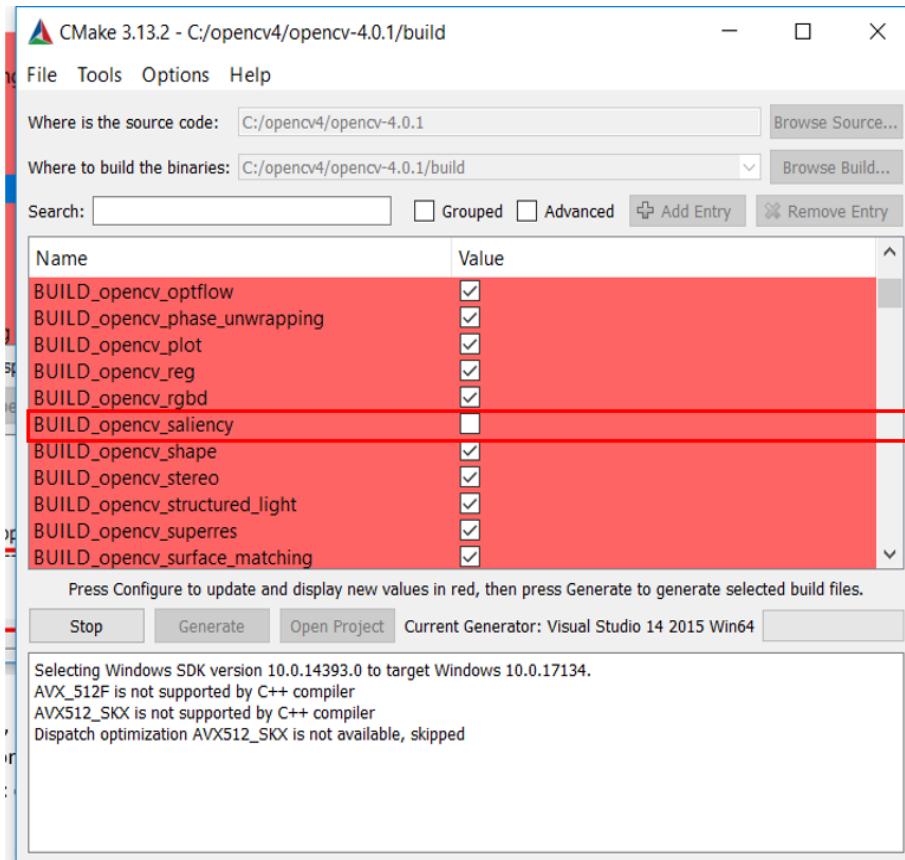
- **UNcheck** "BUILD_opencv_saliency". Note: (this option didn't show at the first and second configuration; the reason to check that is this open show would make compilation error for WIN10)
- Then click "configure" again, this is the 3rd time configuration



Step3: Build C++ projects using CMake

3.3 generate

- step:
- click “generate”
- Result:
- After clicking “generate”, there would be more file generated in “/build”. Especially, there should be a file called “OpenCV.sln”
- Note:
- check point: if “OpenCV.sln” is generated
 - Don't close Cmake yet, might need it later



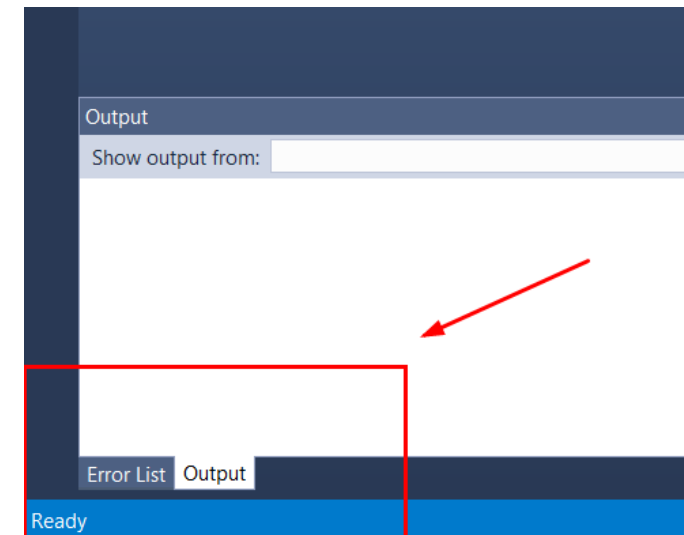
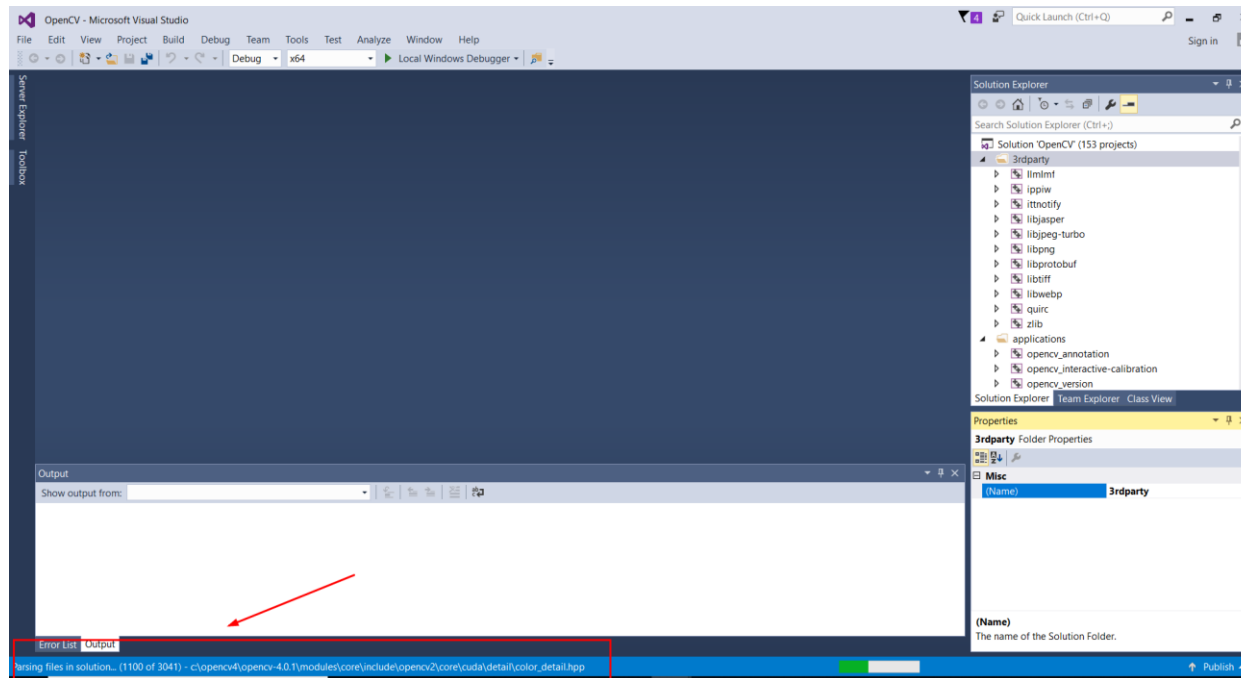
Name	Date modified	Type	Size
CPackConfig.cmake	1/3/2019 12:07 PM	CMAKE File	10 KB
CPackSourceConfig.cmake	1/3/2019 12:07 PM	CMAKE File	11 KB
CTestTestfile.cmake	1/3/2019 12:17 PM	CMAKE File	1 KB
custom_hal.hpp	1/3/2019 11:16 AM	C/C++ Header	1 KB
cv_cpu_config.h	1/3/2019 11:17 AM	C/C++ Header	1 KB
cvconfig.h	1/3/2019 11:17 AM	C/C++ Header	5 KB
INSTALL.vcxproj	1/3/2019 12:17 PM	VC++ Project	7 KB
INSTALL.vcxproj.filters	1/3/2019 12:17 PM	VC++ Project Filte...	1 KB
OpenCV.sln	1/3/2019 12:17 PM	Microsoft Visual St...	209 KB
opencv_data_config.hpp	1/3/2019 11:17 AM	C/C++ Header	1 KB
opencv_modules.vcxproj	1/3/2019 12:17 PM	VC++ Project	35 KB
opencv_modules.vcxproj.filters	1/3/2019 12:17 PM	VC++ Project Filte...	1 KB
opencv_perf_tests.vcxproj	1/3/2019 12:17 PM	VC++ Project	27 KB
opencv_perf_tests.vcxproj.filters	1/3/2019 12:17 PM	VC++ Project Filte...	1 KB
opencv_python_config.cmake	1/3/2019 12:17 PM	CMAKE File	2 KB
opencv_tests.vcxproj	1/3/2019 12:17 PM	VC++ Project	32 KB
opencv_tests.vcxproj.filters	1/3/2019 12:17 PM	VC++ Project Filte...	1 KB

Step4: Compile OpenCV

4.1 build release version for ALL_BUILD

step:

- open “/build/OpenCV.sln”. (It should automatically open in visual studio 2015.)
It might take a while initializing, wait until it says “ready”



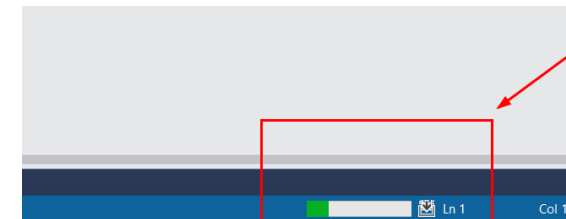
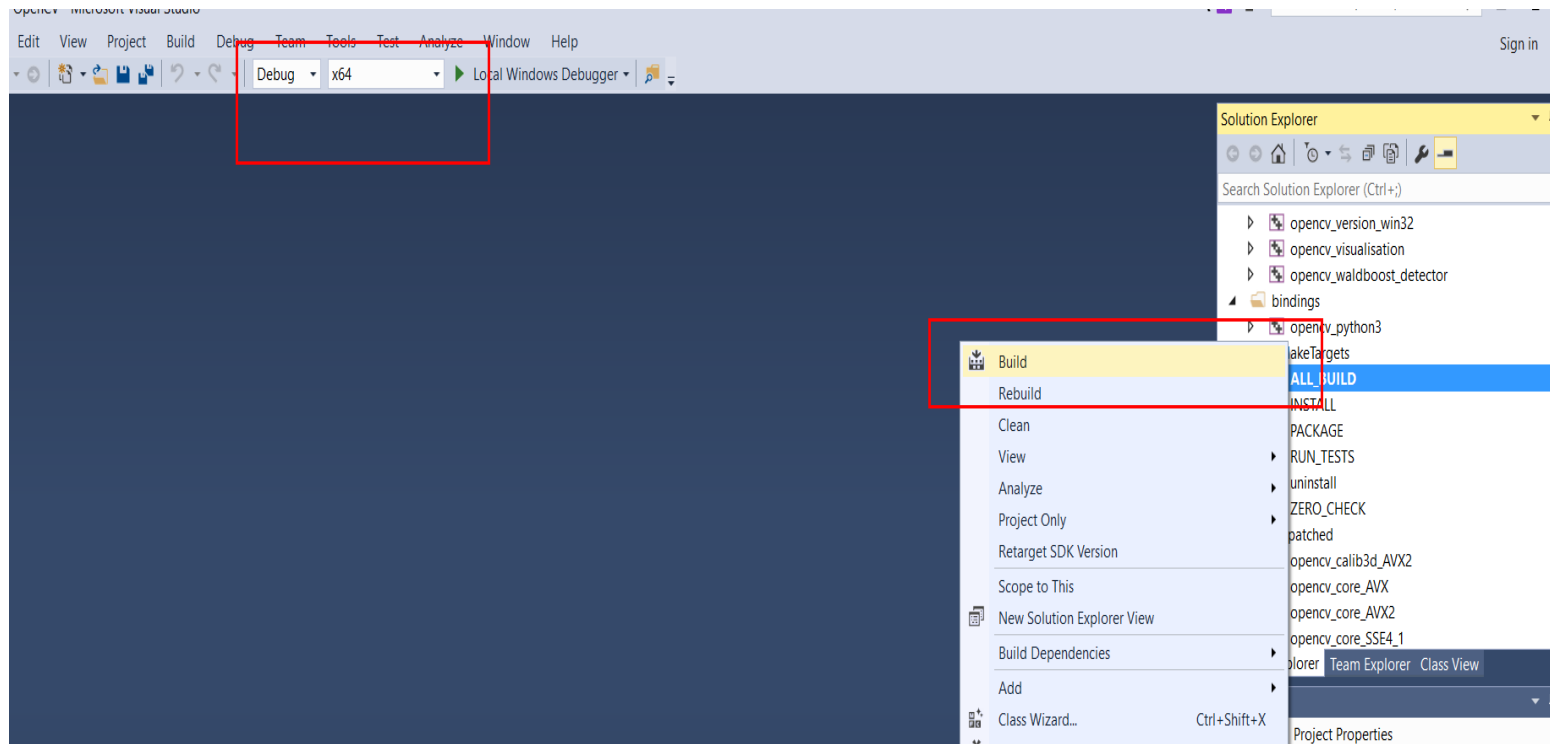
Step4: Compile OpenCV

4.1 build debug version for ALL_BUILD

step:

- At the “solution explorer” window, there are should be a project named “ALL_BUILD” under “CMake Targets”.
- Build project: under “debug”, “X64”, right click “ALL_BUILD”, and click “build”. (Note: must be under “debug”, “X64”, if “X64” not exist, see potential error and solution later).

Note: this process may take 10 to 20 minutes. Luckily we have the progress bar to see the progress.



Step4: Compile OpenCV

4.1 build debug version for ALL_BUILD

result:

- After this is done, a new folder named “lib” under “/build” would be created (assuming that the binary address is at “/build”).
- And under “lib”, there is a folder called “debug” with several “.lib” files

data	1/3/2019 12:17 PM	File folder
doc	1/3/2019 12:17 PM	File folder
downloads	1/3/2019 12:06 PM	File folder
include	1/3/2019 12:17 PM	File folder
lib	1/3/2019 12:40 PM	File folder
modules	1/3/2019 12:32 PM	File folder
opencv2	1/3/2019 12:14 PM	File folder
python_loader	1/3/2019 11:16 AM	File folder
samples	1/3/2019 12:17 PM	File folder
testdata	1/3/2019 12:07 PM	File folder
test-reports	1/3/2019 11:17 AM	File folder
.	1/3/2019 12:11 PM	File folder

C > Windows8_OS (C:) > opencv4 > opencv-4.0.1 > build > lib > Debug			
Name	Date modified	Type	Size
ade.lib	1/3/2019 12:33 PM	Object File Library	45,027 KB
ade.pdb	1/3/2019 12:33 PM	Program Debug D...	3,404 KB
opencv_aruco401d.exp	1/3/2019 12:38 PM	Exports Library File	152 KB
opencv_aruco401d.lib	1/3/2019 12:38 PM	Object File Library	254 KB
opencv_aruco401d.pdb	1/3/2019 12:38 PM	Program Debug D...	2,332 KB
opencv_bgsegm401d.exp	1/3/2019 12:39 PM	Exports Library File	154 KB
opencv_bgsegm401d.lib	1/3/2019 12:39 PM	Object File Library	258 KB
opencv_bgsegm401d.pdb	1/3/2019 12:39 PM	Program Debug D...	2,020 KB
opencv_bioinspired401d.exp	1/3/2019 12:35 PM	Exports Library File	97 KB
opencv_bioinspired401d.lib	1/3/2019 12:35 PM	Object File Library	166 KB
opencv_bioinspired401d.pdb	1/3/2019 12:35 PM	Program Debug D...	1,796 KB
opencv_calib3d401d.exp	1/3/2019 12:37 PM	Exports Library File	169 KB
opencv_calib3d401d.lib	1/3/2019 12:37 PM	Object File Library	285 KB
opencv_calib3d401d.pdb	1/3/2019 12:37 PM	Program Debug D...	3,852 KB
opencv_ccalib401d.exp	1/3/2019 12:39 PM	Exports Library File	159 KB
opencv_ccalib401d.lib	1/3/2019 12:39 PM	Object File Library	268 KB

Step4: Compile OpenCV

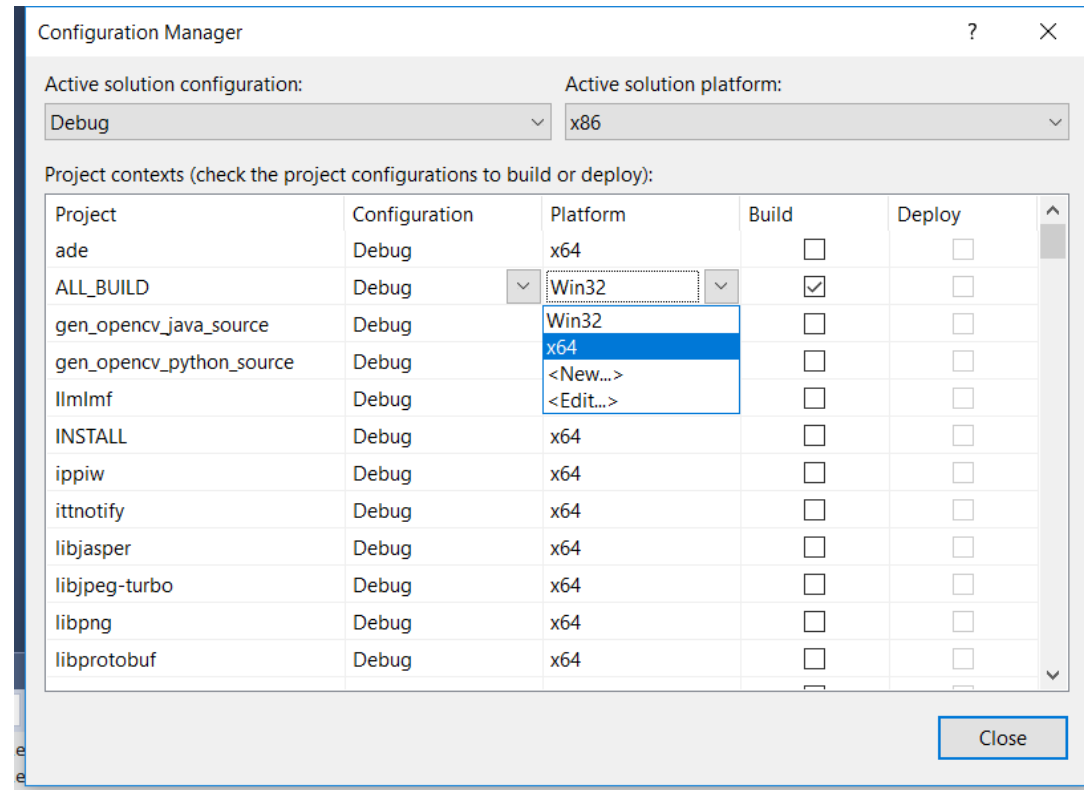
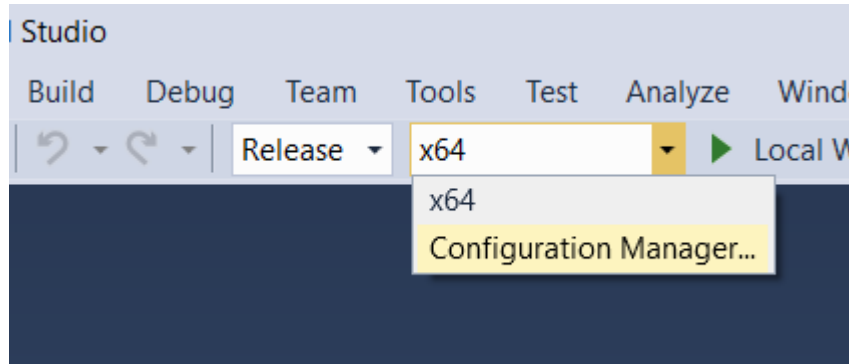
4.1 build debug version for ALL_BUILD

Potential error:

- Cannot find "X64"

Solution:

Configuration manager -> Platform -> choose "x64", or "new" (if "x64 is not there) -> "x64"



Step4: Compile OpenCV




4.2 build release version for ALL_BUILD

step:

- Same “ALL_BUILD” under “CMake Targets”.
- Build project: under “release”, “X64”, right click “ALL_BUILD”, and click “build”.

result:

- After it is done, a new folder named “release” would appear in “lib” folder (the python3 might be there as well, don't worry about that)

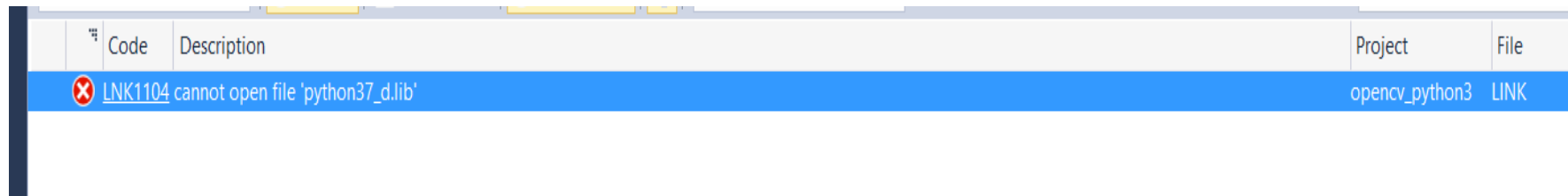
view		
is PC > Windows8_OS (C:) > opencv4 > opencv-4.0.1 > build > lib >		
Name	Date modified	Type
 Debug	1/3/2019 12:41 PM	File fo
 python3	1/3/2019 12:40 PM	File fo
 Release	1/3/2019 1:02 PM	File fo

Step4: Compile OpenCV

4.3 build release version for “INSTALL”

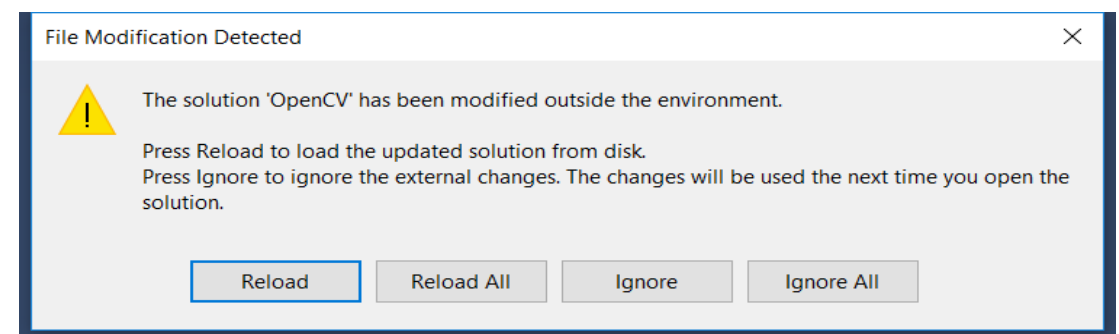
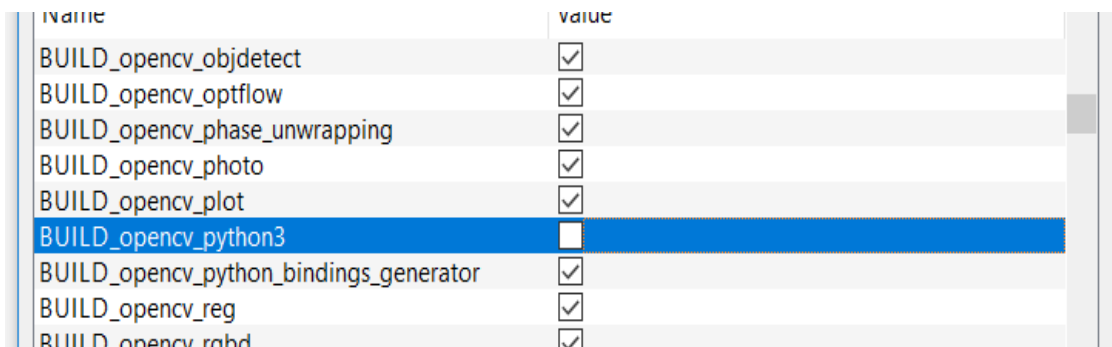
step:

- for “INSTALL” under “CMake Targets”.
- Build project: under “release”, “X64”, right click “INSTALL”, and click “build”.
- It is likely to encounter an error here.



Solution step:

- Go back to Cmake (that's why we didn't close it), uncheck “BUILD_opencv_python3”.
- Click “configure”, then click “generate”
- In Visual studio, it will ask you to reload (so you don't have to restart the whole program), choose “reload all”, and it would initialize again.
- Try to build again for “INSTALL”.



Step4: Compile OpenCV

4.4 build debug version for “INSTALL”

step:

- for same “INSTALL” Build project: under “release”, “X64”, right click “INSTALL”, and click “build”.

Result:

- Now we have a new created folder called “install”, later we will use this address for several times

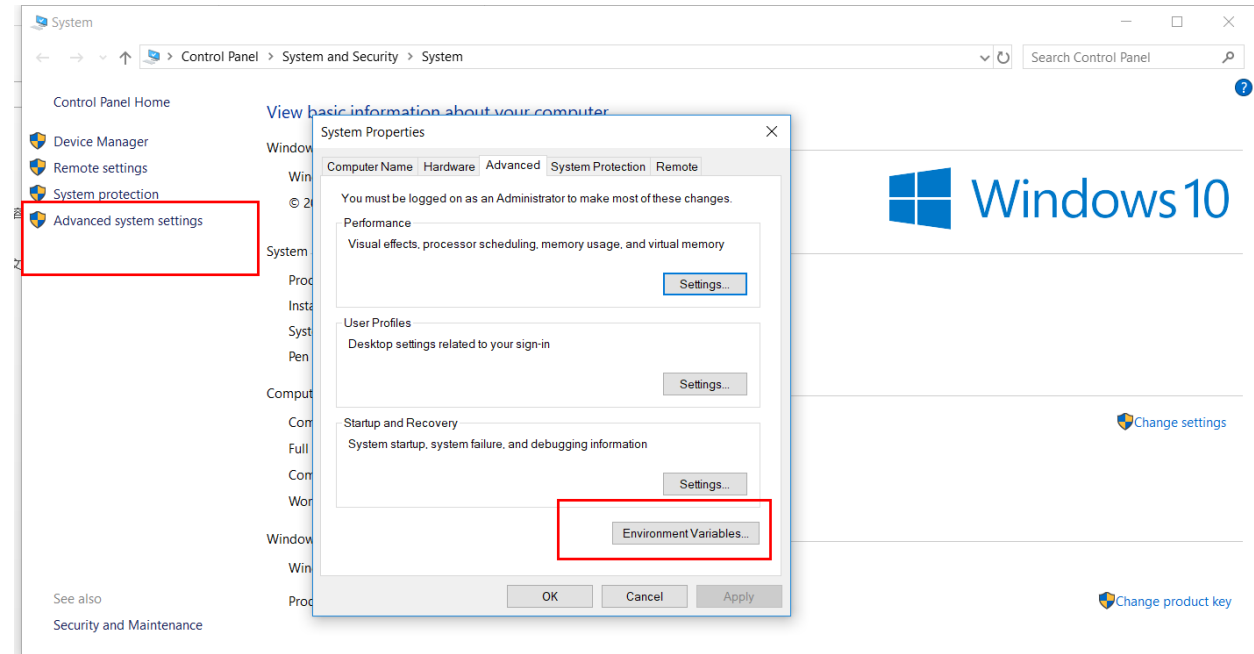
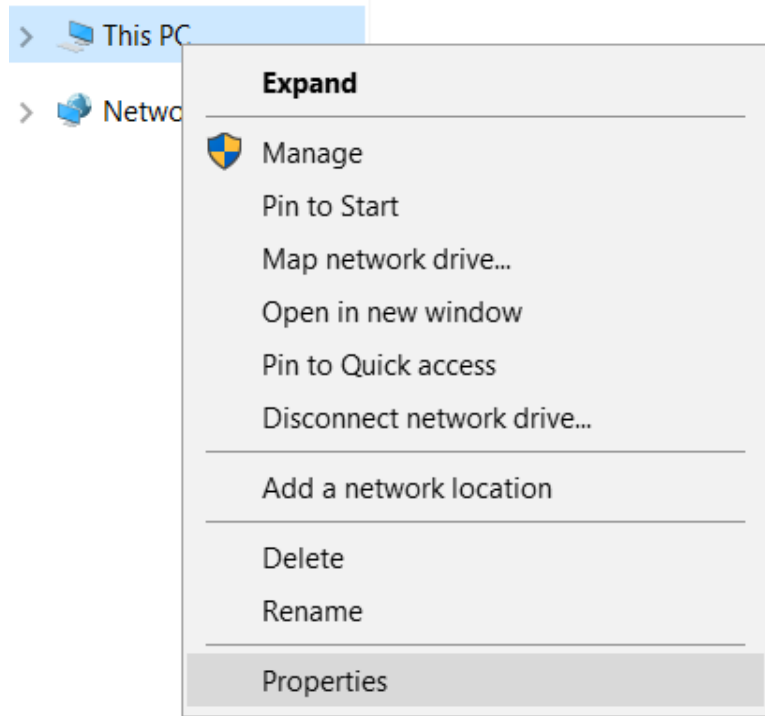
Name	Date modified	Type	Size
configured	1/3/2019 11:17 AM	File folder	
data	1/3/2019 1:44 PM	File folder	
doc	1/3/2019 1:44 PM	File folder	
downloads	1/3/2019 12:06 PM	File folder	
include	1/3/2019 1:44 PM	File folder	
install	1/3/2019 1:40 PM	File folder	
lib	1/3/2019 1:01 PM	File folder	
modules	1/3/2019 1:44 PM	File folder	
opencv2	1/3/2019 1:44 PM	File folder	
python_loader	1/3/2019 11:16 AM	File folder	
samples	1/3/2019 1:44 PM	File folder	
testdata	1/3/2019 12:07 PM	File folder	
test-reports	1/3/2019 11:17 AM	File folder	
tmp	1/3/2019 1:44 PM	File folder	
win-install	1/3/2019 1:44 PM	File folder	
x64	1/3/2019 12:31 PM	File folder	
ALL_BUILD.vcxproj	1/3/2019 1:44 PM	VC++ Project	68 KB
ALL_BUILD.vcxproj.filters	1/3/2019 12:17 PM	VC++ Project Filte...	1 KB
cmake_install.cmake	1/3/2019 12:17 PM	CMAKE File	9 KB
cmake_uninstall.cmake	1/3/2019 11:16 AM	CMAKE File	2 KB
CMakeCache.txt	1/3/2019 1:44 PM	Text Document	298 KB

Step5: Update environment variables

5.1 environment variable – PATH

step:

- Right click “This PC”, and click “properties”
- Click “Advanced system settings”, then click “Environment Variables”
- From System variables, edit PATH,

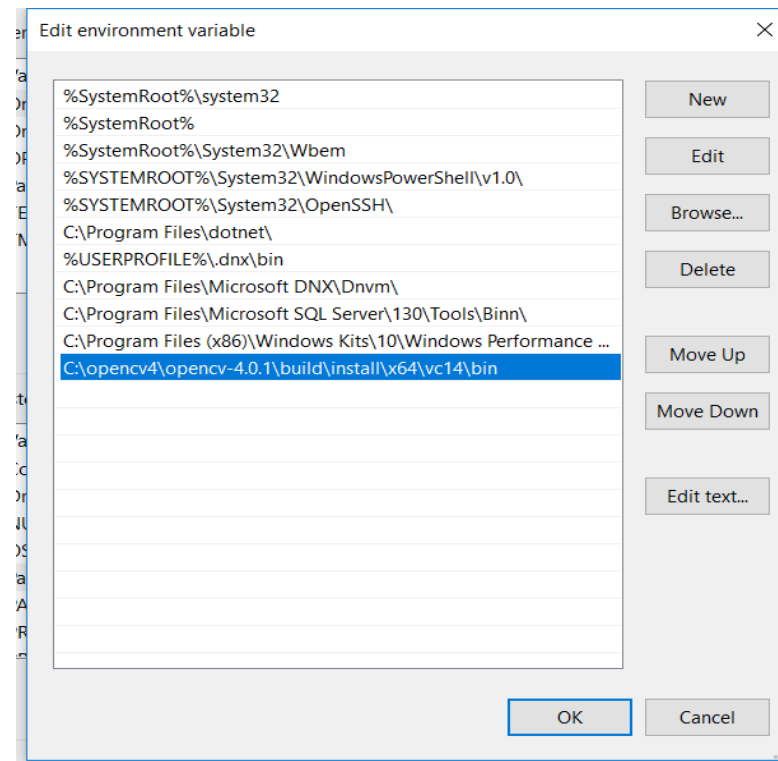
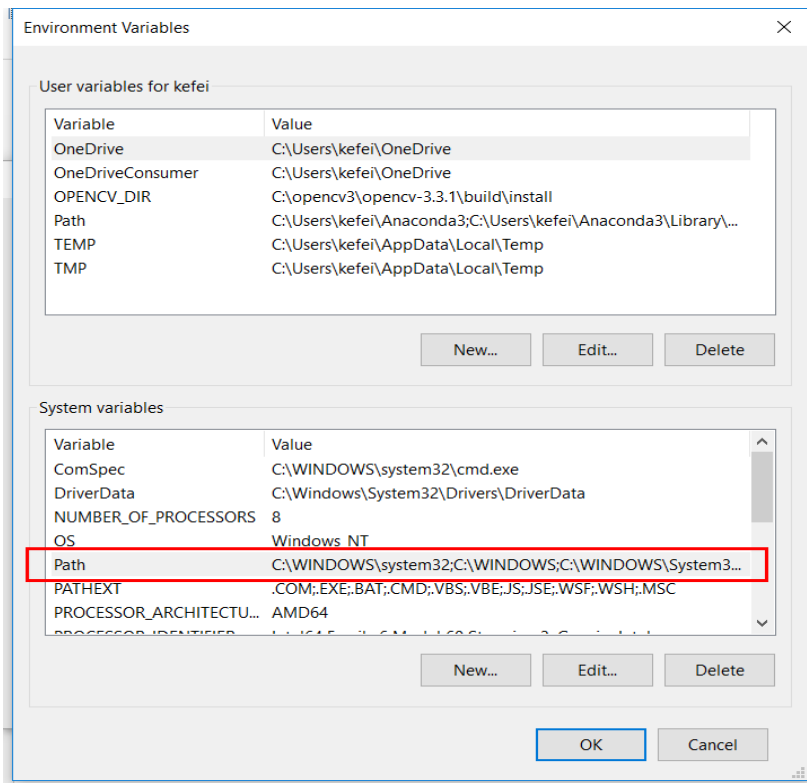


Step5: Update environment variables

5.1 environment variable – PATH

step:

- From System variables, edit PATH
- We refer the address "C:\opencv4\opencv-4.0.1\" as "{OPENCV_PATH}", (depends on where you extract your opencv resource file at the beginning). We add a new path "{OPENCV_PATH}\\build\\install\\x64\\vc14\\bin", for me it is "C:\opencv4\opencv-4.0.1\build\install\x64\vc14\bin"

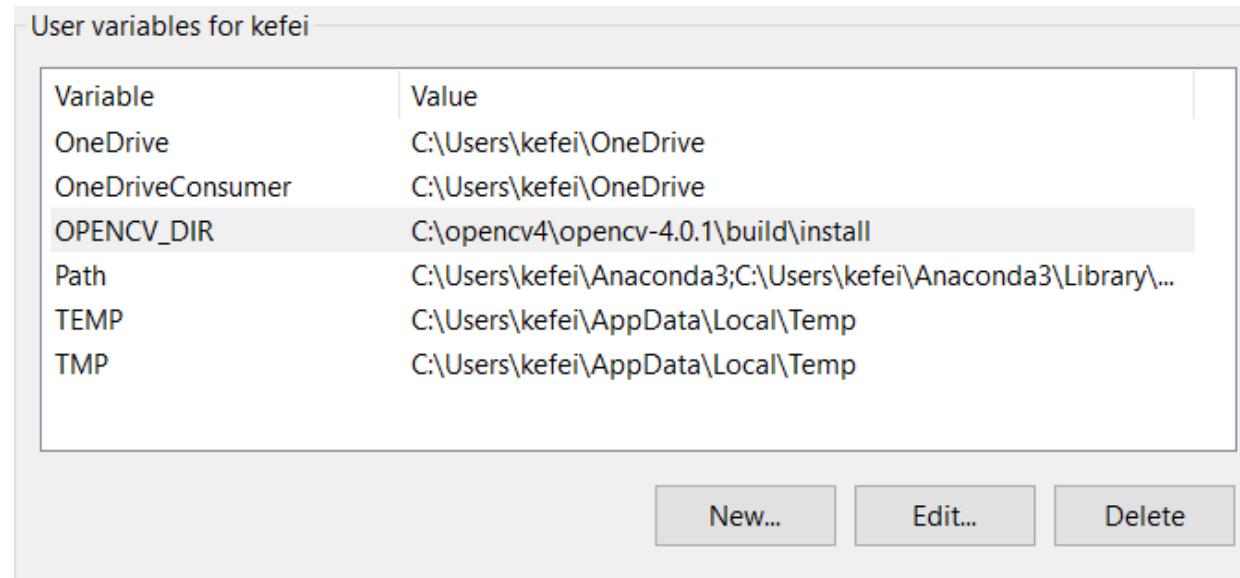


Step5: Update environment variables

5.2 user environment variable – OPENCV_DIR

step:

- Update Variable name: OPENCV_DIR
- Update Value: "{OPENCV_PATH}\build\install ", for this tutorial example it is "C:\opencv4\opencv-4.0.1\build\install"

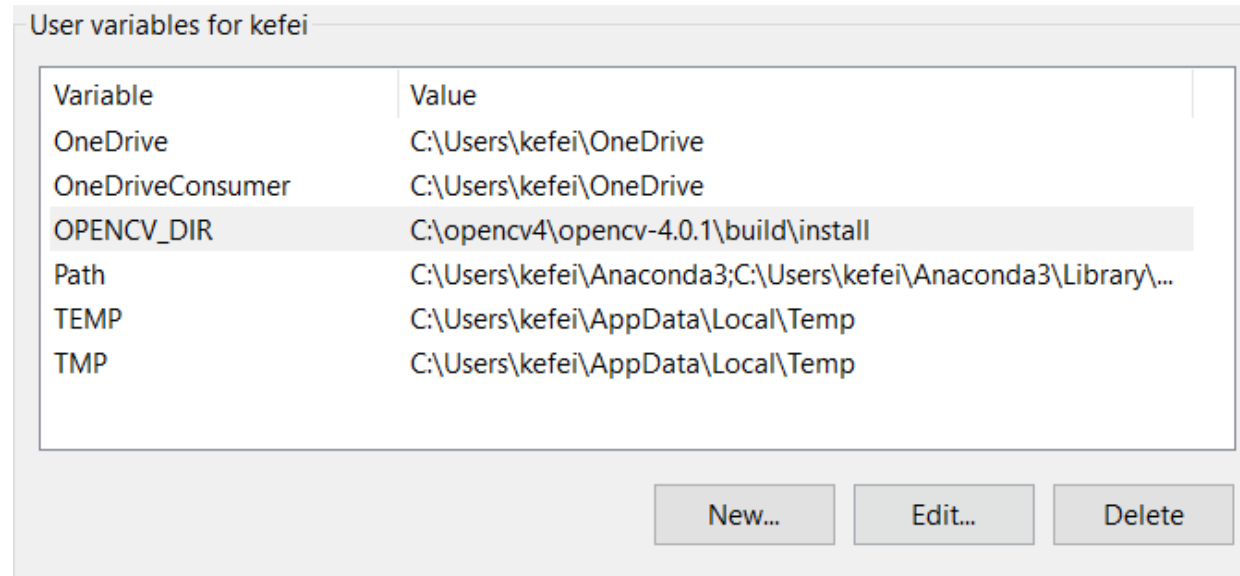


Step5: Update environment variables

5.2 user environment variable – OPENCV_DIR

step:

- Update Variable name: OPENCV_DIR
- Update Value: "{OPENCV_PATH}\build\install ", for this tutorial example it is "C:\opencv4\opencv-4.0.1\build\install"



note:

- Recommend to delete environment variable from other OpenCV versions
- Recommend to restart the system after updating environment variables

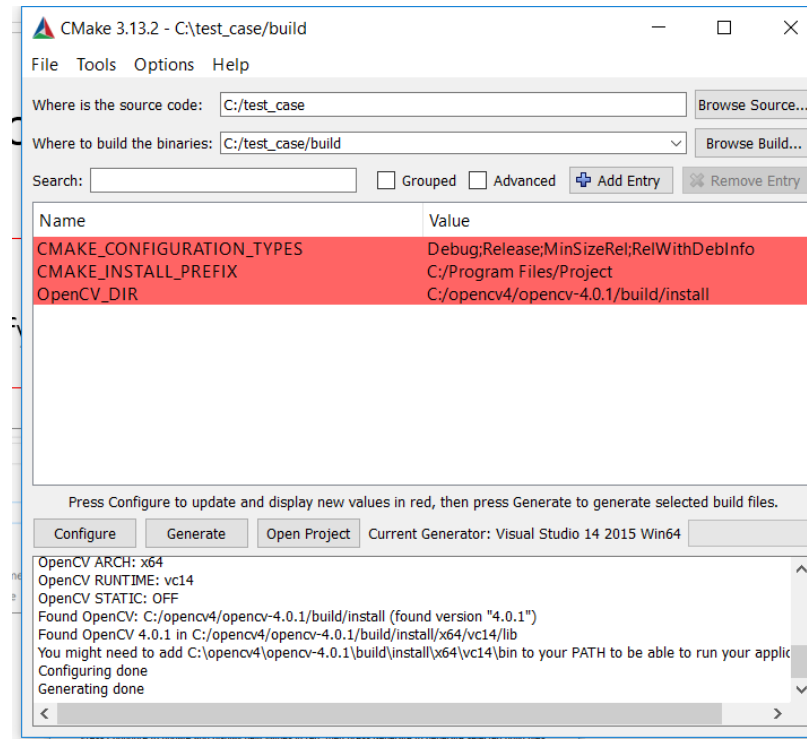
Step6: Test the compiled OpenCV (in C++)

6.1 CMake build

step:

- Put test files folder in the same disk as OpenCV
- CMake build: 1. specify source code and build directories, 2. configure, 3. generate project

This PC > Windows10_OS (C:) > test_case		
Name	Date modified	Type
church01.jpg	1/3/2019 2:41 AM	JPG File
church02.jpg	1/3/2019 2:41 AM	JPG File
church03.jpg	1/3/2019 2:41 AM	JPG File
CMakeLists.txt	1/3/2019 6:59 PM	Text Document
test_main.cpp	1/3/2019 7:07 PM	C++ Source



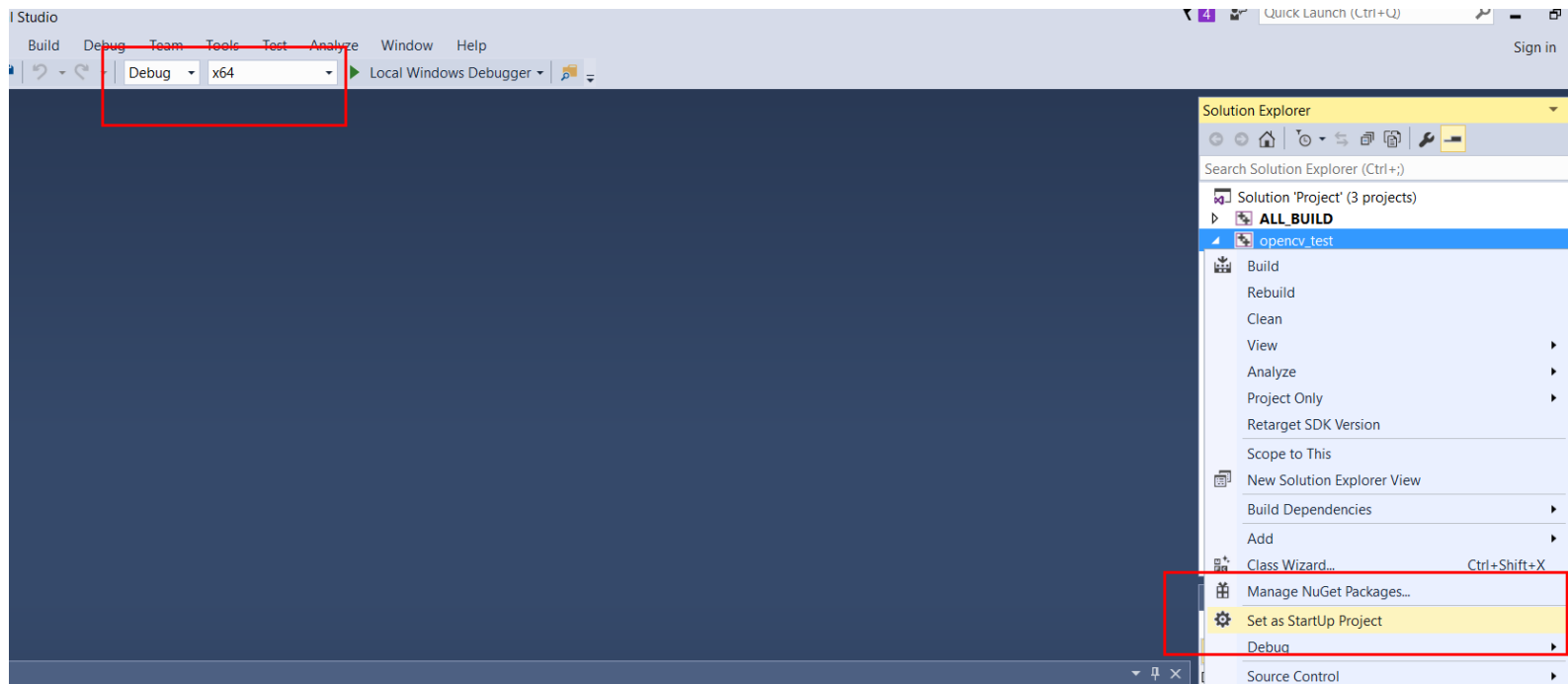
This PC > Windows10_OS (C:) > test_case > build		
Name	Date modified	Type
CMakeFiles	1/3/2019 11:12 PM	File folder
ALL_BUILD.vcxproj	1/3/2019 11:12 PM	VC++ Project
ALL_BUILD.vcxproj.filters	1/3/2019 11:12 PM	VC++ Project
cmake_install.cmake	1/3/2019 11:12 PM	CMAKE File
CMakeCache.txt	1/3/2019 11:12 PM	Text Document
opencv_test.vcxproj	1/3/2019 11:12 PM	VC++ Project
opencv_test.vcxproj.filters	1/3/2019 11:12 PM	VC++ Project
Project.sln	1/3/2019 11:12 PM	Microsoft Visual Studio Solution File
ZERO_CHECK.vcxproj	1/3/2019 11:12 PM	VC++ Project
ZERO_CHECK.vcxproj.filters	1/3/2019 11:12 PM	VC++ Project

Step6: Test the compiled OpenCV (in C++)

6.2 build and execute in Visual Studio

step:

- Open "Project.sln"
- Under "debug", "x64", right click "opencv_test", click "Set as StartUp Project". (it will turn bold)
- Press "F5" to debug



Step6: Test the compiled OpenCV (in C++)

6.2 build and execute in Visual Studio

Result: as shown

Note: this test file is an application of SURF for interest points detection, further development for object recognition, image registration, visual tracking, 3D reconstruction, etc. More information can refer to “cv::xfeatures2d::SurfFeatureDetector”

