

Getting Started with Open CV Library and Visual Studio

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ABSTRACT

This application note includes instructions for setting up Open CV library in Visual Studio 2010 and tutorial for beginning programming using Open CV library and C++.

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Keywords

Below is a list for the keywords that will be used in this application note.

Open CV, Visual Studio, VC++, Windows 8, Programming.

Introduction

About Open CV:

Open CV is an open source computer vision library. It has been widely adopted all over the world for its ability of processing real-time computer vision. It has multiple language interfaces and thus can be use in Windows, Linux, Mac OSX, Android and iOS.

Why this application note is helpful?

Since Open CV supports almost all mainstream operating systems, steps for setting up the development environment are different from platforms to platforms. The files included in the Open CV library can be different for each version of the library as well. Therefore, having a correct setup guide for Open CV is crucial to the success of software development. This application note will provide a step-by-step guide to help the reader setup the Open CV 2.4.3 development environment in Microsoft Visual Studio 2010 under 64-bit Windows 8.

Getting Started with Open CV in Visual Studio 2010

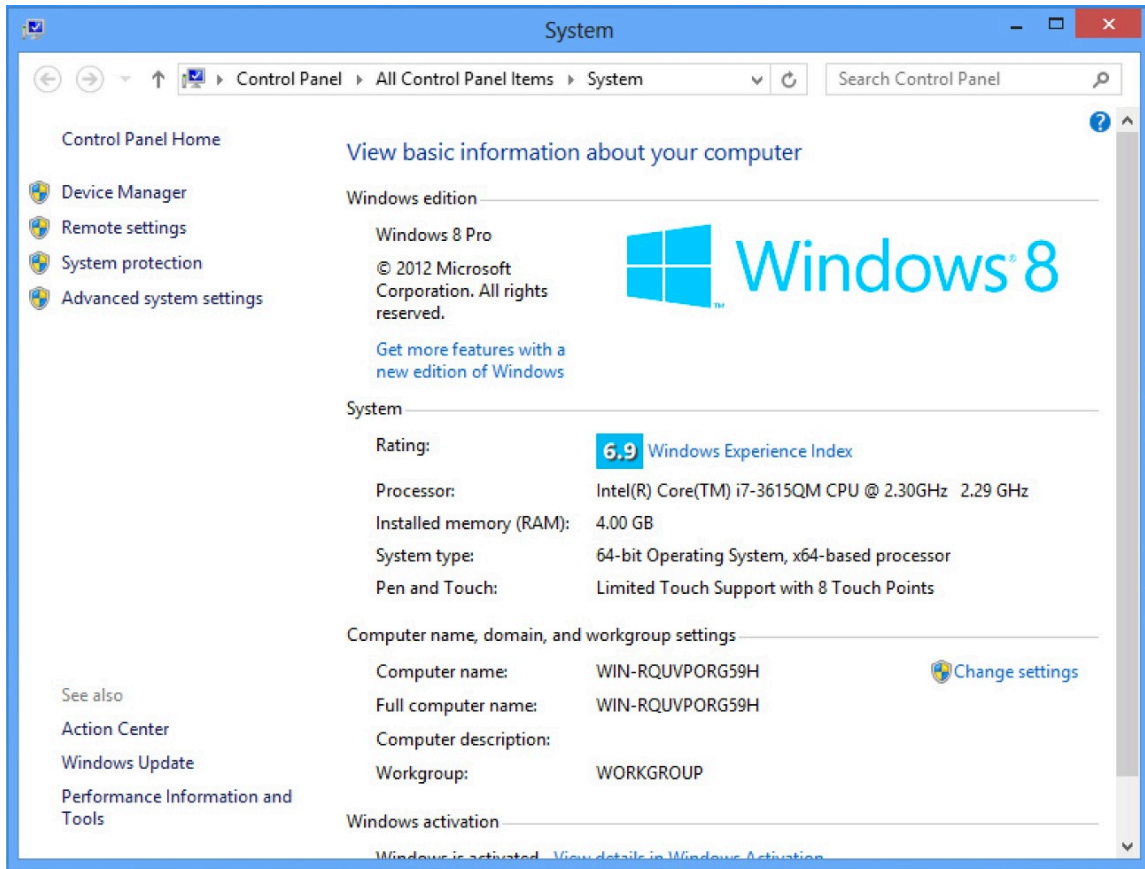
Setting up Open CV in Visual Studio 2010:

Open CV library can be downloaded at opencv.org. The Open CV library used in this tutorial is 2.4.3. The demonstration is done in Visual Studio 2010 Ultimate edition. Other editions of Visual Studio should be the same in terms of Open CV setup. The Windows used in this tutorial is Window 8 Pro 64-bit.

After finishing downloading the Open CV exe install file, double click the install file and choose C:\OpenCV243 as the destination directory for Open CV library. Other directories are also acceptable, but this tutorial will assume the user has installed Open CV library in C:\OpenCV243 directory.

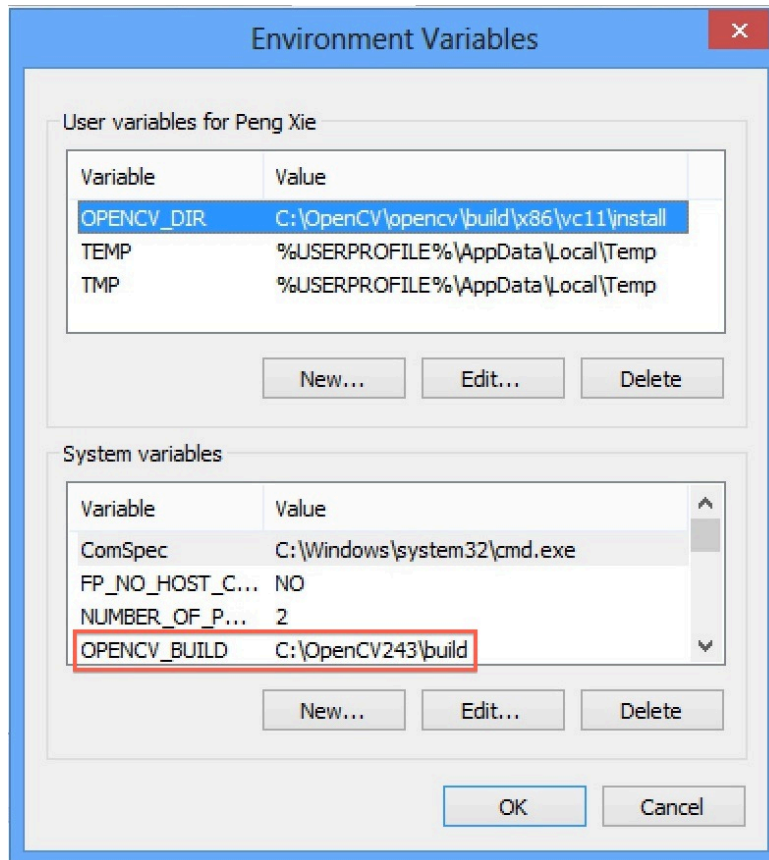
The install file will create a new folder containing all the Open CV library files in the OpenCV243 directory. Double click to open that folder and move everything in that folder into OpenCV243 directory. After all the files are moved into the OpenCV243 directory, delete the folder the installer has created. (That folder should be empty now since all the files are moved into OpenCV243 directory.) The Open CV library is now installed in the OpenCV243 directory.

Next step is to set system variables for Open CV library. Right-click on My Computer and choose property to open System window. The user can also access System window from Control Panel.



Window 8 System Window

In System window, click on Advanced system. This will bring up the System Properties window. In System Properties, choose “Advanced” tab and click on “Environment Variables...” button to open the Environment Variables setup window.



Environment Variables setup window

In System variables section of Environment Variables setup window, click “New...” button to add a new system variable named OPENCV_BUILD and set the value to the build directory for Open CV library. In the case of this tutorial, the value for OPENCV_BUILD is “C:\OpenCV243\build”. In addition, expand “%OPENCV_BUILD%\x64\vc10\bin” to the end of “Path” variable’s value.

After setting up the system variables, it’s time to create a Visual Studio project with Open CV. Open Visual Studio 2010, choose visual C++ templates and create a Win32 Console Application. Choose “Empty Project” preference to simplify the project. After the project is created, go to “Property Manager” tab located at the lower left corner of the Visual Studio window. Then right click on

Debug folder and choose “Add new project property sheet”. The name can be anything but it will be called `OPENCV_DEBUG` in this tutorial. Next step is to edit the properties. Expand the Debug folder and right click the project property sheet just created. Choose “Property” to open the setup window. In “General” page under “C/C++”, add “`$(OPENCV_BUILD)\include`” to Additional Include Directories. And in “General” page under “Linker”, add “`$(OPENCV_BUILD)\x64\vc10\lib`” to Additional Library Directories. Next, move to the “Input” page under “Linker”, add the following files to Debug Additional Dependencies:

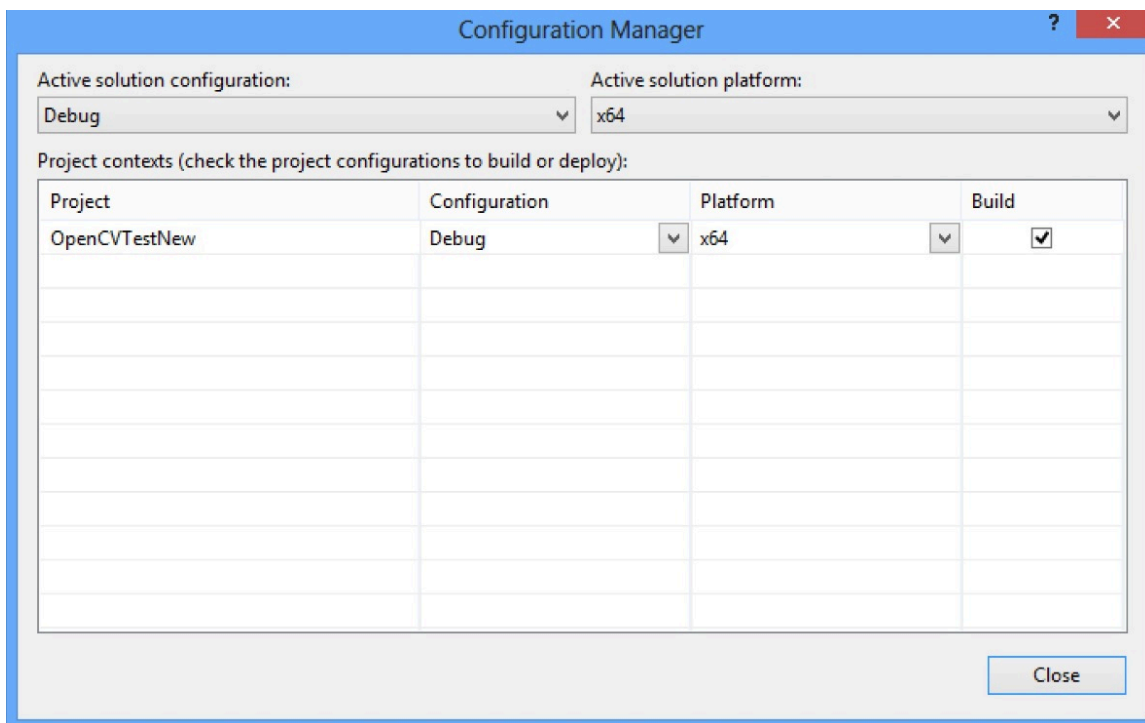
- `opencv_core243d.lib`
- `opencv_imgproc243d.lib`
- `opencv_highgui243d.lib`
- `opencv_ml243d.lib`
- `opencv_video243d.lib`
- `opencv_features2d243d.lib`
- `opencv_calib3d243d.lib`

The setting above is for debugging. For releasing, just create a new project property sheet under Release folder and following the same steps. The only different is to remove the “d” in file names for Debug Additional Dependencies.

Since this setup is for 64-bit Windows 8, the user also need to go back to “Solution Explorer” tab at lower left corner of the Visual Studio window and right

click on the project and choose “Property” to open the property window. Be careful on this step, right click on the solution instead of the project will open up a different window.

The project property window is similar to the property window in Debug. In this window, go to “Configuration Properties”, then “Linker”, and then choose “Advanced”. In the “Advanced” page, change Target Machine to “Machine X64” for a x64 build. The last step will require the user to go to the “Build” menu in top menu bar and open Configuration Manager. And make sure the platform of the project is set to x64 as it shows below.



Now, the Visual Studio has known all the files needed for Open CV library.

The setup is finished. Next part of the tutorial will provide a sample code to test the Open CV in Visual Studio.

Sample code to test Open CV library:

Below is the code using Open CV library to capture and display videos from the build in webcam of the computer.

```
#include<opencv\cv.h>
#include<opencv\highgui.h>

using namespace cv;

int main() {
    Mat image;

    VideoCapture cap;
    cap.open(0);

    namedWindow("window", CV_WINDOW_AUTOSIZE);

    while(1){
        cap >> image;
        imshow("window", image);
        waitKey(33);
    }
    return 0;
}
```

The code should compile and run without errors. Please keep in mind this simple code is for testing only and it is not prefect. Remember to choose x64 in the dropdown list of debug before start to run the project.

Conclusion

The tutorial in this application note should be efficient for readers to get started with programming using Open CV library version 2.4.3 in Visual Studio 2010.

Reference

Easy Installation Guide and Sample Project (VS 2010)

<http://www.youtube.com/watch?v=cgo0UitHfp8>