# Georgia State University
# CSC 8980 Computer Vision Spring 2017
# Dr. Ashwin Ashok

## Final Project ReadMe

## 360-180-degree vision implementation by single camera
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**Environment and necessary tools**
Windows 10 Pro (this is the system I am using, win 10 Home and Win 8 also can be used)
Command Prompt
OpenCV 2.4 Library
PV3D Library
Visual Studio 2013
Flash (Builder) cs6

**Input**
Any two images with duplicated part

**Output**
Stitched image

**Index**

**Set up OpenCV in Visual Studio 2013**

Create a new project

Name it ImageStitchingCPP (this is the name I use)

Visual C++ -> Win32 Console Application -> finish

Right click your project -> Properties and add following necessary dependencies

Active(Debug)

CP (Configuration Properties)/General

Output Directory:

..\bin

CP/C/C++/General

Additional Include Directories:

E:\My download\OpenCV\opencv\build\include;
E:\My download\OpenCV\opencv\build\include\opencv;
E:\My download\OpenCV\opencv\build\include\opencv2;

CP/Linker/General

Additional Library Directories:

E:\My download\OpenCV\opencv\build\x86\vc12\lib;

CP/Linker/Input

Additional Dependencies:

opencv_calib3d2410d.lib;opencv_contrib2410d.lib;opencv_core2410d.lib;opencv_features2d2410d.lib;opencv_flann2410d.lib;opencv_gpu2410d.lib;opencv_highgui2410d.lib;opencv_imgproc2410d.lib;opencv_legacy2410d.lib;opencv_ml2410d.lib;opencv_nonfree2410d.lib;opencv_objdetect2410d.lib;opencv_ocl2410d.lib;opencv_photo2410d.lib;opencv_stitching2410d.lib;opencv_superres2410d.lib;opencv_ts2410d.lib;opencv_video2410d.lib;opencv_videostab2410d.lib;ws2_32.lib;winmm.lib

**NOTE: be aware of your OpenCV directory location, might be different from mine**

**Import C++ program for image stitching**

Right click Source Files -> add new item -> C++ file

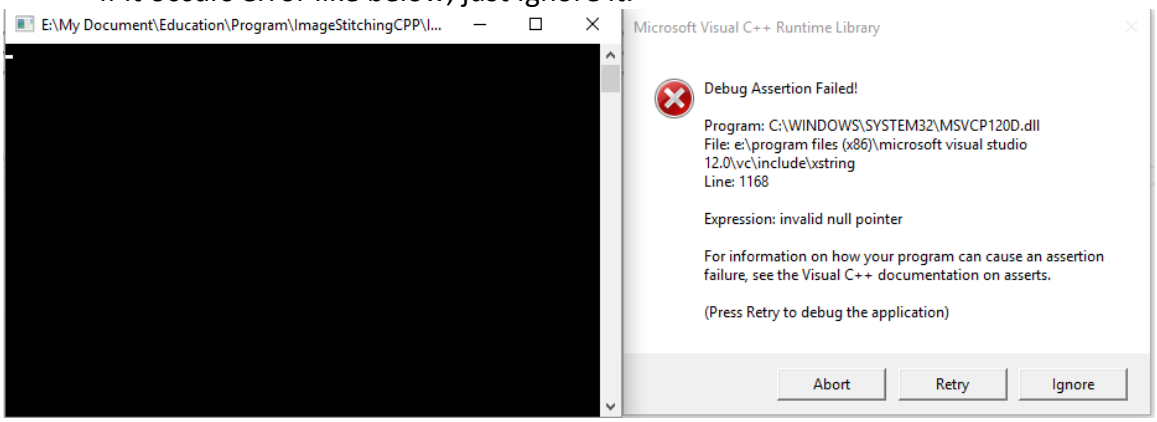
Name it Main.cpp (this is the name I use)

Copy and paste code from ImageStitching.txt into Main.cpp

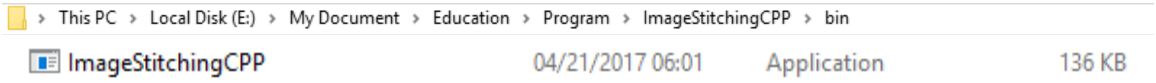
**NOTE: I highly suggest the way above, because if you import that directly may cause some errors.**

Run it and make sure there is no mistakes and errors.

If it occurs error like below, just Ignore it.




Then it will generate an EXE file in your bin folder, path shows below




**NOTE: the path and name depend on your project location and name**

Open Command Prompt

Shortcut: win+R -> cmd -> OK

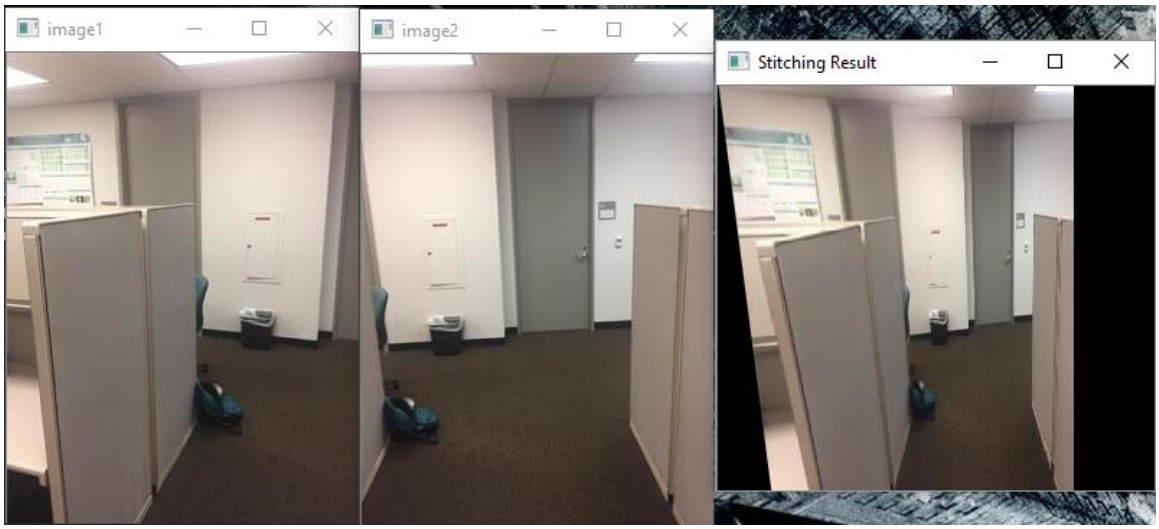
Go to the project/bin folder


Then input: ImageStitchingCPP.exe 1.jpg 2.jpg -> enter

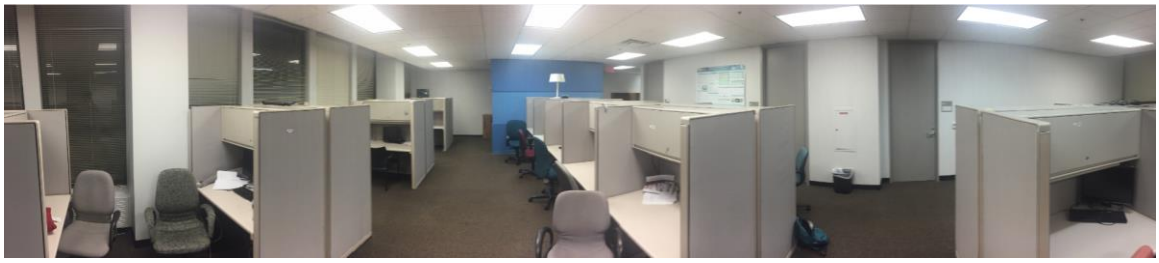
**NOTE: make sure the two images are in the project/bin folder**

**NOTE: processing time depends on input image size and PC, recommend to use two small images which can easily get the result otherwise CRASH EASILY!**

Result shows below




This program only support two images stitching and works perfectly. Multiple images stitching consumes more memory and time and like I mentioned before CRASH EASILY. Thus, we need to do many times to obtain the entire 360-180-degree vision. Something like below



**NOTE: I did many times to obtain this a little bit better panorama!**

**Build 3-dimension sphere and mapping**

This will use Flash cs6 (Adobe Flash Builder or Professional), it can be downloaded from Adobe and use it for 30-day trial

http://www.adobe.com/rs/products/flash.html

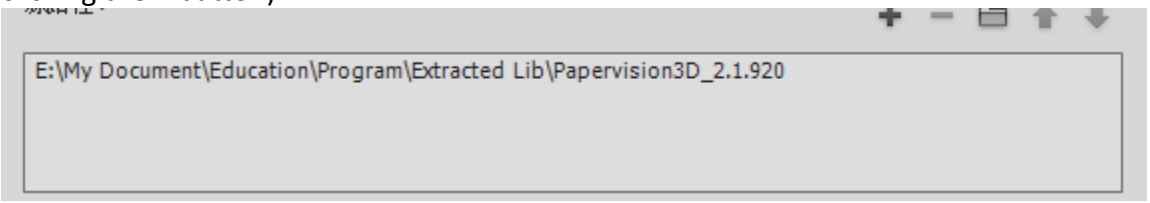
My version is cs6, I think other versions can also work

PV3D Library

This can be found from this package

Add PV3D Library into Flash

Edit -> Parameter (Ctrl+U) -> ActionScript -> ActionScript 3.0 -> add source (by clicking the + button)




**NOTE: path might be different from mine**

Create ActionScript 3.0 as file

File -> New -> ActionScript 3.0 class 

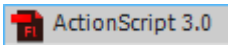

Name it SphereVision

Copy and paste code from SphereVision.txt into SphereVision.as

**NOTE: I highly suggest the way above, because if you import that directly may cause some errors.**

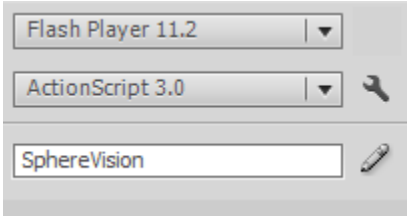
**NOTE: be aware of the path in SphereVision.as, might be different from mine**

Create ActionScript 3.0 fla file

File -> New -> ActionScript 3.0 fla 

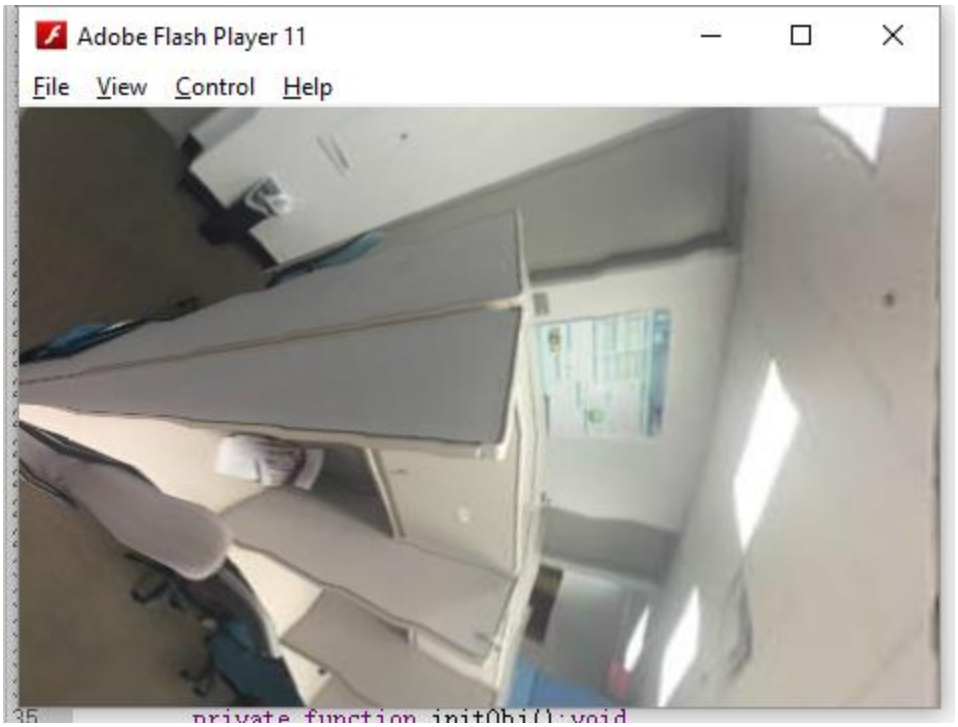

Name it SphereVisionShow

Add SphereVision in class in SphereVisionShow




In ShpereVisionShow and debug it

Debug -> Debug film -> Flash Professional




**NOTE: processing time depends on image size and PC**

Move the mice in the window can drag the view