EEE 598 : Digital Image and Video Processing : Project 1: Stereo Correspondence

Feature and Descriptors used:

1) FAST + FREAK
2) AGAST+ LUCID
3) SIFT

Applications:

1) Stereo correspondence to find epipolar lines and depth map.
2) Motion Estimation using optical flow.
3) 2D Image Stitching
4) Panorama Stitching
5) Localization and mapping
6) Object Recognition
7) Analysing the Human Brain in 3D Magnetic Resonance Images

Instruction to run the code:

1) OpenCV 3.3 xfeature2d libraries should be included.
2) Include the input images in a folder and change the path in imread() .
3) Run the program in Debug mode on x64 platform.
4) First clean the solution by clicking Build → Clean Solution.
5) Then build the project by clicking Build → Build Solution.
6) After this, click on Local Window Debugger to run the code.
7) For running the code with crosscheck flag in BFMatcher, please include the 'true' parameter in the function BFMatcher.
8) To include the threshold pruning of matched key-points, uncomment the section :
   --- For Thresholding --- and run the code similarly.

Folder details:

1) Code: This folder contains the PDF of the code written to perform the stereo correspondence and the source code of the entire project

2) Input: This folder contains the input image and ground truth disparity map used for the project. We have chosen Flower Pot image from 2006 dataset in http://vision.middlebury.edu/stereo/data/

3) Output: In this folder the images indicating key-points, best matched points is stored for four combination of number of key-points (With/Without cross check during BF Matcher, With/Without threshold enforced on the distance between the descriptors as explained in the report). This folder contains another sub folder Err_Output which has the screenshots of the error obtained for each method.

4) Grading Sheet.

System Requirement: Windows 10, Visual Studio 2015.

Reference:

For code:

https://docs.opencv.org/3.3.0/d4/d86/classcv_1_1xfeatures2d_1_1LUCID.html
https://docs.opencv.org/3.3.0/d0/d13/classcv_1_1Feature2D.html
https://docs.opencv.org/3.3.0/d9/d97/tutorial_table_of_content_features2d.html
https://docs.opencv.org/3.3.0/d4/d5d/group__features2d__draw.html

For Applications:
https://pdfs.semanticscholar.org/d950/c9c89d53c5c2c14dff45cae052daf65064b7.pdf