Assignment Project #3 "Fundamental Matrix"

Due date: Monday, 04/15/2014, 5:00pm

Description:

1. Load both images provided at
   (http://www.cs.stevens.edu/~ghua/ghweb/Image.zip),
   convert them to grayscale image
2. Detecting feature point using your own corner detection code in Project #2.
3. Extract fixed size image patches (e.g., 5 by 5) around every feature point, form a descriptor simply by vectorizing the image pixel value in raster scan order.
4. Computing the normalized correlation between every descriptor in one image and every descriptor in the other image.
5. Select the top few hundred descriptor pairs with the largest normalized correlation values. Note each point in one image can only be paired with one point in another image.
6. Run RANSAC to estimate the fundamental matrix of these two images using the normalized eight point algorithm. Your RANSAC could be the simplest.
7. BONUS (5points): Run RANSAC to obtain an affine transformation using the correspondences you built from your feature matching. Stitch the image together by warping one image to another image using the affine transformation you obtained. Create a paranoramic image by appropriately blending the color pixel values in the overlapping zones of the warped image and the other image.

What to turn in?

You should write a report to present each of the intermediate results you obtained, such as the how many corner points you detected and how many pairs you picked up using normalized correlation.

Please make your Matlab code in a single .m file with appropriate comments from each line of the code.

Put your report, your Matlab code, and the source images to you used for generating the results in your report into a single zip file. Submit it through Moodle before the due time.

Please name your folder as well as the zip file as

[yourfirstname]_[yourlastname]_Project3.zip

If your code cannot run, you may also turn in it with more detailed comments on what you did and tested in your code.

Bonus Points:

You get 5 bonus points if created a good panoramic image.

Grade: 10%

You will be penalized if your code cannot run. You will also be penalized if you did not create the hybrid image in the right way.

Late submission policy applies universally with no exception.

If you have a compelling excuse, you must inform me at least 2 days before the due date. I don't accept excuses such as "I am overloaded by other courses".