Computer Vision SBE 404

Project 3: Feature point detection, features descriptors (SIFT) and image matching (SSD and normalized cross correlation)

Due time: April 14,2016 @ 11:59 pm

For given set of images (grayscale and color)

A) Tasks to implement

1) Extract the unique features in all images using Harris operator or λ-. Report computation times to generate these points.
2) Generate feature descriptors using scale invariant features (SIFT) for the detected features in point 1. Report computation time.
3) Match the image set features using sum of squared differences (SSD) and normalized cross correlations. Report matching computation time.

B) Report all of the above to TA's (One Zip file including report, codes, results, etc).

Notes:

1. To make your submission:
   1.1. create zip folder that contains:
      1.1.1. Three or four m.Files for you code. (see note 3 for details)
      1.1.2. Pdf Report (see note 2).
      1.1.3. Any images or necessary attachments to make your m.file work.
   1.2. Rename your compressed Folder by your group name and the task number like : ***Group#1Task#3***
   1.3. Upload your zip folder on : submission Link

2. The report should contain :
   2.1. Details about "how to use your code" to produce the snapshots that you would provide
   2.2. A snapshots shows how your code works

3. **In this task you should create 3 independent functions**
   3.1. The first function is for detecting features that should be in the form :
   [featuresPoint_index]= detectFeatures('imageName')
   3.2. The second functions takes the image and the index of the features points , and return the feature locations with the it's description in the form of :
   [featuresSift_descriptor] = generateFeatureDescriptor ('imageName' , featuresPoint_index)
   3.3. The third function is to match two images features together, that takes 10 features from two images and match them together.
   this functions should contain a smaller function that apply the SSD or the correlation with two single features descriptor
4. Organization and producing a modular code is much appreciated (Bonus)

In cases of copying: both reports will be deducted in marks. In case of exact project and/or report: Both will be cancelled