ECE415 – HOMEWORK 5
Fall 2018

Problem 1

Detect features in the image 'checkerboard.jpg' using the Harris detector.
1) Display the image
2) Detect the features using Harris detector. Assume that the patches are of size 5x5 pixels.
   a) Display the x-derivative, y-derivative.
   b) Use Forstner-Harris metric to measure usefulness of the features.
   c) Select features based on the value of local maximums. What threshold did you use? Display image with marked locations of the selected features.
3) Use adaptive non-maximal suppression to select features.
   a) Select same number of features as you had in part 3.
   b) Display image with marked locations of the selected features.
   c) Comment on the location of features in part 2 and part 3.
4) Rotate the original image by 45 degrees using built-in Matlab function imrotate(). Display the rotated image.
5) Repeat steps 2 and 3 for the rotated image.
6) Match the features found using adaptive non-maximal suppression in the original image to the ones found in the same way in the rotated image. For comparison use sum of squared differences between patches. Keep in mind that before matching two features you have to rotate both of them to align their orientation. How many features were matched? Display the original image with marked locations of the matched features.
7) Repeat the above for the image 'Image.bmp'

Note: Do not use any built in Matlab functions except for imrotate and to read in and display the image.
Note: All plots must have a meaningful title.