**CS5404 Fall 2016 Homework 4 (10pts)**

**Due Nov 7 2016, 11:59PM, submitted via Canvas.**

This project is to estimate homography matrix given matched points between two images

(0) Two images are provided for this homework, but you can use your images in homework 2 and 3, or you can use your own camera to take two new images. We will use the given two images to test if your code is correct or not.

(1) Use Matlab function ginput() to select N points in image 1 and their corresponding points in image 2;

(2) Assume , use the Pseudo inverse method in Lecture 12 to estimate the homography matrix;

(3) Assume , use the eigen-decomposition and singular value decomposition (details in Lecture 12) to estimate the homography matrix. Compare the results with (2).

Something to think and try:

1. If you select N <= 4 points, what will happen? If you select N>>4 points, will the result be better than that with N=4 points?
2. If you select N>=4 points along a line, what will happen? If you select N>=4 points spreading over a wide region, will the performance be better than that with points concentrating within a small region?

Upload running code and a briefly written report to Canvas by the due date/time.

**Bonus 1 (up to 10%)**: if you are the submission (), you earn (11-n)% bonus points for this homework.

**Bonus 2 (up to 10%)**: if you try the preconditioning step on the two sets of points (Lecture 12), you can earn up to 10% bonus points. Compare the performance with/without the normalization step.