Name: _____

Score: /9

CSE 5524 Computer Vision for HCI AU'19

Homework Assignment #10 (LAST ONE!)

Due: Wednesday 11/13 (Mondy is holiday)

Stereo/Disparity:

1) Compute a **disparity** map for the images left.png and right.png (having parallel optical axes) using the **basic** stereo matching algorithm. Use your **NCC** function to perform the template matching for each patch in the left image searching in the right image (search only leftward from the starting point along each row!), and use a window size of 11x11 pixels. To make things run a bit faster for Sayan, when searching leftward, only move up to 50 pixels to the left (instead of to the edge of the image). Use the following Matlab code to display the disparity map D with a gray colormap and clip the disparity values at 50 pixels. [5 pts]

```
figure;
imagesc(D, [0 50]); axis equal;
colormap gray;
```

Classification:

2) Write an implementation of the simple k-Nearest Neighbors (kNN) algorithm to classify data points.

   Use the points in file *train.txt* as training data (this file contains 1 row for each data point where the first two columns are x,y coordinates and the third column is the ground truth classification label). Classify all the test data points in the file *test.txt* (formatted in the same way) using K=1. Calculate and report the accuracy of your algorithm (compared to the third column ground truth of the test data). Plot the test data points, color coded by the class label your algorithm gives (use `plot()` options `'r.'` and `'b.'`). On the same figure (use `hold` on/off), (re)plot the points which are misclassified (use `plot()` option `'ko'` or something similar to easily identify these points). Repeat this for K=5, 11, and 15. Compare the results for different values of K. [4 pts]

   (Note: You may use the Matlab function `knnsearch()` for part of this problem.)

3) As usual, turn in and upload your material.