Name: _____

Score: /18

CSE 5524   Computer Vision for HCI   AU'18

Homework Assignment #3
Due: Tuesday 9/11

_____

1) Generate a 4-level Gaussian pyramid (original image is level-1) <u>and</u> the corresponding Laplacian pyramid of an image (select one from the web). Use the formula in the notes to first determine a viable image size, and crop the image (if needed) to test the pyramid code. Use a=0.4 for the Gaussian mask – use separable masks! Write/use functions for properly reducing and expanding an image. Write your own interpolation function - do <u>not</u> use Matlab in-built interpolation functions (e.g., interp2). [7 pts]

2) Using the grayscale images (walk.bmp, bg000.bmp) provided on the WWW site, perform background subtraction 1 to identify the object. Make sure your image is of type *double*! Experiment with thresholds and discuss. [2 pts]

3) Using the grayscale images (walk.bmp, bg[000-029].bmp) provided on the WWW site, perform background subtraction 2 using statistical distances. Experiment with thresholds and discuss. [5 pts]

4) Dilate the best binary image resulting from problem 3) using: [1 pt]

```
d_bsIm = bwmorph(bsIm, 'dilate');
```

5) Next perform a connected components algorithm, and keep only the largest region in L (save/display as an image). [1 pt]

```
[L, num] = bwlabel(d_bsIm, 8);
```

Turn in all code, printouts of images, and discussion of results. Make a "**name-osunumber_HWx.fileformat**" script to do all tasks and call needed functions. Upload your code and selected images to Carmen. [2 pts]

MATLAB help: Loading several ordered grayscale images:

```
for i=1:N
        filename = sprintf('myimage_%03d.bmp', i-1); % if starts with 000
        Im(:,:,i) = double(imread(filename));
end
```

The %03d gives a zero-padded number (e.g., 001), and the image storage is now a 3-D cube. To get image 3 from the cube, use myIm = Im(:,:,3). With such a cube, MATLAB operations such as 'mean' can be told to work along certain dimensions of the cube.