**Project #2 - Spatial Enhancement Methods**

**Due date: 2015/11/08**

**Requirements**

(a) Write a computer program capable of drawing histogram of input image and enhancing the image through histogram equalization. Input to your program is one image (e.g. Fig. 3.16 left column). Outputs should include the corresponding histogram equalized image (e.g., Fig. 3.20 center column), and histograms of both input image (e.g., Fig. 3.16 right column) and output image (e.g., Fig. 3.20 right column).

(b) Write a computer program capable of combining spatial enhancement methods for image processing. Input to your program is one image, e.g., Fig. 3.43(a). Outputs should include one combined result and six intermediate images, e.g., Fig. 3.43(b)-(h)).

(c) Use your creativity to enhance Fig. 3.43(a) and get one satisfactory result. Compare it with Fig. 3.43 (h) and explain why.

(d) Use your creativity to enhance testing image, i.e., p2test.tif, provided by us. Get a satisfactory result and explain the techniques you have used.

(e) Upload your project results to E3 before the due time with one single zipped file named “IP\_Project2\_[StudentID].rar”. The file should include: (1) source code with proper comments and (2) project report.

Some sample images are provided for you to verify each of your functions, e.g., drawing histogram (Fig. 3.16), histogram equalization (Fig. 3.16), power law transformation (Fig. 3.8), smoothing filtering (Fig. 3.33(a)), the Laplacian (Fig. 3.38(a)), unsharp masking (Fig. 3.40(a)), and the gradient (Fig. 3.42(a)). It is suggested that project reports be kept short, and be organized in a uniform manner to simplify grading:

Part 1: Information of the project should be typed neatly in the top of page 1.  
Information including: project title, project number, course name, student's id, student's name, date due, date handed in.

Part 2: Technical discussion.  
This section should include the techniques used and the principal equations (if any) implemented. Some best practices or implementation issues are encouraged to present here.

Part 3: Experimental results discussion.  
A discussion of results should include major findings in terms of the project objectives, and make clear reference to any images generated.  
Appendix (optional). Some special designs of your partial program could be listed here. Standard routines and other material obtained from other sources should be acknowledged by name, but their listings should not be included. Do not list all your source code here.