EE435 Spring 2010 PS02 (Problem Set 02)

Assigned: Monday 1/25/10 Due: Monday 2/1/10

1. What is the difference between the terms "intensity transform" and "spatial filtering"?

   intensity - operates on individual pixels....
   spatial filtering - output values computed based on a neighborhood of pixels.

2. What is the difference between how convolution in image processing, and how correlation is performed?

   Correlation - no flipping of one image left/right and up/dow

3. What is a Laplacian filter used for in image processing?

   Typically, edge detection.

4. When is it better to use a median filter to reduce noise rather than a low pass filter?

   salt & pepper noise

5. Explain why sometimes it is useful to use a logarithmic function in order to view an image.

   A computer displays shades of gray 0-255. If the range of values of an image are much much larger than this range, a log can compress the range of values for viewing 0-255.

6. What is the effect/purpose of using the *fftshift* function when performing an operation on an image in the frequency domain?

   shifts 0 spatial frequency to the center of the FFT.

7. When performing frequency filtering operations in the frequency domain, what is the purpose of taking the real part of the inverse Fourier transform?

   Filtering combined w/quantizing can result in an image tha has a small imaginary part - take the real part to discard the imaginary part

8. What is the primary of using a Gaussian frequency filter over an ideal frequency filter?

   no "ringing" around edges w/Gaussian filter.