EE225B   Homework 3   Due Thursday March 13th

Use third edition of G&W to refer to these problems.

Problem 4.28 from G&W ➔ hand in hard copy

Problem 4.31 from G&W ➔ hand in hard copy

PROJECT 04-02 ➔ email your code and your solution to TA & hand in hard copy

Fourier Spectrum and Average Value

(a) Download Fig. 4.41(a) from the book web site and compute its (centered) Fourier spectrum.

(b) Display the spectrum.

(c) Use your result in (a) to compute the average value of the image.

PROJECT 04-03 ➔ email your code and your solution to TA & hand in hard copy

Lowpass Filtering

(a) Implement the Gaussian lowpass filter in Eq. (4.8-7). You must be able to specify the size, M x N, of the resulting 2D function. In addition, you must be able to specify the location of the center of the Gaussian function.

(b) Download Fig. 4.41(a) from the book web site and lowpass filter it to duplicate the results in Fig. 4.48.

PROJECT 04-04 ➔ email your code and your solution to TA & hand in hard copy

Highpass Filtering

(a) Implement the Gaussian highpass filter of Eq. (4.9-4). (Note that, if you did project 04-03, you can use basically the same program to generate highpass filters.)

(b) Download Fig. 4.41(a) from the book web site and highpass filter it to duplicate the results in Fig. 4.56.

PROJECT 04-05

Highpass Filtering Combined with Thresholding

Download Fig. 4.57(a) from the book web site and use your program from Project 04-04 to approximate the results in Fig. 4.57 (note that you will be using a Gaussian, instead of a Butterworth, filter.