

Project #2 Spatial Filtering

Due Tuesday September 21st.

Spatial Filtering

Write program to perform spatial filtering of an image (see GW Section 3.5 regarding implementation). You can fix the size of the spatial mask at 3 x 3, but the coefficients need to be variables that can be input into your program. This project is generic, in the sense that it will be used in other projects.

Enhancement Using the Laplacian

- (a) Use the above program to implement the Laplacian enhancement technique described in connection with Eq. (3.7-5). Use the mask shown in Fig. 3.39(d).
- (b) Duplicate the results in Fig. 3.40. You will need to download Fig. 3.40(a).

Unsharp Masking

- (a) Use the above program to implement high-boost filtering, as given in Eq. (3.7-8). The averaging part of the process should be done using the mask in Fig. 3.34(a).
- (b) Download Fig. 3.43(a) and enhance it using the program you developed in (a). Your objective is to choose constant A so that your result visually approximates Fig. 3.43(d).

Edge Detection

Process the Lena image using the following operators:

- (a) X and Y directed Sobel
- (b) $|G_x| + |G_y|$
- (c) magnitude Gradient

Discuss how well each operator was able to detect the edges in the image.