Programming Assignment Questions

15CSE363 Principles of Digital Image Processing

Image Databases: http://www.imageprocessingplace.com/root_files_V3/image_databases.htm
https://www.cse.unr.edu/~bebis/CS474/images.html

Image Reading & Displaying

Read one color image and convert into gray level and display the same.

Image Enhancement

Read one color image and change its brightness and contrast.

Image Sampling

Write a program to change the spatial resolution from 256 x 256 to 128 x 128, 64 x 64, and 32 x 32 pixels using sub-sampling by a factor of 2, 4, and 8 correspondingly. For comparison purposes, resize the sub-sampled images back to the original size 256 x 256. Show your results using the "lenna" and "peppers" images from the image gallery. The example below shows how to sub-sample and resize an image assuming a factor of 2. Use the same idea for factors 4 and 8.

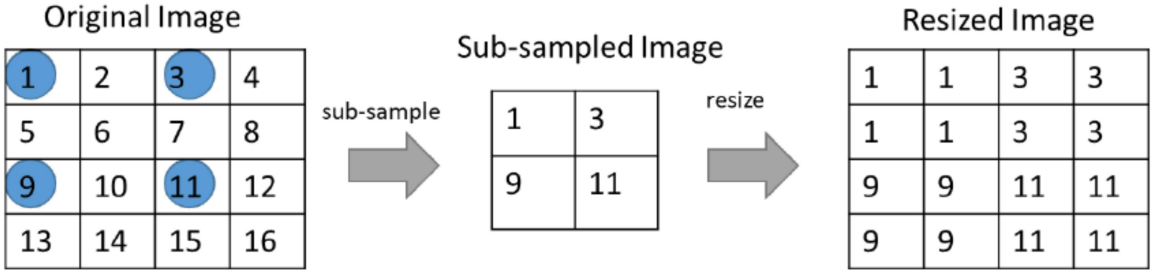

Image Quantization

Write a program to reduce the number of gray levels L in an image from L=256 to: (i) L=128, (ii) L=32, (iii) L=8, and (iv) L=2. Show your results using the "lenna" and "peppers" images. For visualization purposes, you can still use the gray level values in [0, 255].

Histogram Equalization

(a) Perform histogram equalization on the “boat” and “f_16” images.

(b) Show all images and their histograms before and after equalization and analyze your results.

Image Smoothing

Smooth the images using the following filters

(a) Guassian (apply different sigma values)

(b) Median filter

(c) Average filter

Image Sharpening

(a) Perform image sharpening by developing different types of Laplacian masks.

(b) Implement unsharp masking and high-boost filtering.