Image_processing_basic_operations

1. Digital Image Fundamentals

A. Read an Image, Display on Figure window with a title
B. Observe the pixel values of the Image
C. Replace a selected portion of the image by a constant and observe
D. Use Image differencing to observe the change
E. Display multiple images in same figure (use subplot)
F. Demonstrate the effect of varying spatial and gray level resolution
G. Resize an Image using different interpolation techniques and observe
H. Rotate an image and show
I. Find the distance (Euclidean, D_4 and D_8)between two points

2. Image Transforms

A. Find the FFT of an image and display.
B. Demonstrate phase dominance.
C. Apply various filters in frequency domain and demonstrate
D. Apply Discrete Cosine Transform on images.
E. Apply KL Transform on images.
F. Demonstrate the use of Band pass and band reject filters.

3. Image enhancement and Color Image Processing

A. Apply the following transformations
B. Negative (ii) Log (iii) Power law (iv) Contrast stretching (v) Bit-plane slicing

C. Plot histogram of an Image
D. Convert the image to binary choosing a suitable threshold from Histogram
E. Perform histogram equalization and matching

F. Generate a noisy image and display
G. Apply various Low pass filters on the image in spatial and frequency domain.
H. Apply various High pass filters on the image in spatial and frequency domain.
I. Demonstrate the use of median filter.
J. Generate a set of noisy Images and use averaging to reduce noise
K. Apply various HPF on an image.
L. Perform edge crispening.

UNIT 4: Image restoration and reconstruction

A. Apply average filter and Weighted average filter on an image and compare the results.
B. Perform Min and Max filtering.
C. Compare the results of Adaptive median filter with median filter.
D. Perform adaptive local noise filtering.
E. Apply Mid point filter and alpha trimmed filter on images and demonstrate.
F. Apply Contraharmonic mean filter, Geometric mean filter on images.
G. Perform Unsharp masking.
H. Perform High boost frequency filtering.
I. Perform filtering using Sobel, Prewitt, Roberts operator and compare the results.