

## **Digital Image Processing Assignment 2**

1. Download Lena image and 2D-DFT of the image and call it as F1. For the same Lena image use 1D-DFT along each row and column ( as discussed in the class ) and call the resultant image as F2. Display the IFT(F1) and IFT(F2) and verify whether both are same or not.
2. Download Lena image and a Dog image. Find the Fourier transform of the Lena image, say R1. R1 is a real component of the Lena image and I1 is the imaginary component of the Fourier transform of the Lena image. Find the Fourier transform of Dog, call R2 as real and I2 as imaginary. Find IFT (  $R1 * e^{i2}$  ) and display. Similarly, IFT (  $R2 * e^{i1}$  ) and display. Observe the relationship between the original Dog and Lena image with respect to the displayed images.
3. Synthesize a matrix with size 200 x 200 with 100's in the middle half of the image and 0's elsewhere. Call this matrix as image F. Find the following projections:

1. Row
2. Column
3. Diagonal,  $45^\circ$
4. Diagonal,  $135^\circ$

Reconstruct using Back Projection in all the above directions and observe the resultant reconstructed image.

5. Download a color Lena image and find the R, G, B components of the image and do the histogram equalization in each of the plane (R, G, B) and display the processed RGB color image.
6. Write 10 characters of your choice on white paper with a black pen and leave some broken strokes while writing, Take the image of it using a mobile camera and do the following operations. Give your observation:
  1. Erosion
  2. Dilation
  3. Opening
  4. Closing
  5. Thickening
  6. Thinning