

Image Processing
Computer Assignment
B.Tech Sem VII
15/10/2018
Time Limit: 2 weeks

1. Basics

- (a) Read in the pisa.jpg image and print out its mode, format and size.
- (b) Convert this image to grey scale
- (c) Without using any inbuilt functions, make the Leaning Tower of Pisa not leaning.

2. 2D Fourier Spectrum and Filtering

- (a) Add salt and pepper noise and gaussian noise on the cameraman image and find their magnitude responses in frequency domain. Comment on the differences in magnitude spectra when you add these noises.
- (b) Filter the noisy images in time domain using mode, median and mean filters. Comment on the filtering performances. Which filter is better for which noise?
- (c) Filter the noisy images in frequency domain. Do you get the same corresponding filtered outputs?

3. Reducing High Frequency Noise

- (a) Read in the cameraman.tif image and add both gaussian and salt and pepper noise together
- (b) Filter the noisy image using α -trimmed filter
- (c) Filter the same noisy image using anisotropic diffusion
- (d) Comment on the results obtained.

4. Reducing Low Frequency Interference

- (a) Take a 2 rupee coin, scan and digitize it to obtain a 512 x 512 image.
 - (a) Enhance it by a suitable contrast stretching transformation and compare it with histogram equalization.
 - (b) Perform unsharp masking and contrast stretch the results. Compare the results obtained.
- (c) Take a picture indoors with light source outside the room and do homomorphic filtering and comment on the difference.

5. Image Degradation and Restoration

- (a) Read the Book.tif image and perform image degradation using motion blur.
- (b) Restore the degraded image using:
 - (a) Inverse filtering
 - (b) Wiener filtering
 - (c) Constrained Matrix Inversion
- (d) Compare and comment on the results obtained.