Short Course on Digital image processing Home Work 2

Use the PDF files 'fpecial.pdf', 'imfilter.pdf', 'imnoise.pdf', 'Noise Removal.pdf' to do this home work

1. Down Load 4 Images from the 'Imaging Modalities' Document. You may pick the ones you like. Two of these images should be color and two black and white. Once you download them use the MATLAB function "imread" to read them into the matrices 'im1,im2,im3,im4' in MATLAB

   e.g. im1 = imread('leaves.jpg')

2. Use the 'size' matalb function to determine if your image is color (3D) or black and white (2D)

   e.g. s = size(im1)

3. Use the color images you downloaded to learn how to convert between various color spaces and examine the resulting images using the MATLAB functions that you learned in Home work for scaling image values from 0 to 1. In particular learn how to use the functions 'rgb2lab', rgb2xyz','rgb2ycbcr' and their reverse functions (e.g. lab2rgb, etc…)

4. Use the MATLAB function 'fspecial' to apply various smoothing and sharpening filter to the Y components of the color images and convert back to RGB to examine the result of the filters.

5. Use the MATLAB function 'imnoise' to add noise to the black and white images and directly to the black and white images. Add Gaussian and salt & pepper noise.

6. Use averaging filter to remove the Gaussian noise and median filter to remove the salt&pepper noise.

7. Use the 'simple-nlm.m' MATLAB function and and 'demo1.pdf' as an example to denoise the Gaussian noise and compare with the averaging method. For nl-mean use the same values for all input variables as in the demo1 example but vary the variable 'h2'

8. Use Gray-world and Scale-by-max methods to color balance the 'BlueImage.jpg' and 'RedImage.jpg' you can download from Ed