

# MATLAB Assignment #2

Name: Mrinmoy Sarkar

Banner ID: 95036-3260

Class: Digital Image Processing(ECEN-657)

Semester: Spring 2018

Date of Submission: 01/30/2018

## **MATLAB program:**

```
%% Matlab Assignment #2
% author : Mrinmoy Sarkar
% email : msarkar@aggies.ncat.edu
% date : 3/2/2018
%%
clear all; close all;

file_name = 'mrinmoy.jpg';
%% load the image
img_color = imread(file_name);
%% Task-1: change to gray scale image
img_gray = rgb2gray(img_color);
img_gray = imresize(img_gray,.4);
%% Task-2: Obtain the enhanced image by Histogram
Equalization
img_enhance_he = histeq(img_gray);
%% Task-3.a: Design histogram specification
n = 256;
hgram = (imhist(img_gray))';
total_pxl = numel(img_gray);
hgram(1,10:70) = hgram(1,10:70) +
hgram(1,71:70+length(10:70));
hgram(1,71:70+length(10:70)) = 0;
hgram(1,191:190+length(130:190)) =
hgram(1,191:190+length(130:190)) + hgram(1,130:190);
hgram(1,130:190)=0;
%% Task-3.b: Apply the histogram specification
img_enhance_hs = histeq(img_gray,hgram);
%% plot all the image
figure
subplot(131)
imshow(img_gray)
title('Original image')
subplot(132)
imshow(img_enhance_he)
title('Histogram equalized image')
subplot(133)
imshow(img_enhance_hs)
title('Histogram specified image')
```

```

%% plot the histogram
figure
subplot(311)
imhist(img_gray)
title('Histogram of Original image')
subplot(312)
imhist(img_enhance_he)
title('Histogram of Histogram equalized image')
subplot(313)
imhist(img_enhance_hs)
title('Histogram of Histogram specified image')
%% Task-4: Smooth image using Gaussian kernel
sigma = 1;
img_smth1 = imgaussfilt(img_gray,sigma);
sigma = 10;
img_smth2 = imgaussfilt(img_gray,sigma);
%% plot image
figure
subplot(131)
imshow(img_gray)
title('Original image')
subplot(132)
imshow(img_smth1)
title('Smoothed image, sigma = 1')
subplot(133)
imshow(img_smth2)
title('Smoothed image, sigma = 10')
%% Task-5: Sharpen image using Laplacian
c = -1;
h = [0 1 0;1 -4 1;0 1 0]; % laplace kernel
img_laplace = imfilter(img_gray,h);
img_srpn = img_gray + c*img_laplace;
%% plot image
figure
subplot(131)
imshow(img_gray)
title('Original image')
subplot(132)
imshow(img_laplace)
title('Laplacian image')

```

```
subplot(133)  
imshow(img_srpn)  
title('Sharpened image')
```

### **Figures:**



Figure 1 : Original image, Histogram equalized image  
and Histogram specified image

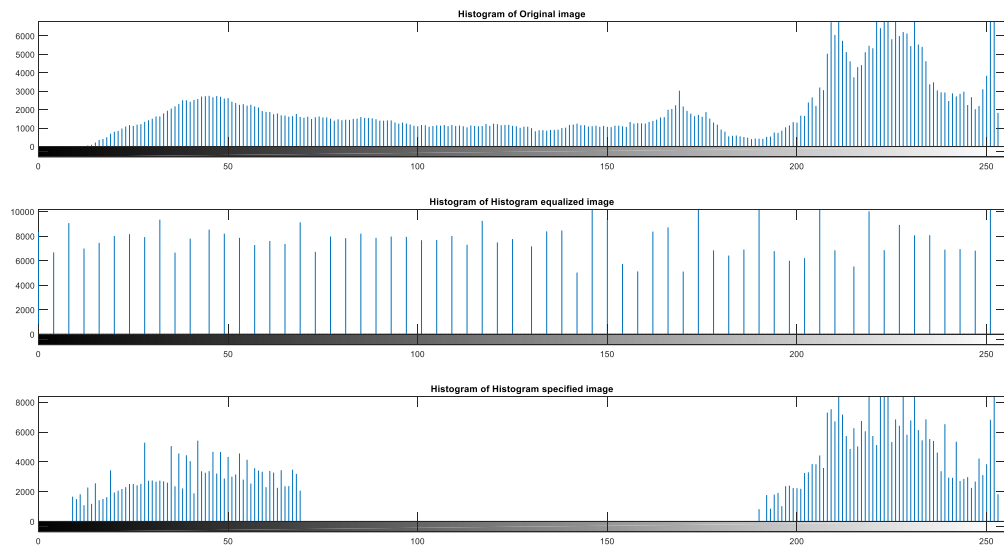


Figure 2 : Histogram of Original image, Histogram of Histogram equalized image, Histogram of Histogram specified image



Figure 3 : Original image, Smoothed image, sigma = 1, Smoothed image, sigma = 10

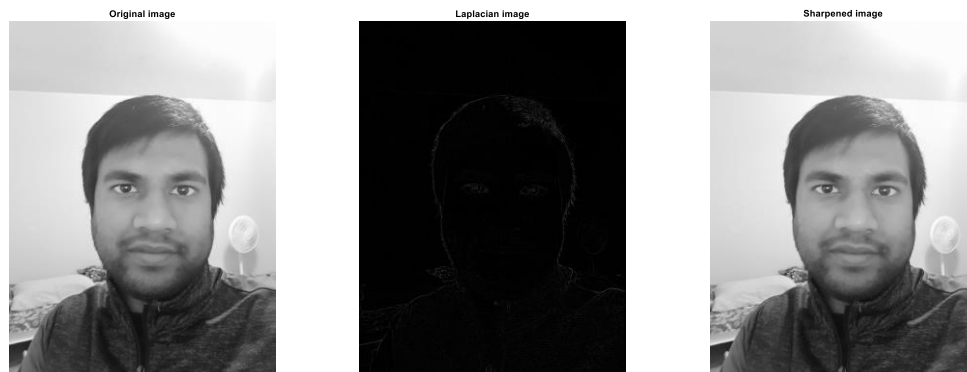


Figure 4 : Original image, Laplacian image, Sharpened image

\*\*\*\*\* The End \*\*\*\*\*