A logo for a university

AI-generated content may be incorrect.

**Lab Report 2**

**Advanced Image Processing Operations**

**Digital Image Processing**

**CSE438**

**Section:** 03

**Semester:** Spring 2025

**Submitted To:**

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1. Use contrast stretching on the image.

img = imread('Picture1.jpg');

gray\_img = rgb2gray(img);

min\_intensity = min(gray\_img(:));

max\_intensity = max(gray\_img(:));

contrast\_stretched\_img = imadjust(gray\_img, [min\_intensity / 255, max\_intensity / 255], [0 1]);

figure;

subplot(1, 2, 1);

imshow(gray\_img);

title('Original Image');

subplot(1, 2, 2);

imshow(contrast\_stretched\_img);

title('Contrast Stretched Image');



1. Apply bit plane slicing on the image.

img = imread("Picture2.jpg");

gray\_img = im2gray(img);

[r, c] = size(gray\_img);

bit\_planes = zeros(r, c, 8);

for i = 1:8

bit\_planes(:,:,i) = bitget(gray\_img, 9-i);

end

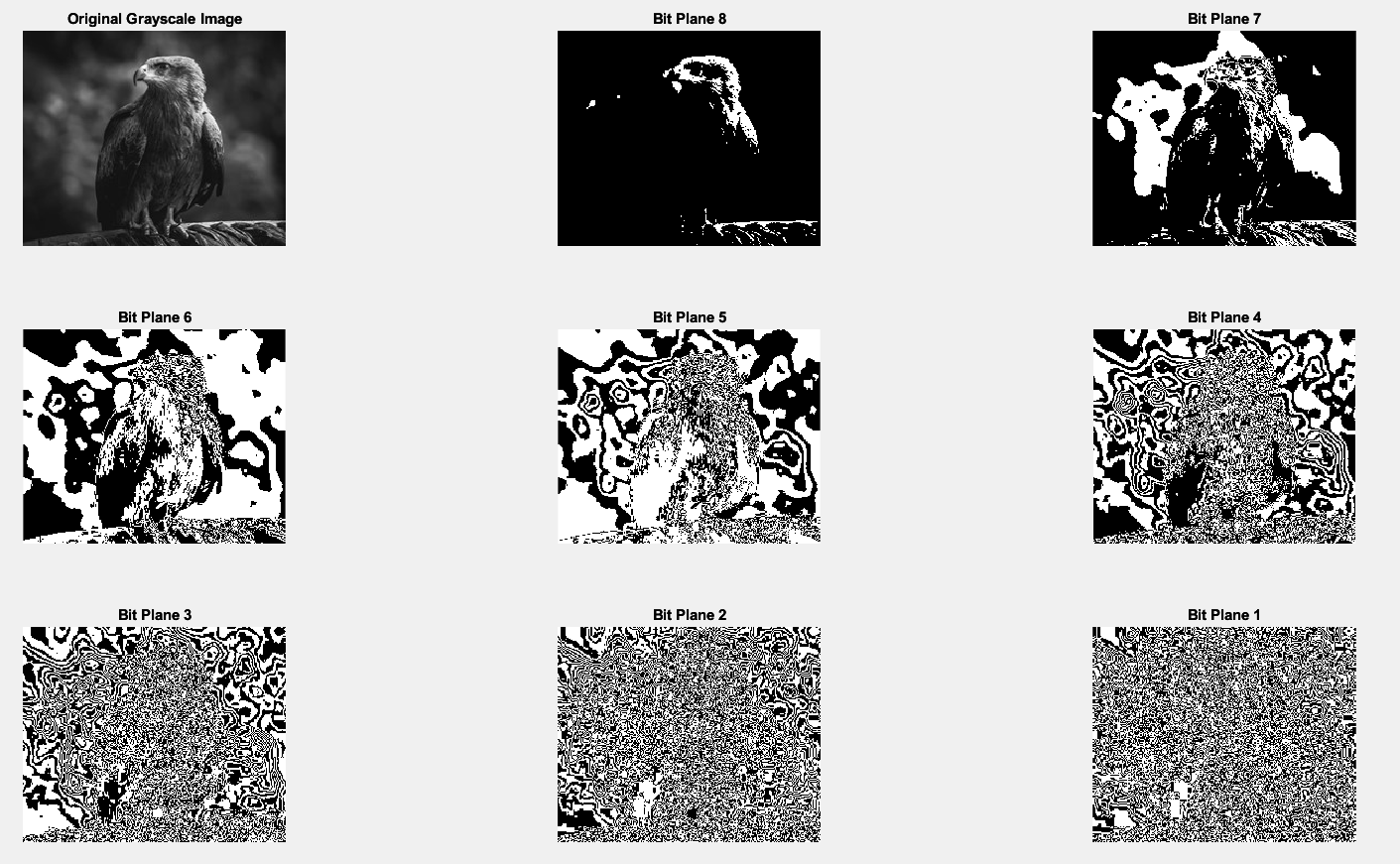
figure;

subplot(3,3,1), imshow(gray\_img), title('Original Grayscale Image');

for i = 1:8

subplot(3,3,i+1), imshow(bit\_planes(:,:,i)), title(['Bit Plane ', num2str(9-i)]);

end



1. Change the contrast of the image using Logarithmic Transformation and Power-law Transformation.

img = imread("Picture3.png");

gray\_img = rgb2gray(img);

normalized\_image = double(gray\_img) / 255;

c = 1;

gamma = 2;

log\_transformed\_image = c \* log(1 + normalized\_image);

gamma\_transformed\_image = c \* (normalized\_image .^ gamma);

figure;

subplot(1, 3, 1);

imshow(gray\_img);

title('Original GrayScale Image');

subplot(1, 3, 2);

imshow(log\_transformed\_image, []);

title('Logarithmic Transformation');

subplot(1, 3, 3);

imshow(gamma\_transformed\_image, []);

title('Power-Law Transformation');

A close-up of a black and white photo

AI-generated content may be incorrect.

1. Adjust the histogram of the following image to match the reference image using histogram matching. Show the histogram of original, reference, and output images.

input\_img = imread("Picture4.jpg");

reference\_img = imread("Picture5.png");

input\_gray = im2gray(input\_img);

reference\_gray = im2gray(reference\_img);

matched\_img = imhistmatch(input\_gray, reference\_gray);

figure;

subplot(3,2,1), imshow(input\_gray), title('Original Input Image');

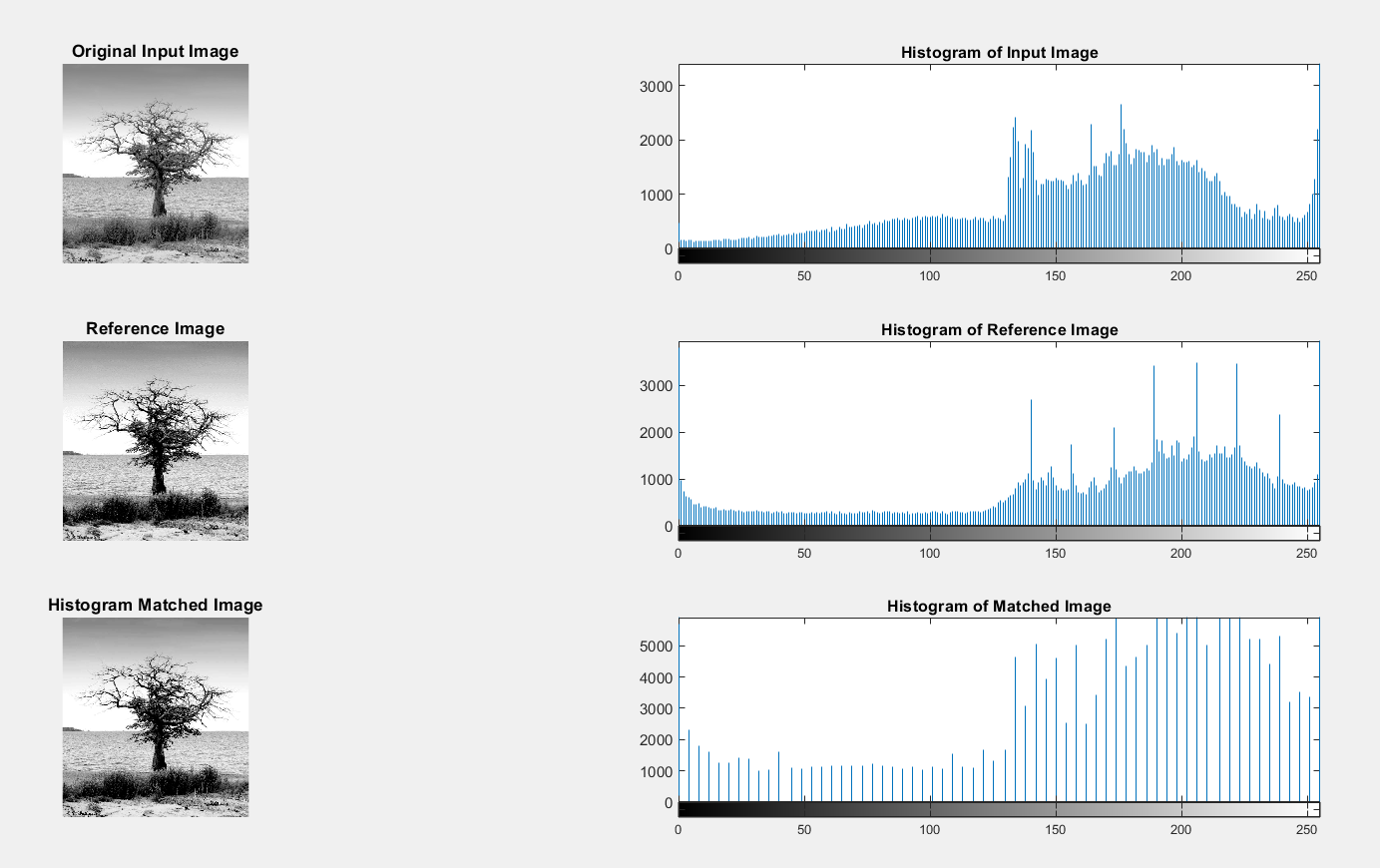
subplot(3,2,2), imhist(input\_gray), title('Histogram of Input Image');

subplot(3,2,3), imshow(reference\_gray), title('Reference Image');

subplot(3,2,4), imhist(reference\_gray), title('Histogram of Reference Image');

subplot(3,2,5), imshow(matched\_img), title('Histogram Matched Image');

subplot(3,2,6), imhist(matched\_img), title('Histogram of Matched Image');



1. Change the contrast of the image using histogram equalization. Show the histogram of both input and output images.

img = imread('Picture6.jpg');

img = rgb2gray(img);

figure;

subplot(2, 2, 1);

imshow(img);

title('Original Image');

subplot(2, 2, 2);

imhist(img);

title('Histogram of Original Image');

equalized\_img = histeq(img);

subplot(2, 2, 3);

imshow(equalized\_img);

title('Equalized Image');

subplot(2, 2, 4);

imhist(equalized\_img);

title('Histogram of Equalized Image');

