## DIP LAB – 8

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**21BEC1022**

**CODE:**

clc

clear all

close all;

img = imread("DUCK.jpg");

h = 1/9\*[1 1 1;1 1 1;1 1 1];

l = [-1 -1 -1;-1 8 -1;-1 -1 -1];

h = double(h);

l = double(l);

img = double(img);

[m,n] = size(img);

y = zeros(size(img));

z = zeros(size(img));

shs = zeros(size(img));

sms = zeros(size(img));

for i=2:m-1

for j=2:n-1 %#ok<ALIGN>

y(i,j) = sum(sum(img(i-1:i+1,j-1:j+1).\*h));

z(i,j) =sum(sum(img(i-1:i+1,j-1:j+1).\*l));

shs(i,j) =sum(sum(y(i-1:i+1,j-1:j+1).\*l));

sms(i,j) =sum(sum(z(i-1:i+1,j-1:j+1).\*h));

end

end

psnr\_m = psnr(y, img);

ssim\_m = ssim(y, img);

psnr\_l = psnr(z, img);

ssim\_l = ssim(z, img);

psnr\_shs = psnr(shs, img);

ssim\_shs = ssim(shs, img);

psnr\_sms = psnr(sms, img);

ssim\_sms = ssim(sms, img);

fprintf('PSNR of smoothed image: %f\n', psnr\_m);

fprintf('SSIM of smoothed image: %f\n', ssim\_m);

fprintf('PSNR of sharpened image: %f\n', psnr\_l);

fprintf('SSIM of sharpened image: %f\n', ssim\_l);

fprintf('PSNR of sharpening on smooth image: %f\n', psnr\_shs);

fprintf('SSIM of sharpening on smooth image: %f\n', ssim\_shs);

fprintf('PSNR of smoothening on sharp image: %f\n', psnr\_sms);

fprintf('SSIM of smoothening on sharp image: %f\n', ssim\_sms);

figure;

subplot(3, 1, 1), imshow(uint8(img),[]), title('Original Image');

subplot(3, 1, 2), imshow(uint8(y),[]), title('Smoothed Image');

subplot(3, 1, 3), imshow(uint8(z),[]), title('Sharpened Image');

figure;

subplot(2,1,1),imshow(uint8(shs),[]),title("sharpening on smooth image");

subplot(2,1,2),imshow(uint8(sms),[]),title("smoothening on sharp image");

**OUTPUT :**



