MFC – 4 ASSIGNMENT – 6

SHRUTHI RENGARAJAN

BATCH: B

CB.EN.U4AIE22154

*Code:*

clc; clear variables; close all;

img = imread("D:\AMRITA\Sem4\MFC4\Assignment6\Image.jpeg");

img = rgb2gray(img);

img = imresize(img, [50, 50]);

img = reshape(img,[],1);

act\_Size = size(img);

n = act\_Size(1);

p = 500;

C = randn(p, n);

theta = C\*dctmtx(n) ;

y = C \* double(img);

cvx\_begin

variable s(n)

minimize ( norm(s, 1) )

subject to

norm(y - theta\*s, 2) <= 0 ;

cvx\_end

% Reconstruct the image

s\_resz = dctmtx(n) \* s;

s\_resz = reshape(s\_resz, [50, 50]); % Reshape to image size

s\_resz = uint8(s\_resz); % Convert to uint8 format

subplot(2, 1, 1)

imshow(reshape(img, 50, 50))

subplot(2, 1, 2)

imshow(s\_resz)

%%

cvx\_begin

variable s1(n)

minimize ( norm(s1, 1) )

subject to

theta\*s1 == y ;

cvx\_end

% Reconstruct the image

s\_resz1 = dctmtx(n) \* s1;

s\_resz1 = reshape(s\_resz1, [50, 50]); % Reshape to image size

s\_resz1 = uint8(s\_resz1); % Convert to uint8 format

subplot(2, 1, 1)

imshow(reshape(img, 50, 50))

subplot(2, 1, 2)

imshow(s\_resz)

%%

subplot(3,2,1)

plot(s)

title('L1')

ylim([-.2 .2])

grid on

subplot(3,2,[3 5])

[hc, h] = hist(s, [-.1:.01: .1]);

bar(h,hc,'r')

axis([-.1 .1 -20 1000]);

subplot(3,2,2)

plot(s1)

title('L2')

ylim([-.2 .2])

grid on

subplot(3,2,[4 6])

[hc, h] = hist(s, [-.1:.01: .1]);

bar(h,hc,'r')

axis([-.1 .1 -20 1000]);

%%

s\_pinv = pinv(C \* dctmtx(n)) \* y;

subplot(2,1,1)

plot(s\_pinv)

title('L2')

ylim([-.2 .2])

grid on

subplot(2,1,2)

[hc, h] = hist(s\_pinv, [-.1:.01: .1]);

bar(h,hc,'r')

axis([-.1, .1, -20, 1000]);

%%

s\_resz = dctmtx(n)'\*s;

s\_resz = reshape(s\_resz, [50, 50]); % Reshape to match the original image size

s\_resz = uint8(s\_resz);

imwrite(s\_resz, 'D:\AMRITA\Sem4\MFC4\Assignment6\image\_1.jpg');

s\_resz = dctmtx(n)'\*s1; % Corrected variable name

s\_resz = reshape(s\_resz, [50, 50]); % Reshape to match the original image size

s\_resz = uint8(s\_resz);

imwrite(s\_resz, 'D:\AMRITA\Sem4\MFC4\Assignment6\image\_2.jpg');

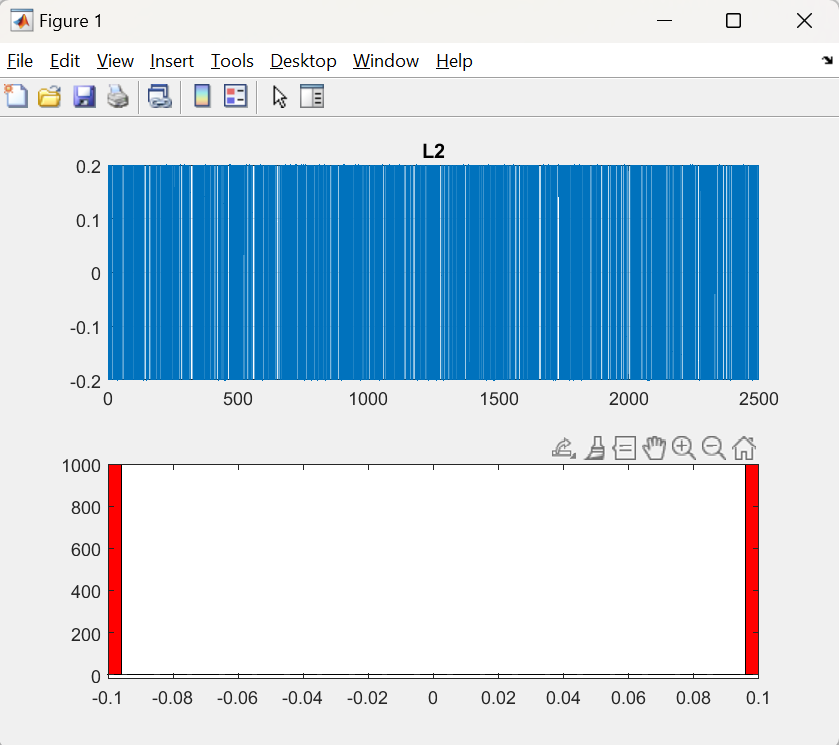
s\_resz = dctmtx(n)'\*s\_pinv;

s\_resz = reshape(s\_resz, [50, 50]); % Reshape to match the original image size

s\_resz = uint8(s\_resz);

imwrite(s\_resz, 'D:\AMRITA\Sem4\MFC4\Assignment6\image\_3.jpg');

*Output:*



Input:  


Output:





