Embed

```
clc
close all

%host

rgbimage=imread('host.jpg');
figure;imshow(rgbimage);title('original color image');
[h_LL,h_LH,h_HL,h_HH]=dwt2(rgbimage,'haar');
dec2d = [...
        h_LL,     h_LH;     ...
        h_HL,     h_HH      ...
        ];
figure,imshow(uint8(dec2d));title('DWT2 of original color
image');

%watermark

rgbimage=imread('watermark.jpg');
figure;imshow(rgbimage);title('Watermark image');
[w_LL,w_LH,w_HL,w_HH]=dwt2(rgbimage,'haar');
dec2d = [...
        w_LL,     w_LH;     ...
        w_HL,     w_HH      ...
        ];
figure,imshow(uint8(dec2d));title('DWT2 of Watermark image');

%Equation1

newhost_LL = (0.30* h_LL) + (0.30*w_LL);

%output

rgb2=idwt2(newhost_LL,h_LH,h_HL,h_HH,'haar');
figure;imshow(uint8(rgb2));title('Watermarked image');
imwrite(uint8(rgb2),'Watermarked.jpg');
```

Extract

```
clc
close all

%watermarked

rgbimage=imread('watermarked.jpg');
figure;imshow(rgbimage);title('Watermarked image');
[wm_LL,wm_LH,wm_HL,wm_HH]=dwt2(rgbimage,'haar');
dec2d = [...
        wm_LL,     wm_LH;     ...
        wm_HL,     wm_HH      ...
        ];
figure,imshow(uint8(dec2d));title('DWT2 of Watermarked image');

%Equation2

newwatermark_LL=(wm_LL-0.30*h_LL)/0.30;

%output

rgb2=idwt2(newwatermark_LL,w_LH,w_HL,w_HH,'haar');
figure,imshow(uint8(i)),title('Extracted watermark')
**********************************************************************



%figure;imshow(uint8(rgb2));
i = imread('watermark.jpg');

%imwrite(uint8(rgb2),'Ewatermarked.jpg')


%filter

%imwrite(uint8(rgb2)),'Ewatermarked.jpg')

%avrage
%figure,imshow((uint8(rgb2);
%avrage=fspectial('avrage',3);
%RGB_Avrage= imfilter(imshow(uint8(rgb2)),avrage);
%figure,imshow(RGB_Avrage),

%gaussian
%gaussian=fspecial('gaussian',3,0.5);
%RGB_Gaussian= imfilter(I,gaussian);
%figure,imshow(RGB_Gaussian),
```

Histo

```
%image 1
I = imread('watermark.jpg');
figure,imshow(I)
R=imhist(I(:,:,1));
G=imhist(I(:,:,2));
B=imhist(I(:,:,3));

subplot(3,1,1),plot(R,'r')
subplot(3,1,2),plot(G,'g')
subplot(3,1,3),plot(B,'b')



%image 2
x = imread('Ewatermarked.jpg');
figure,imshow(x)
R=imhist(I(:,:,1));
G=imhist(I(:,:,2));
B=imhist(I(:,:,3));

subplot(3,1,1),plot(R,'r')
subplot(3,1,2),plot(G,'g')
subplot(3,1,3),plot(B,'b')
```

psnr+mse

```
L=(0:255);%
 pixel_max = (L-1); % setting the maximum value that a pixel can assume
  % comment the following two lines if the frames are already in YCbCr
img1= imread('watermark.jpg');
img2=imread('Ewatermarked.jpg');
img1 = rgb2ycbcr(img1); % converting from RGB to YCbCr
img2 = rgb2ycbcr(img2); % converting from RGB to YCbCr

img1 = img1(:,:,1); % extracting the luminance component (x)
img2 = img2(:,:,1); % extracting the luminance component (Y)

img1 = img1(:); % converts a matrix into a monodimensional array
img2 = img2(:); % converts a matrix into a monodimensional array
x=0;

img1=double(img1);
img2=double(img2);

x=(img1-img2).^2;

mse=mean(x); % here is the MSE
psnr=10*log10(((pixel_max).^2)/(mse)); % and here is the PSNR
```

```
%plot(L,psnr,'r+')% relationship between maximum host and psnr for  just mse
%title ('relationship between maximum value host and psnr for  just mse ')
%xlabel('L');
%ylabel('PSNR(dB)');
```