

**Name: Attique Ur Rehman Aamir**

**Roll No. MSDSF21M030**

**Teacher Name: Dr. Syed Muhammad Ali**

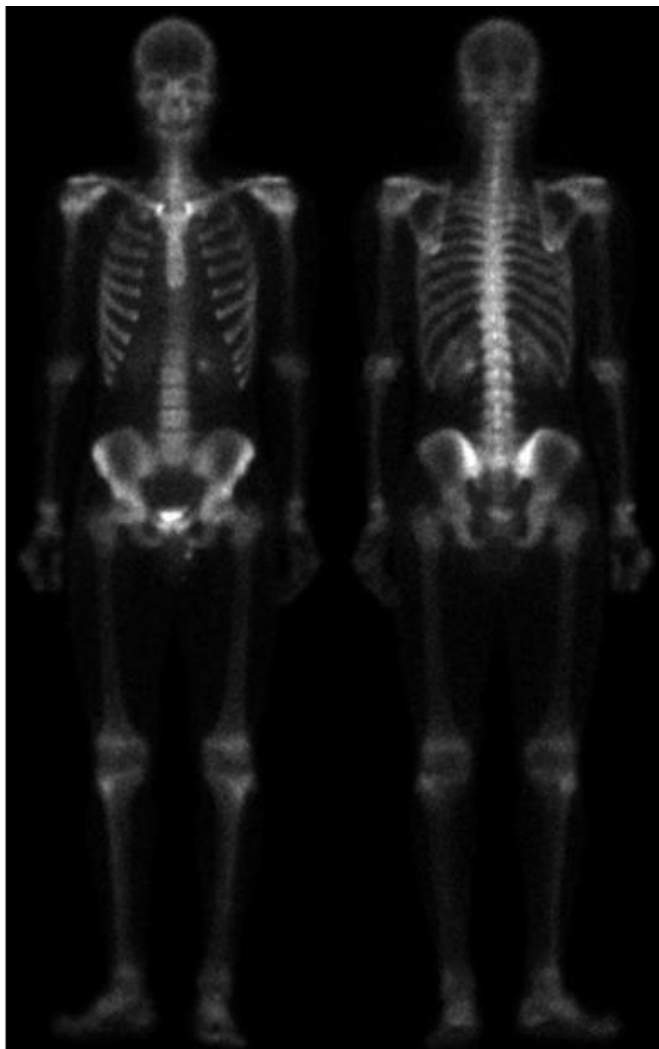
**Assignment: Home Work 2**

## Intensity Transformations and Spatial Filtering

### 3.7: Combining Spatial Enhancement Methods

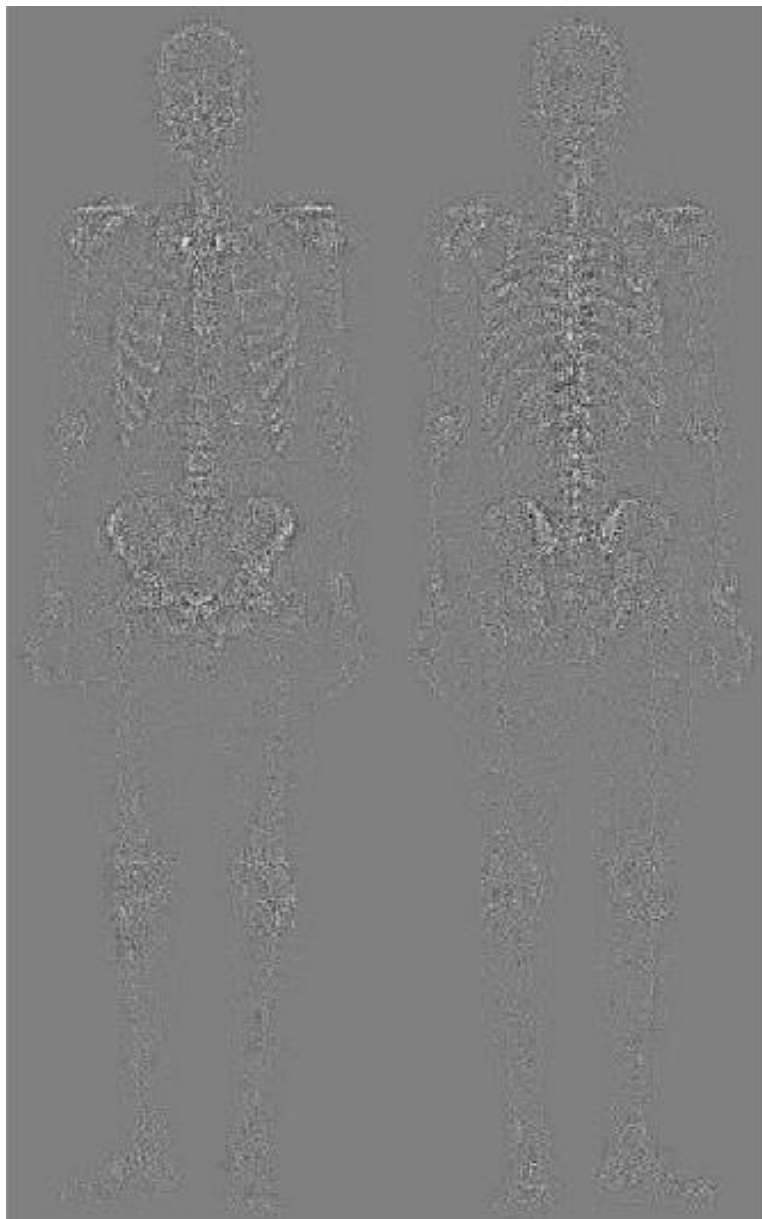
#### a) Real Image:

```
I2 = imread('E:\matlab\R2020a\bin\Image for HW-2.tif')  
I = im2double(I2)  
figure;  
imshow(I)  
title('Original Image');
```



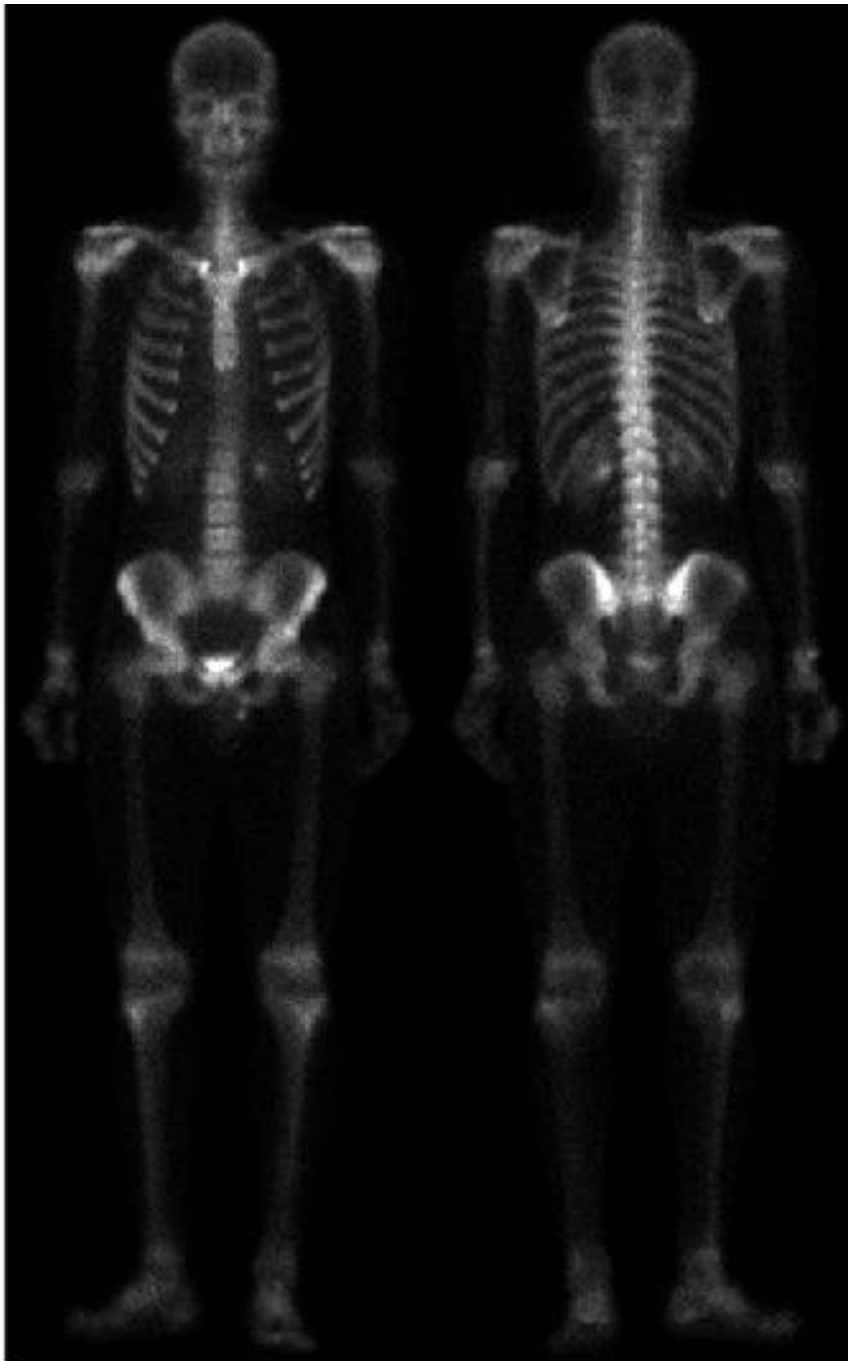
## b) Edge Detection using Laplacian of Real Image:

```
laplacian = 1/16*[-1 -1 -1;-1 8 -1; -1 -1 -1];  
  
%edge detection by laplacian mask  
  
output = imfilter(I,laplacian);  
  
%subplot(4,4,2);  
figure;  
imshow(output,[])  
title('laplacian mask');
```



### c) Adding Laplacian and Original Image.

```
output1 = imadd(output,I);  
subplot(4,4,3);  
figure;  
imshow(output1)  
title('Laplacian image');
```

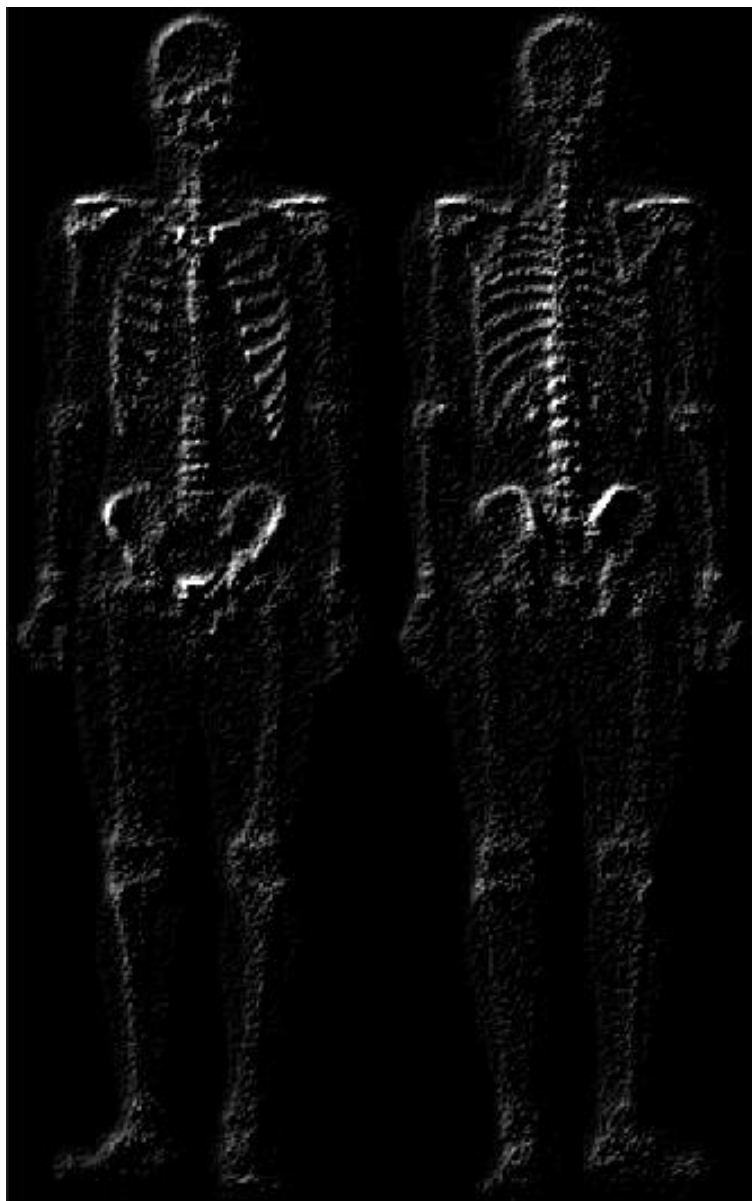


#### d) Applying Sobel Filter to Original Image

```
Sobelx = [-1 -2 -1;0 0 0;1 2 1];  
Sobely = [-1 0 1;-2 0 2;-1 0 1];
```

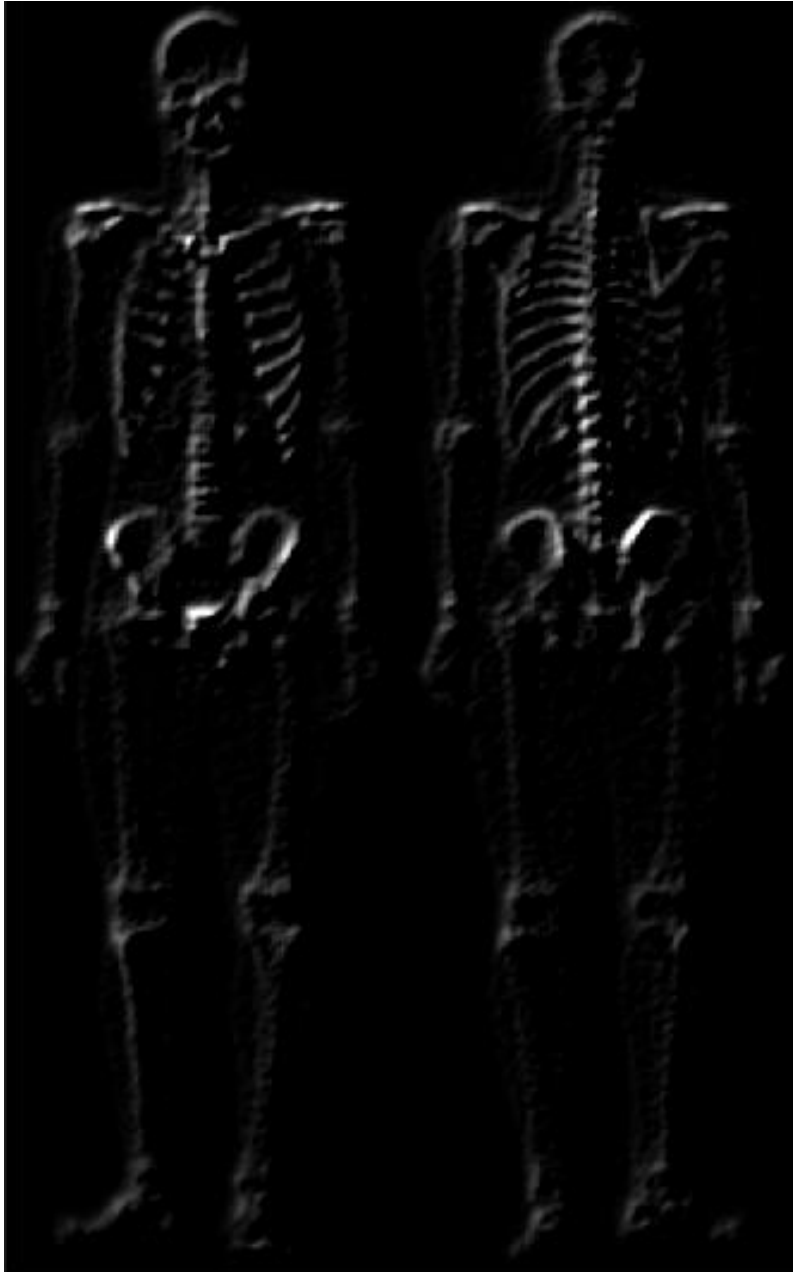
```
gx = imfilter(I,Sobelx);  
gy = imfilter(I,Sobely);
```

```
output2 = (gx+gy);  
subplot(4,4,4);  
figure;  
imshow(output2)  
title('Sobel Image');
```



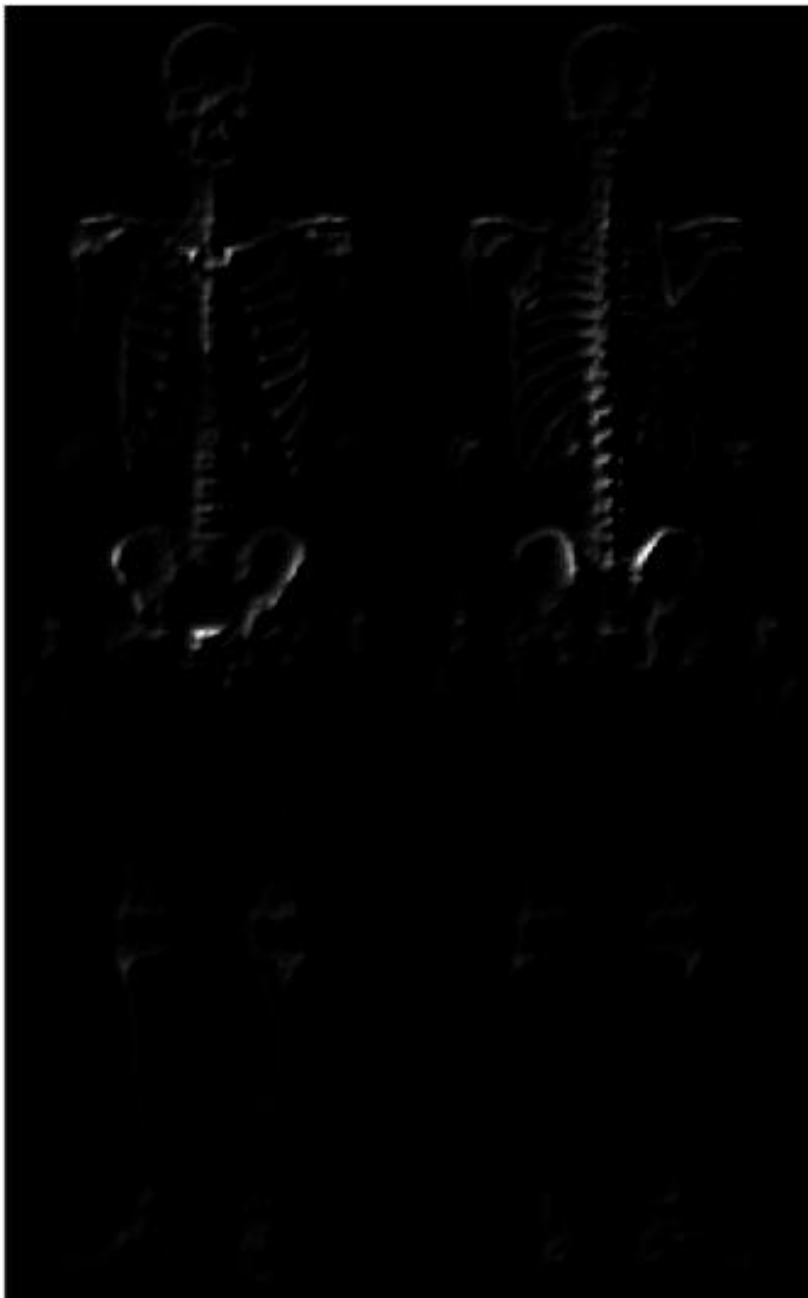
### e) Blurring by applying Averaging smoothing Gradient:

```
averagingmask = 1/25*ones([5 5]);  
  
smoothedgradient = imfilter(output2,averagingmask);  
figure;  
imshow(smoothedgradient)  
title('Averaging Mask');
```



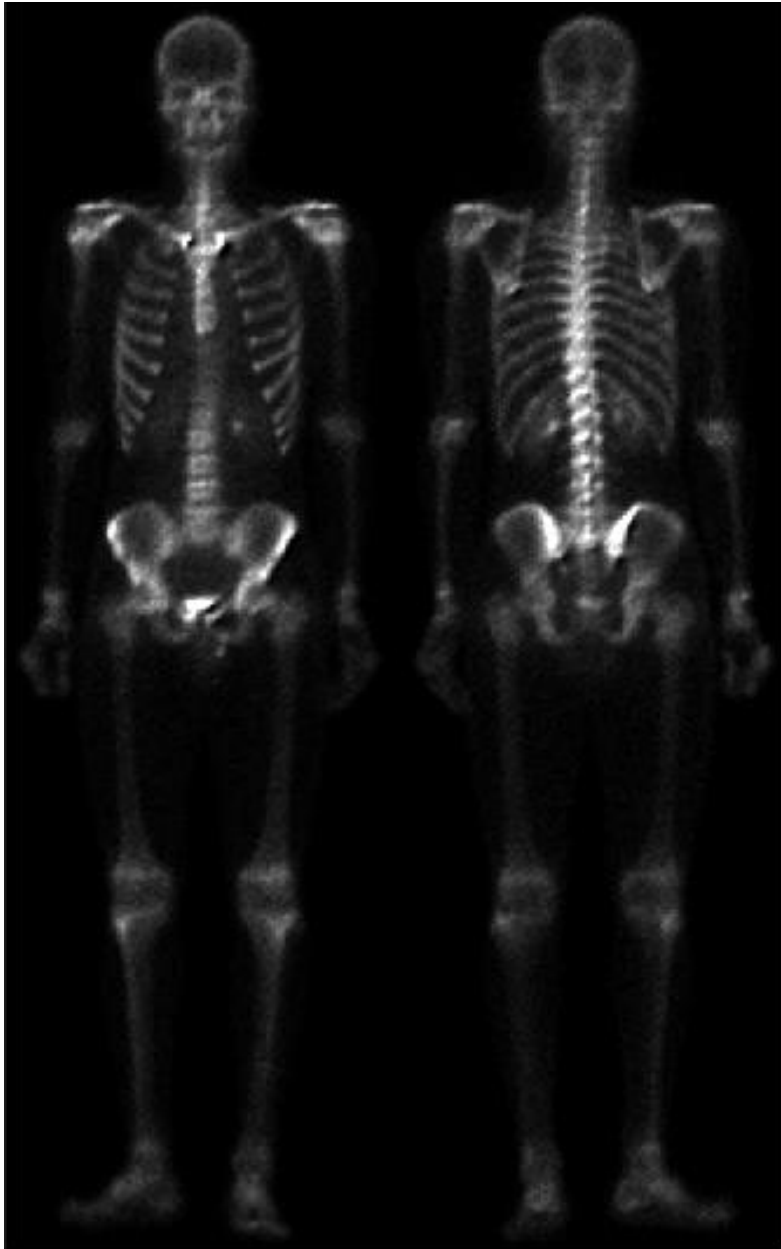
## f) Mask Image formed by Product of Laplacian and Smoothed Gradient

```
ProductoflaplaciannSmoothedgradient = immultiply(output1,smoothedgradient);  
subplot(4,4,6);  
figure;  
imshow(ProductoflaplaciannSmoothedgradient)  
title('*ofLnSG');
```



### g) Sharpened Image obtained by Adding real image and Mask image:

```
SumofRealImgnProductoflaplaciannSmoothedgradient =  
imadd(I,ProductoflaplaciannSmoothedgradient);  
subplot(4,4,7);  
figure;  
imshow(SumofRealImgnProductoflaplaciannSmoothedgradient)  
title('+ofInPLnSG');
```





## h) By applying Power Law Transformation to Sharpened Image:

```
PowerLawTransformation =  
1*SumofRealImgnProductoflaplaciannSmoothedgradient.^0.5;  
%subplot(4,4,8);  
figure;imshow(PowerLawTransformation)  
title('Power Law Transformatin');
```

