

BİL421-İmge İşleme Lab-3

1. Smoothing

```
clear, clc
I = imread('cameraman.tif');
subplot(2,2,2);
imshow(I); title('Original Image');

B = fspecial('average',5);
Blur = imfilter(I,B,'replicate');
subplot(2,2,1);
imshow(Blur);title('Average Blurred size=5');

subplot(2,2,3);
G = fspecial('gaussian', 5, 2);
Blur = imfilter(I,G,'replicate');
imshow(Blur);title('Gaussian Blurred size=5 sigma=2');

G = fspecial('gaussian', 15, 5);
Blur = imfilter(I,G,'replicate');
subplot(2,2,4);
imshow(Blur);title('Gaussian Blurred size=11 sigma=5');
```

2. Unsharp filtering

```
clear, clc
I=imread('cameraman.tif');
B = fspecial('average',11);
Blur = imfilter(I,B,'replicate');
X=I-Blur;

figure,subplot(2,2,1);
imshow(I); title('Original Image');

subplot(2,2,2);
imshow(I+X); title('Original Image + high freq. components');

H = fspecial('unsharp');
sharpened = imfilter(I,H,'replicate');
subplot(2,2,4);
imshow(sharpened); title('Sharpened Image');
```

3. Order Filtering

```
clear, clc
I=imread('cameraman.tif');
subplot(2,2,1);
imshow(I); title('Original Image');
```

```
K = medfilt2(I);  
subplot(2,2,2);  
imshow(K); title('Median-Filter size:[3 3]');
```

```
subplot(2,2,3);  
K = medfilt2(I,[7 7]);  
imshow(K); title('Median-Filter size:[7 7]');
```

```
subplot(2,2,4);  
K = medfilt2(I,[11 11]);  
imshow(K); title('Median-Filter size:[11 11]');
```

```
M = ordfilt2(I,61,ones(11,11)); %11-by-11 median filter  
Mn = ordfilt2(I,1,ones(11,11)); %11-by-11 min filter  
Mx = ordfilt2(I,121,ones(11,11)); %11-by-11 max filter
```

4. 2-D Convolution using “conv2” function

```
clear, clc  
I = imread('cameraman.tif');  
subplot(2,1,1);  
imshow(I); title('Original Image');
```

```
B = ones(5)*0.04;  
Blur = uint8(conv2(double(i),B,'same'));  
subplot(2,1,2);  
imshow(Blur);title('Average Blurred size=5');
```