

```
clc;  
clear all;  
close all;
```

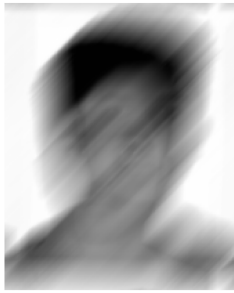
```
blur_len = 45
```

```
blur_len = 45
```

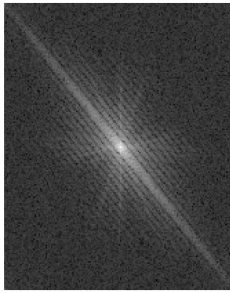
```
blur_angle = 45
```

```
blur_angle = 45
```

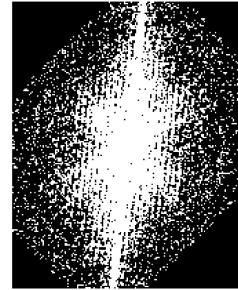
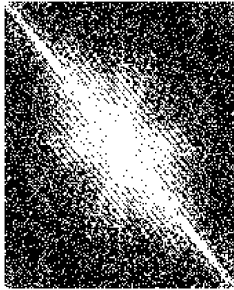
```
F= imread('AADI_IMAGE.jpeg');  
F=rgb2gray(F);  
H = fspecial('motion',blur_len, blur_angle);  
G = imfilter(F,H,'circular');  
subplot(2,2,1); imshow(G);xlabel('MOTION BLURRED');  
z1=fftshift(fft2(G));  
  
z2=log(1+abs(z1));  
subplot(2,2,2); imshow(z2, []);xlabel('SPECTRAL');  
z3 = double(z2>mean(z2(:)));  
z3 = logical(z3);  
subplot(2,2,3); imshow(z3, []);  
%IMAGE IS ROATATED BACK , BY THE ANGLE DETETED  
rotate=imrotate(z3, -(blur_angle), 'bilinear','crop');  
subplot(2,2,4); imshow(rotate, []);xlabel('ROTATED SPECTRAL LINES');
```



MOTION BLURRED

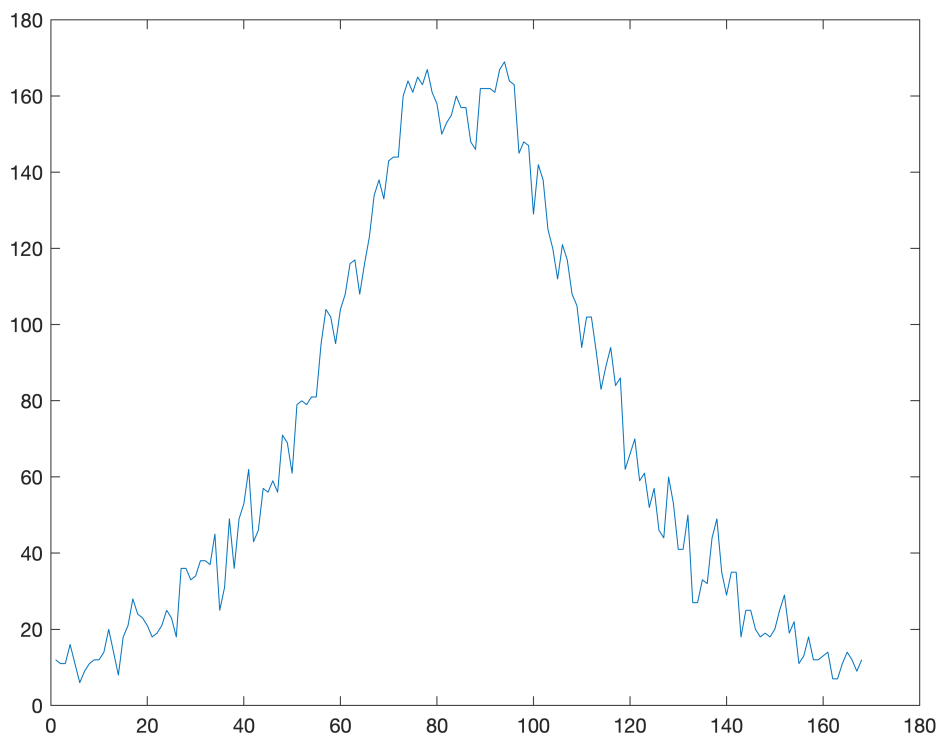


SPECTRAL



ROTATED SPECTRAL LINES

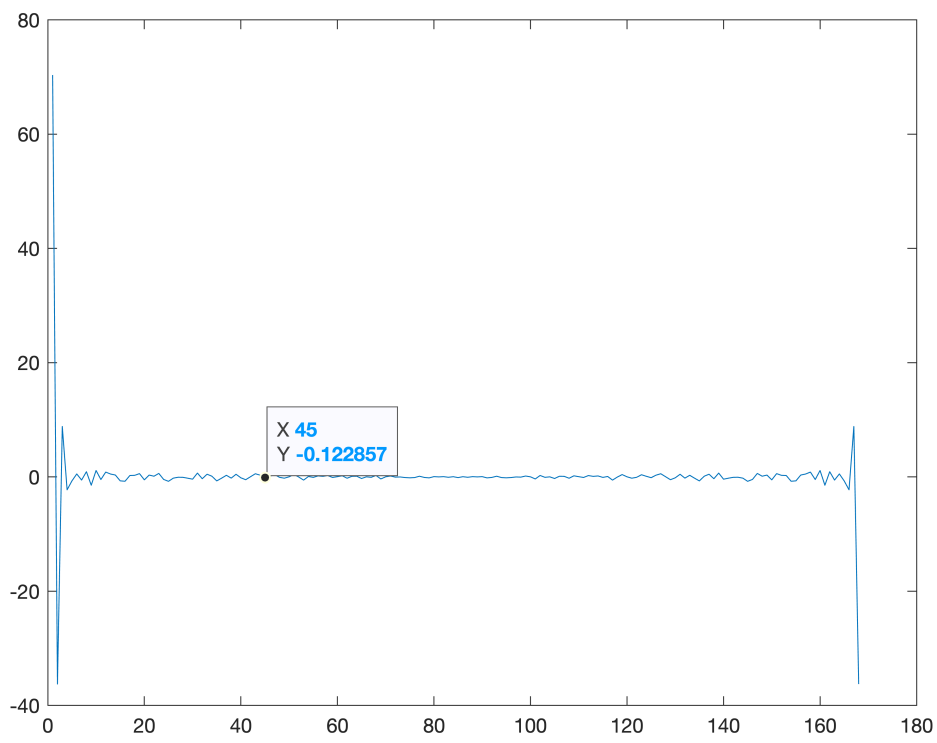
```
for i = 1:168
    one_dim(i) = sum(rotate(:,i));
end
one_d = uint8(one_dim);
figure(3); plot(one_d);
```



```
inv_one_dim = ifft(one_d);  
figure(4); imshow(inv_one_dim);
```

Warning: Displaying real part of complex input.

```
real_inv = real(inv_one_dim);  
figure(5); plot(real_inv);
```



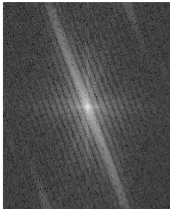
## ANGLE DETECTION

```
clc;  
close all;  
clear all;  
o=25;  
C=imread("AADI_IMAGE.jpeg");  
h=fspecial("motion",30,o);  
z=imfilter(C,h,'conv','circular');  
imshow(z);xlabel('BLURRED IMAGE');
```



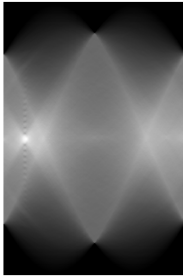
BLURRED IMAGE

```
C=rgb2gray(z);  
C=fft2(C);  
C=fftshift(C);  
C=abs(log(1+C));  
figure(),  
imshow(C,[]);xlabel('SPECTRAL LINES');
```



SPECTRAL LINES

```
R=radon(C);  
figure();  
imshow(R,[]);xlabel('RADON TRANSFORM');
```



RADON TRANSFORM

```
figure();
R=edge(R,"canny",0.1);
imshow(R,[]);xlabel('EDGE DETECTION');
```



EDGE DETECTION

```
H=zeros([1,180]);
for j=5:175
col=R(:,j);
H(1,j)=var(col);
end
[M, I1] = max(H);
sum(I1)=-inf;
angle_detected=I1
```

```
angle_detected = 25
```

## INVERSE FILTERING

```
PSF = fspecial('motion',30,I1);
wnr1 = deconvwnr(z,PSF);
h=fspecial('average',3);
wnr1=imfilter(wnr1,h);
figure(10),
subplot(121);imshow(z);title('BLURRED')
subplot(122);imshow(wnr1);title('DE-BLURRED')
```

**BLURRED**



**DE-BLURRED**

