```
img = imread("rock.png");
figure;
hFig = imshow(img);
```

```
info = imfinfo("rock.png");
disp(['image width:' num2str(info.Width) '; image height:' num2str(info.Height) '; colo
```

```
image width:828; image height:611; color depth:24
```

```
class(img)
```

```
ans =
'uint8'
```

```
size(img)
```

```
ans = 1×3
   611   828     3
```

```
tmpImg=uint8(zeros(size(img)));
tmpImg(:,:,1)=img(:,:,1)
```

```
tmpImg = 611×828×3 uint8 array
```

```
tmpImg(:,:,1) =

    71    72    71    69    71    72    70    69    68    70    72    73    73    73    72    72    69
     ⋮
```

```
figure; imshow(tmpImg); % display the red channel
```

```
tmpImg=uint8(zeros(size(img)));
tmpImg(:,:,2)=img(:,:,2)
```

```
tmpImg = 611×828×3 uint8 array
tmpImg(:,:,1) =

     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0
     ⋮
```

```
figure; imshow(tmpImg); % display the green channel
```

```
tmpImg=uint8(zeros(size(img)));
tmpImg(:,:,3)=img(:,:,3)
```

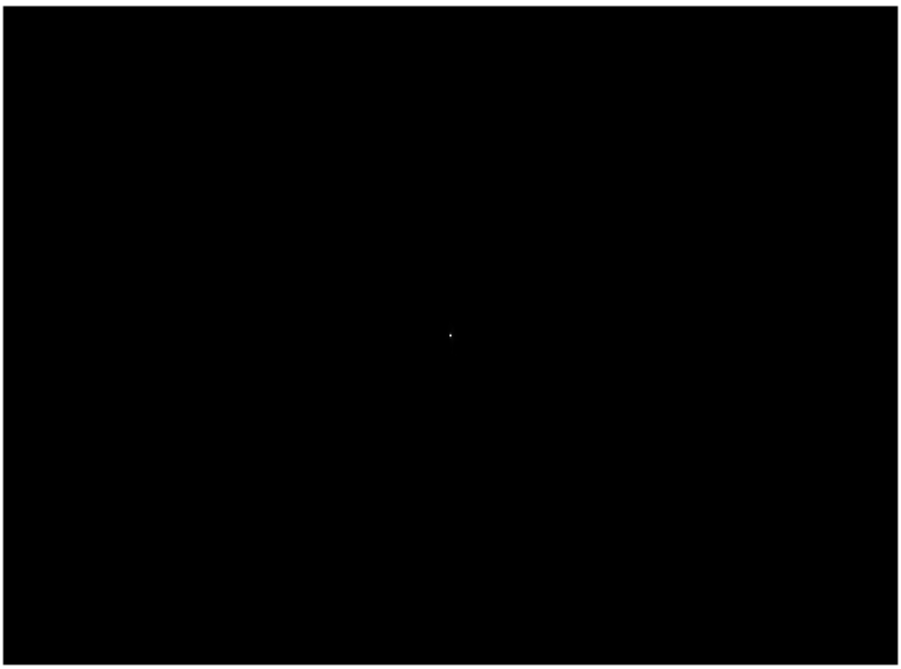
```
tmpImg = 611×828×3 uint8 array
tmpImg(:,:,1) =

   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
     ⋮
```

```
figure; imshow(tmpImg); % display the blue channel
```

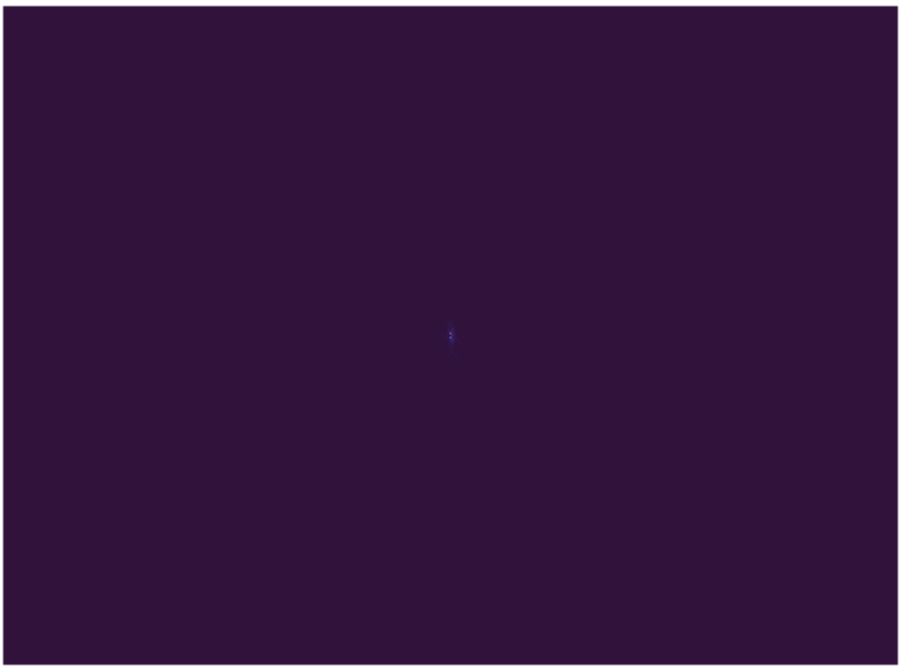
```
imgGray=rgb2gray(img);
imshow(imgGray);
```

frequency space

```
imgFFT=fft2(imgGray);
imagesc(abs(fftshift(imgFFT))); colormap gray; axis equal; axis off;
```

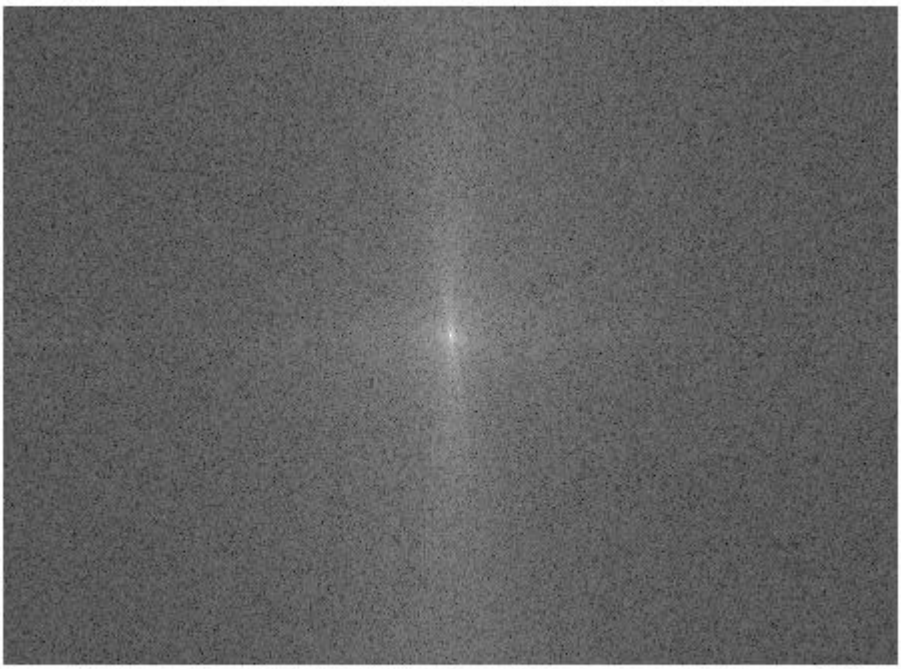


```
imagesc(abs(fftshift(imgFFT))); colormap turbo; axis equal; axis off;
```



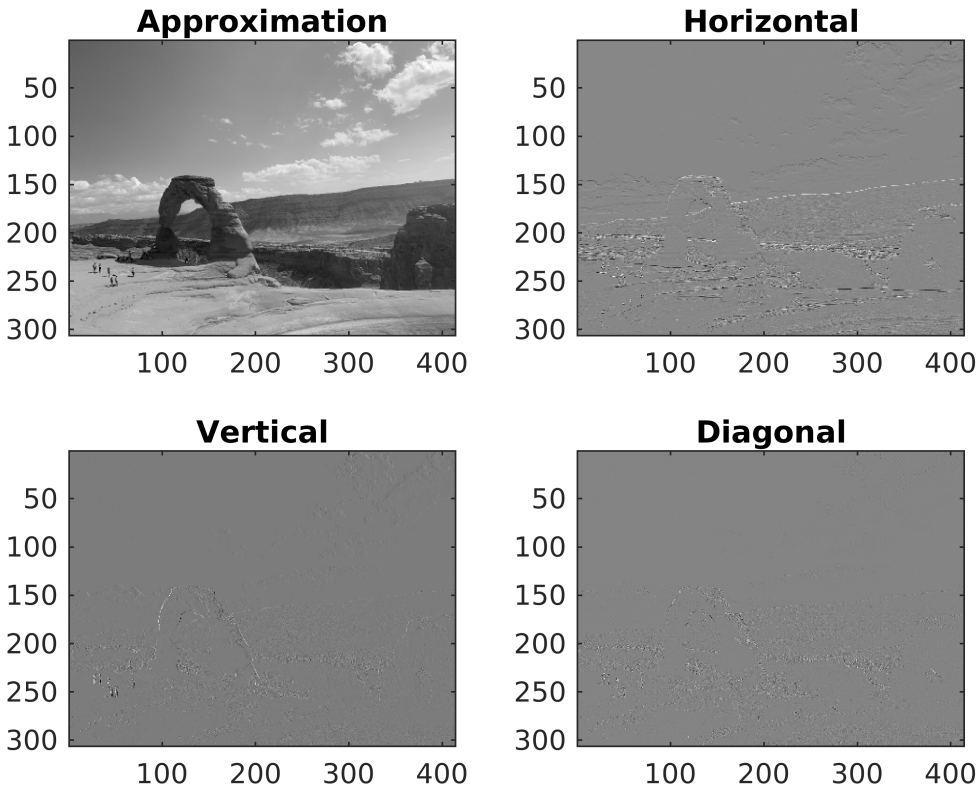
frequency space in log scale

```
imgFFTb=abs(fftshift(imgFFT));
imagesc(log(abs(fftshift(imgFFT))+1)); colormap gray; axis equal; axis off;
```



spatial-frequency view

```
[LoD,HiD] = wfilters('haar', 'd');
[cA,cH,cV,cD] = dwt2(imgGray,LoD,HiD,'mode','symh');
figure;
subplot(2,2,1); imagesc(cA); colormap gray; title('Approximation')
subplot(2,2,2); imagesc(cH); colormap gray; title('Horizontal')
subplot(2,2,3); imagesc(cV); colormap gray; title('Vertical')
subplot(2,2,4); imagesc(cD); colormap gray; title('Diagonal')
```



Edge Features

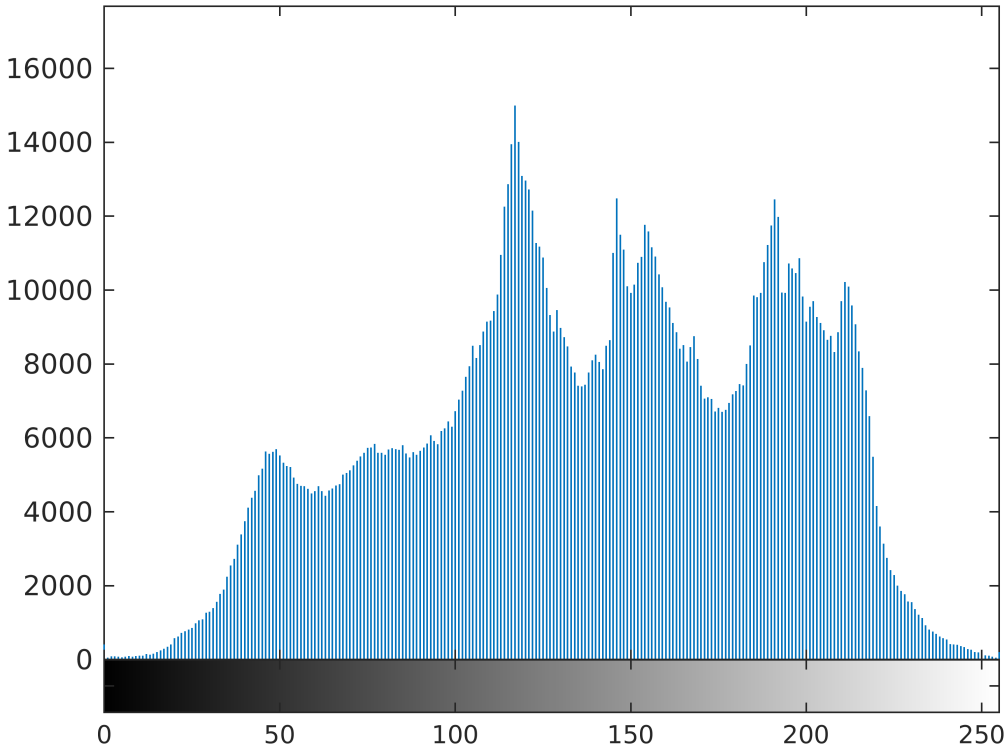
```
figure;
imagesc(edge(imgGray, 'sobel', 0.04)); colormap gray; axis equal; axis off;
```

```
figure;
imagesc(edge(imgGray, 'sobel', 0.1)); colormap gray; axis equal; axis off;
```

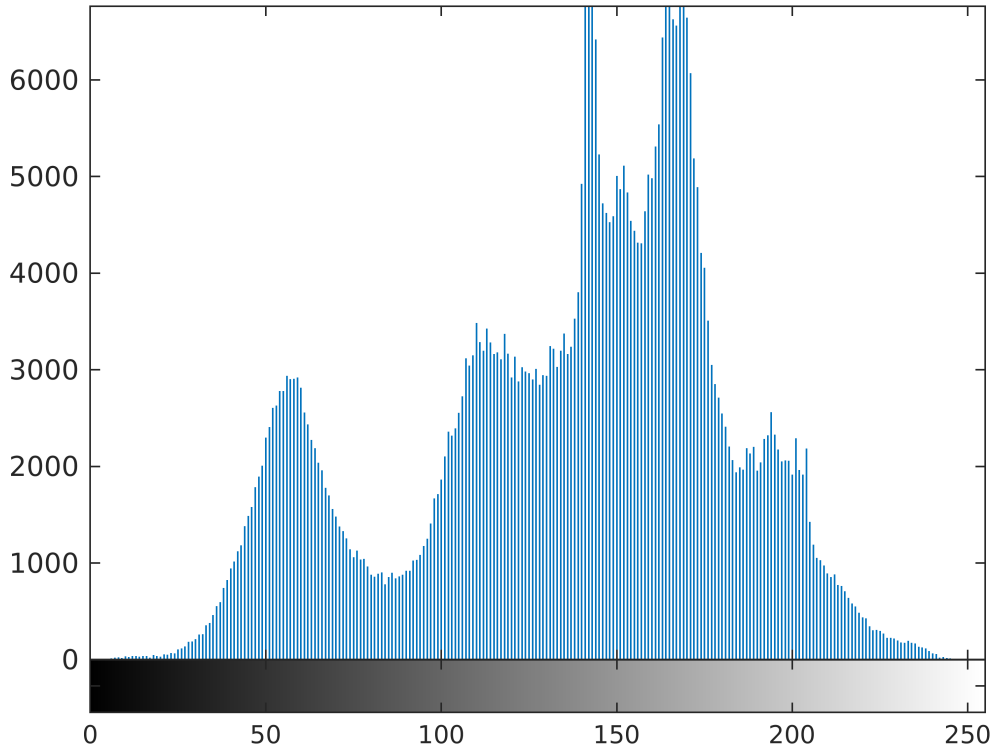
```
imagesc(uint8(double(imgGray)+255*double(edge(imgGray, 'sobel', 0.04)))); colormap gray
```

Image Histogram

```
imhist(img);
```




```
imhist(imgGray);
```


6000
5000
4000
3000
2000
1000
0
0
50
100
150
200
250