q4

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0.1 Apply Fourier transform on multiple images

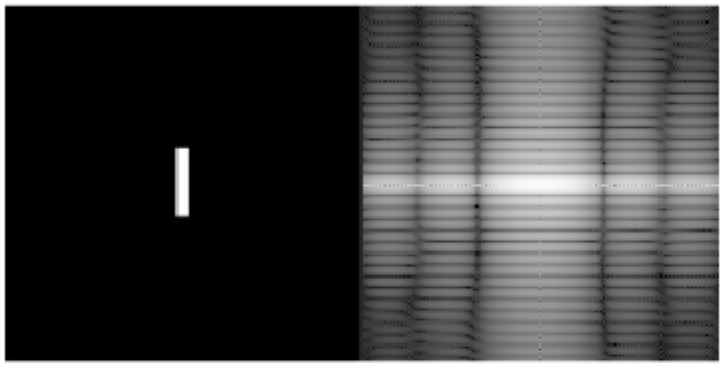
0.1.1 For cleaner fft we do some transformations

```
function [f] = fourier_transform(img)
    f = fft2(img);
    f = fftshift(f);
    f = abs(f);
    f = log(f+1);
    f = mat2gray(f);
    imshowpair(img,f,'montage');

end
```

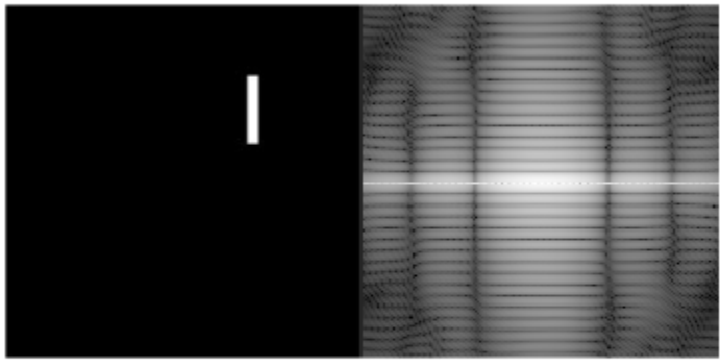
0.1.2 Img1a

```
In [2]: img = imread('./Img1a.png');
        fourier_transform(img);
```



0.1.3 Img1b

```
In [1]: img = imread('./Img1b.png');
        fourier_transform(img);
```

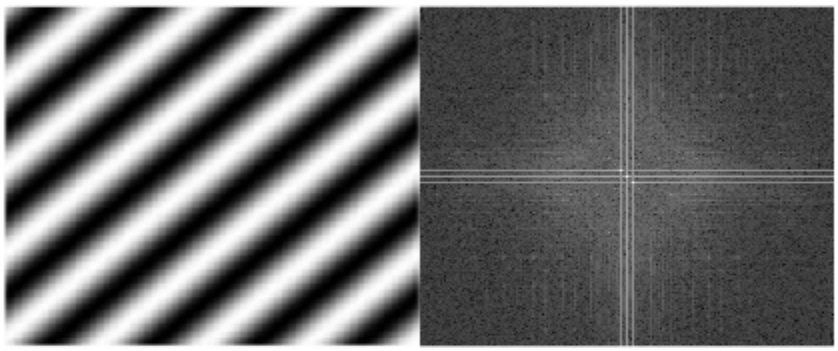


0.1.4 Intresting result

- We can notice that the rectangle shifted but the fourier domain of the image doesn't change
- Because fourier domain doesnt depend on the location of the wave

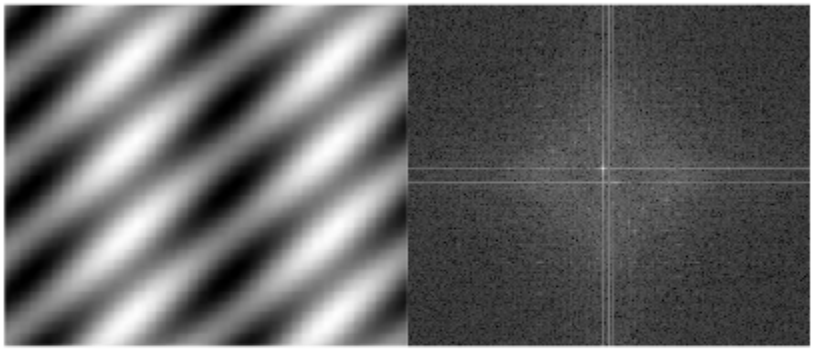
0.1.5 Img2a'

```
In [2]: img = imread('./Img2a.png');
        fourier_transform(img);
```



0.1.6 Img2b

```
In [3]: img = imread('./Img2b.png');
        fourier_transform(img);
```



0.1.7 Result

- Bluring affects both time and fourier domain

0.2 Removing salt and pepper noise using median filter

```
In [1]: img = imread('./Img3.png');
        for i = 1:3
        new_img(:,:,i) = medfilt2(img(:,:,i));
        end
        imgaussfilt(new_img,1.5);
        imshowpair(img,new_img,'montage');
```