MCBU

CSE3113/CSE3214 Introduction to Digital Image Processing

Homework 2 Report

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1. Tools

Matlab R2015a

2. Problems

Found Problems

- Salt – Pepper Noise
- Low Brightness
- Periodic Noise
- Sharpen Issue

3. Solutions

Solutions

Salt – Pepper → Medfilt2 Filter

```
a = imread('images/original.tif');
subplot(1,2,1);
imshow(a);
title('Original Picture');
I1=imread('images/7.tif');
subplot(1,2,2);
imshow(I1)
title('My Ids end = 7 ,so This is 7.tif');


I1=medfilt2(I1);%default : 3-3

figure, imshow(I1)
title('After applied median filter');
```

Low Brightness → For loop (increasing the value of pixels)

```
for i=1:375
    for j=1:500
    if f5(i,j)+90 <= 255
        f5(i,j) = f5(i,j)+90;
    elseif f5(i,j)+90 > 255
        f5(i,j) = 255;
    end
    end
end

figure, imshow(f5,[])
title('After increased brightness');
```

Periodic Noise → Notch Filter

```
%Create Notch filters corresponding to extra peaks in the Fourier transform
H1 = notch('btw', PQ(1), PQ(2), 8, 33, 14);
H2 = notch('btw', PQ(1), PQ(2), 8, 969, 738);
%It is more beautiful "btw" than "gaussian".
```

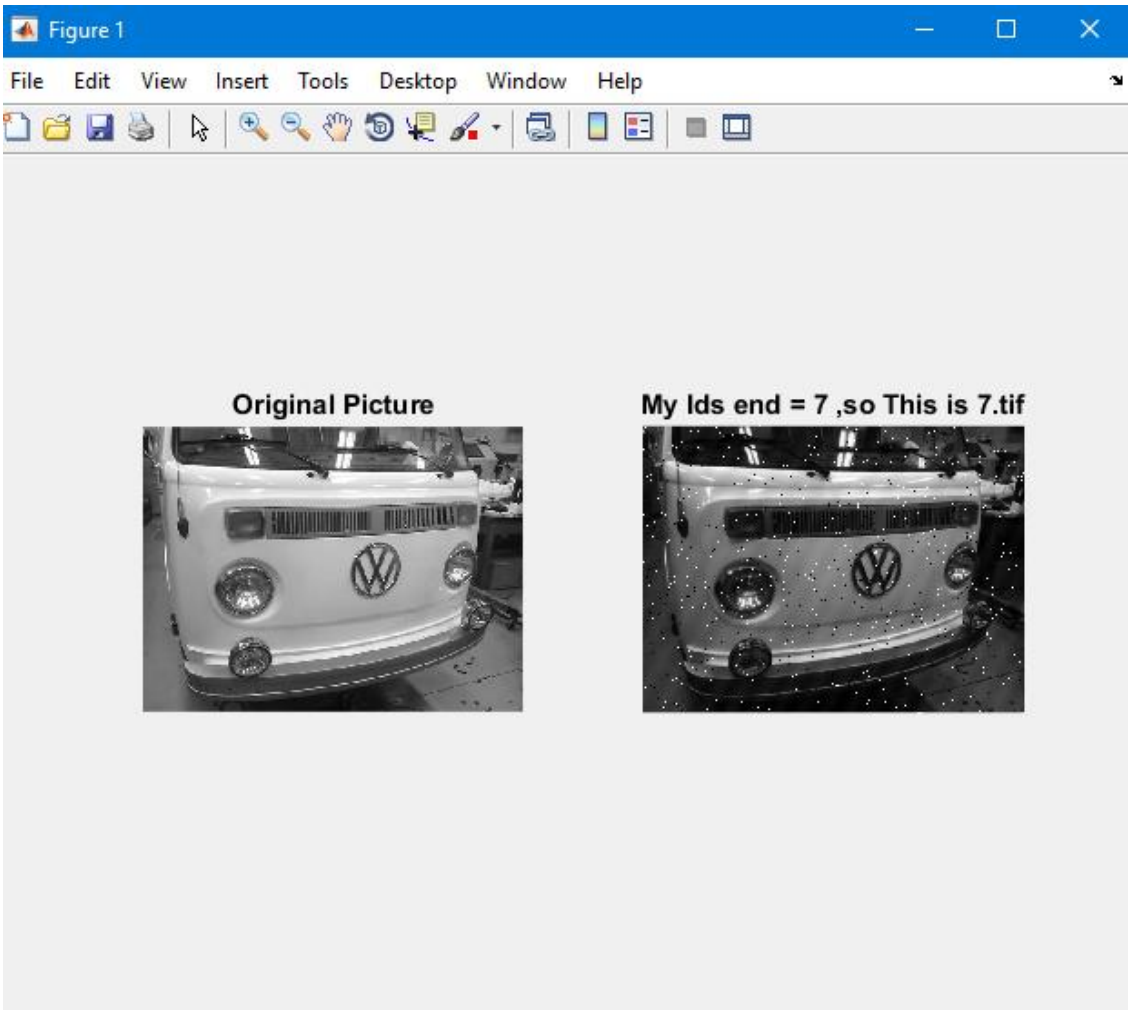
Spectrum points: (Point 1) 33, 14 – (Point2) 969, 738

Sharpen Issue → Imsharpen Filter

```
%Display the blurred image
figure, imshow(F_picture,[])
title('Blurred Image And After Applied Notch Filter');
%sharpining
Isharp1=imsharpen(F_picture);
Isharp2=imsharpen(F_picture,'Radius',2,'Amount',2);
figure, imshow(Isharp1,[])
title('After Applied Sharpening Filter');
```

4. Conclusions and Observations

Results of each steps



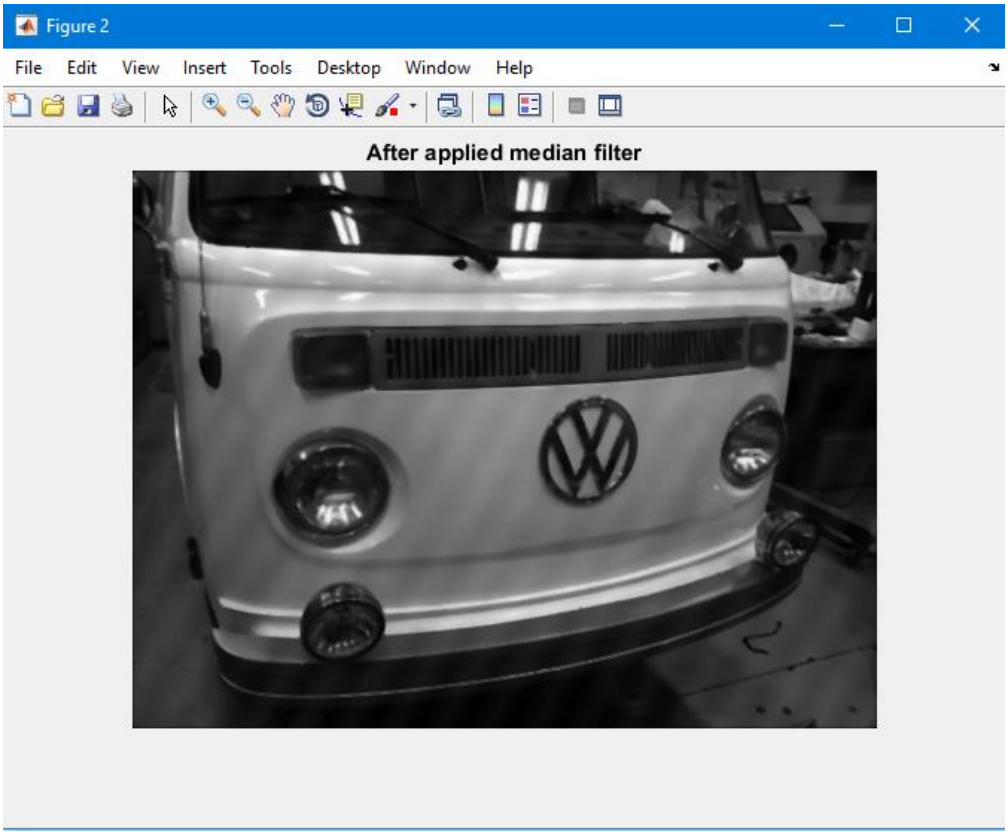


Figure 2
File Edit View Insert Tools Desktop Window Help
After applied median filter

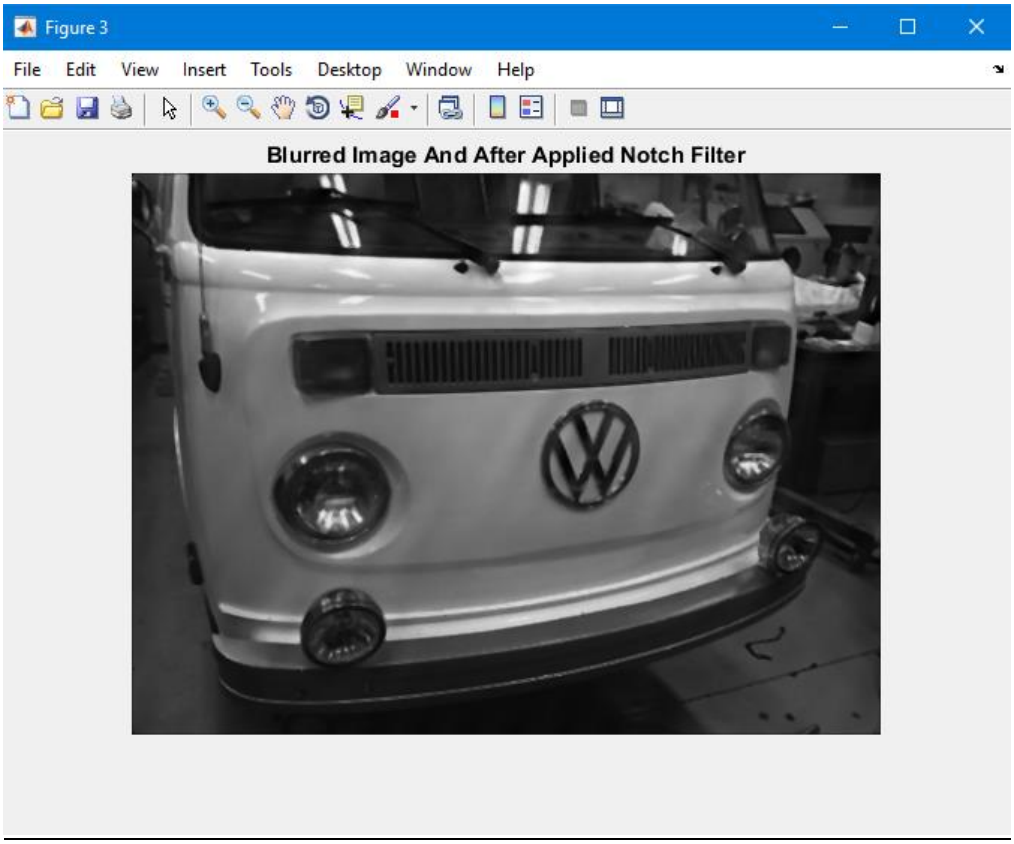
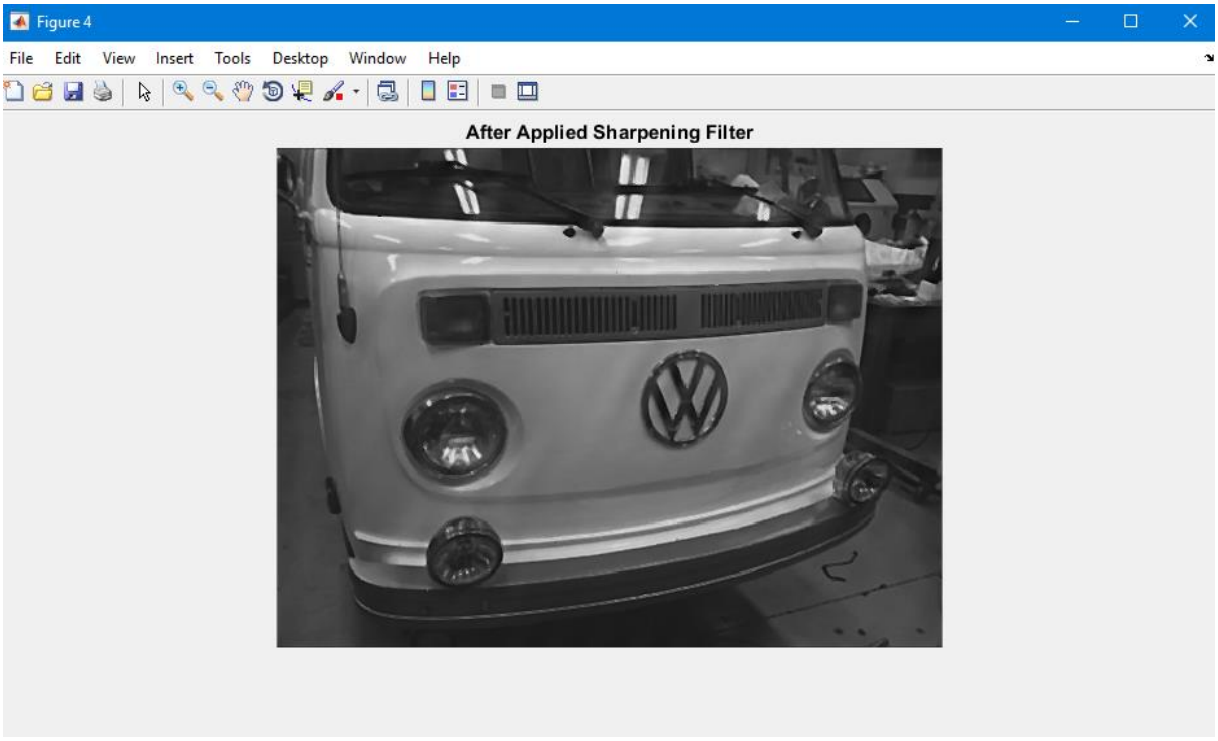
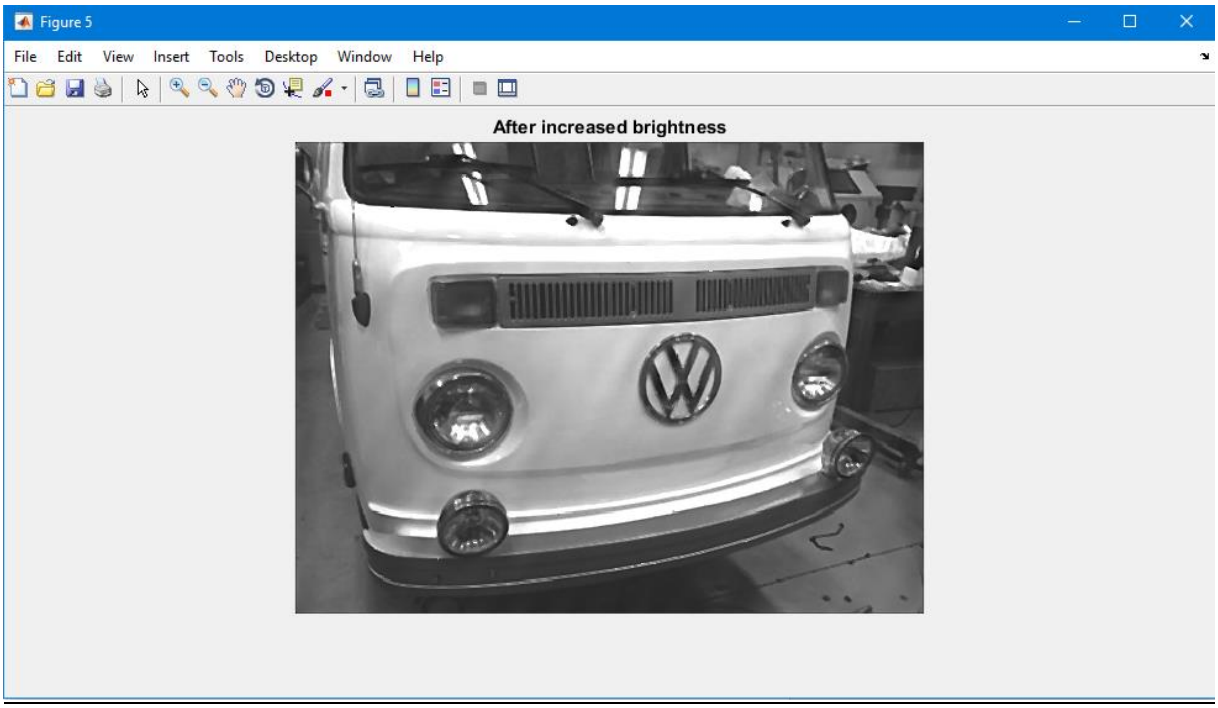


Figure 3
File Edit View Insert Tools Desktop Window Help
Blurred Image And After Applied Notch Filter





5. References

- https://www.mathworks.com/help/dsp/ref/fdesign.notch.html
- Wilhelm Burger, Mark J. Burge, “Principles of Digital Image Processing: Fundamental Techniques”
- http://www.yazilimdilleri.net/YazilimMakale-4564-Goruntu-Isleme-Matlab-ile-Resim-Parlakligini-Artirma-ve-Azaltma.aspx
- http://matlab.izmiran.ru/help/toolbox/signal/medfilt1.html