

Homework-4

Problem-1

Code

Problem-2

Compare:

Problem-3

Problem-4

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Problem-1

Code

```
% Guassian Noise
function [gaussianImg] = gauss_noise(mean, var, imshape)
    %IM_NOISE Summary of this function goes here
    % Detailed explanation goes here
    gaussianImg = sqrt(var)*randn(imshape) + mean;

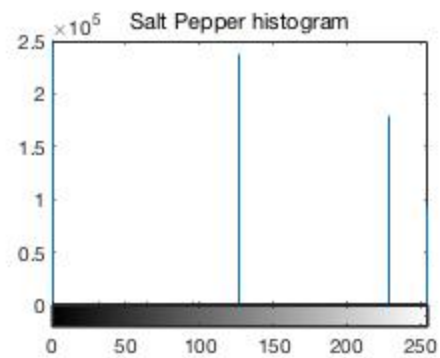
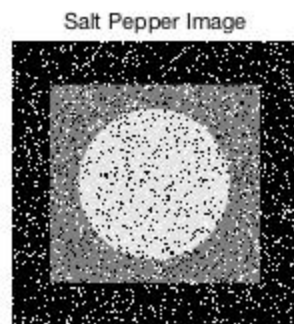
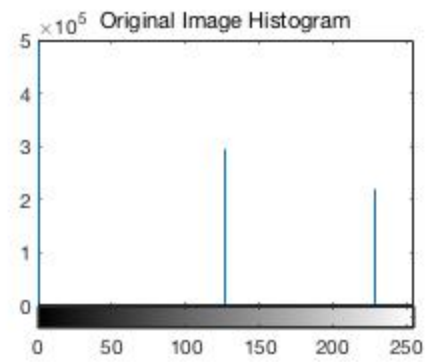
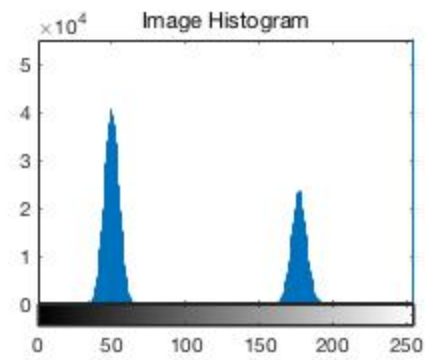
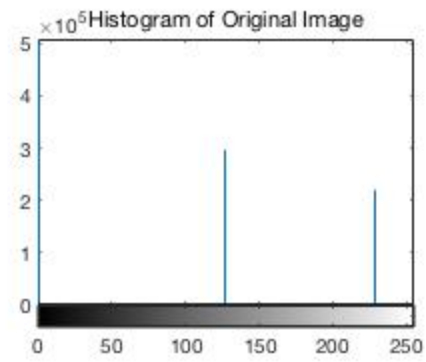
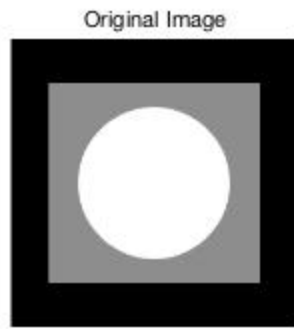
end

% Salt/Pepper Noise
function [noised_image] = salt_pepper(img, a, b, pa, pb, imshape)
    %IM_NOISE Summary of this function goes here
    % Detailed explanation goes here

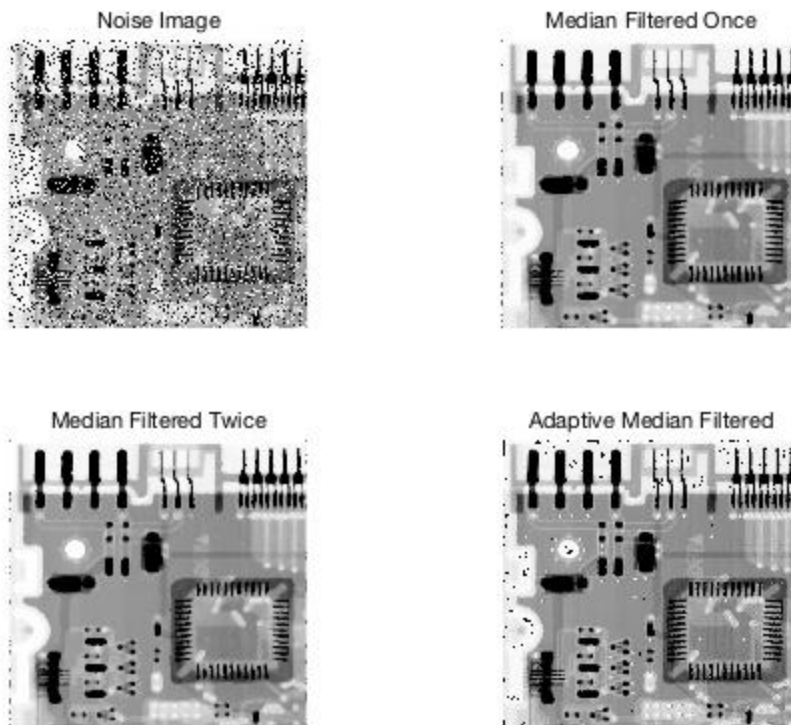
    numPixel = imshape*imshape;
    saltLoc = randperm(numPixel, round(pb*numPixel));
    pepperLoc = randperm(numPixel, round(pa*numPixel));

    img(saltLoc) = b;
    img(pepperLoc) = a;
    noised_image = img;

end
```



Problem-2

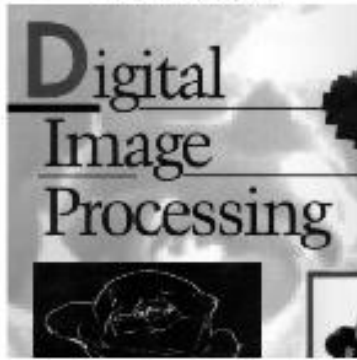


Compare:

中值滤波器能够很好的滤除“椒盐”噪声，二次滤波相比一次保留更多细节，滤去更多噪声。常规的中值滤波器相比，自适应中值滤波器能够更好的保护图像中的边缘细节部分。

Problem-3

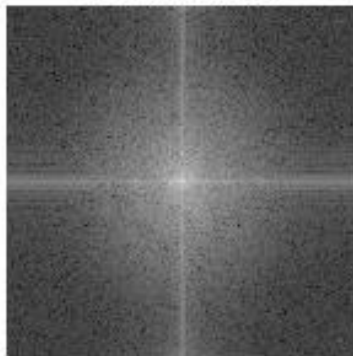
Original Image



Sinusoidal Noised Image



Spectrum image



Notch Filtered Image



Problem-4

Motion Blurred image



Guassian Noise + Motion Blurred Image



Restored Image($K=0.005$)

