《图像处理导论》

第一次作业

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作业内容：

对一张图片使用高斯噪声、椒盐噪声，和均值滤波、中值滤波进行处理。

结果展示：

代码实现：

Matlab 代码如下：

```
clear;
pic = imread('t3.jpg');
pic1 = rgb2gray(pic);
pic21 = imnoise(pic1,'gaussian',0.01,0);
%目前保持平滑性，仅增加1%扰动，第四个参数为0则不考虑平滑
pic22 = imnoise(pic21,'salt & pepper',0.08);
%第三个参数范围[0,1]，越大噪声越大
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%均值滤波的实现，也可以使用自带函数filter2(fspecial('average',n);,g)/255;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
n = 3; %模板大小
template = ones(n);
[height, width] = size(pic22);
```

```
x1 = double(pic22);
x2 = x1;
for i = 1:height-n+1
    for j = 1:width-n+1
        c = x1(i:i+n-1,j:j+n-1).*template;
        s = sum(sum(c));
        x2(i+(n-1)/2,j+(n-1)/2) = s/(n*n);
    end
end
pic23 = uint8(x2);
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%中值滤波的实现，也可以使用自带函数medfilt2(g,[n2 n2]);
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
[height, width] = size(pic23);
x3 = double(pic23);
x4 = x3;
for i = 1:height-n+1
    for j = 1:width-n+1
        c = x1(i:i+n-1,j:j+n-1);
        e = c(1,:);
        for k = 2:n
            e = [e, c(k, :)];
        end
        tmp = median(e);
        x4(i+(n-1)/2,j+(n-1)/2) = tmp;
    end
end
pic24 = uint8(x4);

figure;
subplot(2,2,1);imshow(pic21);title('1.高斯噪声(基于原图):');
subplot(2,2,2);imshow(pic22);title('2.椒盐噪声(基于图1):');
subplot(2,2,3);imshow(pic23);title('3.均值滤波(基于图2):');
subplot(2,2,4);imshow(pic24);title('4.中值滤波(基于图3):');
```