

Computer Vision HW8

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1. Write a program which does:

- (a) Generate noisy images with gaussian noise(amplitude of 10 and 30)**
- (b) Generate noisy images with salt-and-pepper noise(probability 0.1 and 0.05)**
- (c) Use the 3x3, 5x5 box filter on images generated by (a)(b)**
- (d) Use 3x3, 5x5 median filter on images generated by (a)(b)**
- (e) Use both opening-then-closing and closing-then opening filter (using the octogonal 3-5-5-5-3 kernel, value = 0) on images generated by (a)(b) You must calculate the signal-to-ratio (SNR) for each instance(4 noisy images and 24 processed images).**

1. Results.

(1). Image

1. Gaussian noise with amplitude 10



Figure 1: gaussianAmpli_10.

BoxFilter 3x3	BoxFilter 5x5
	
MedianFilter 3x3	MedianFilter 5x5
	
Opening and Closing	Closing and Opening
	

2. Gaussian noise with amplitude 30



Figure 2: gaussianAmpli_30.

BoxFilter 3x3	BoxFilter 5x5
	
MedianFilter 3x3	MedianFilter 5x5
	
Opening and Closing	Closing and Opening
	

3. Salt and Pepper noise with probability 0.05



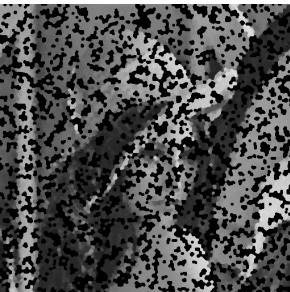
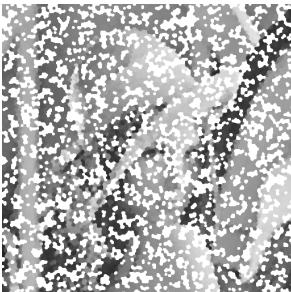
Figure 3: saltandpepperProb5.

BoxFilter 3x3	BoxFilter 5x5
	
MedianFilter 3x3	MedianFilter 5x5
	
Opening and Closing	Closing and Opening
	

4. Salt and Pepper noise with probability 0.1



Figure 4: saltandpepperProb10.

BoxFilter 3x3	BoxFilter 5x5
	
MedianFilter 3x3	MedianFilter 5x5
	
Opening and Closing	Closing and Opening
	

(2). SNR

[SNR] Gaussian noise with amplitude 10 : 13.606143338283234

[SNR] Gaussian noise with amplitude 30 : 4.1135888644802225

[SNR] Salt and Pepper noise with probability 0.05 : 0.9094299536638677

[SNR] Salt and Pepper noise with probability 0.1 : -2.113934406208579

[SNR] Gaussian noise with amplitude 10 do boxFilter 3x3 : 17.76570945093062

[SNR] Gaussian noise with amplitude 10 do boxFilter 5x5 : 14.875169574643435

[SNR] Gaussian noise with amplitude 30 do boxFilter 3x3 : 12.56971237703717

[SNR] Gaussian noise with amplitude 30 do boxFilter 5x5 : 13.294274603986116

[SNR] Salt and Pepper noise with Prob 0.05 do boxFilter 3x3 : 9.450527398245235

[SNR] Salt and Pepper noise with Prob 0.05 do boxFilter 5x5 : 11.11761662294867

[SNR] Salt and Pepper noise with Prob 0.10 do boxFilter 3x3 : 6.328101712729927

[SNR] Salt and Pepper noise with Prob 0.10 do boxFilter 5x5 : 8.504352213819718

[SNR] Gaussian noise with amplitude 10 do medianFilter 3x3 : 17.67103142205841

[SNR] Gaussian noise with amplitude 10 do medianFilter 5x5 : 15.995017936760894

[SNR] Gaussian noise with amplitude 30 do medianFilter 3x3 : 11.102134472662781

[SNR] Gaussian noise with amplitude 30 do medianFilter 5x5 : 12.911778345718295

[SNR] Salt and Pepper noise with Prob 0.05 do medianFilter 3x3 : 19.165121046919225

[SNR] Salt and Pepper noise with Prob 0.05 do medianFilter 5x5 : 16.35318950805513

[SNR] Salt and Pepper noise with Prob 0.10 do medianFilter 3x3 : 14.978079884625357

[SNR] Salt and Pepper noise with Prob 0.10 do medianFilter 5x5 : 15.769234415883622

[SNR] Gaussian noise with amplitude 10 do Opening and Closing : 13.25174460213125

[SNR] Gaussian noise with amplitude 10 do Closing and Opening : 13.5912351933727

[SNR] Gaussian noise with amplitude 30 do Opening and Closing : 11.207026739568981

[SNR] Gaussian noise with amplitude 30 do Closing and Opening : 11.128473071856854

[SNR] Salt and Pepper noise with Prob 0.05 do Opening and Closing : 5.689275520033768

[SNR] Salt and Pepper noise with Prob 0.05 do Closing and Opening : 4.806542589695915

[SNR] Salt and Pepper noise with Prob 0.10 do Opening and Closing : -2.2406435671053266

[SNR] Salt and Pepper noise with Prob 0.10 do Closing and Opening : -2.526016459746872