

Computer Vision HW8, Noise Removal Report

tags: NTU CS Computer Vision Writeup Report

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Prerequisites and env as the following

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Ubuntu WSL for windows with jupyter notebook  
Python3.6.7  
OpenCV for image IO  
Matplotlib for displaying image
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a, Generate noisy images with gaussian noise(amplitude of 10 and 30)



SNR of image gn_10 is 12.489506



SNR of image gn_30 is 4.984327

b, Generate noisy images with salt-and-pepper noise(probability 0.1 and 0.05)



SNR of image gsp_05 is 1.868454



SNR of image gsp_10 is -1.037364

c, Use the 3x3, 5x5 box filter on images generated by (a)(b)



SNR of image problem_c/lena_gn_10_box_3.png is 11.137551



SNR of image problem_c/lena_gn_10_box_5.png is 11.237070



SNR of image problem_c/lena_gn_30_box_3.png is 9.424313



SNR of image problem_c/lena_gn_30_box_5.png is 10.545494



SNR of image problem_c/lena_gsp_05_box_3.png is 7.630154



SNR of image problem_c/lena_gsp_05_box_5.png is 9.303153



SNR of image problem_c/lena_gsp_10_box_3.png is 5.516857



SNR of image problem_c/lena_gsp_10_box_5.png is 7.465335

d, Use 3x3, 5x5 median filter on images generated by (a)(b)



SNR of image problem_d/lena_gn_10_med_3.png is 11.270961



SNR of image problem_d/lena_gn_10_med_5.png is 11.562366



SNR of image problem_d/lena_gn_30_med_3.png is 8.503938



SNR of image problem_d/lena_gn_30_med_5.png is 10.746141



SNR of image problem_d/lena_gsp_05_med_3.png is 10.909508



SNR of image problem_d/lena_gsp_05_med_5.png is 11.036893



SNR of image problem_d/lena_gsp_10_med_3.png is 10.121708

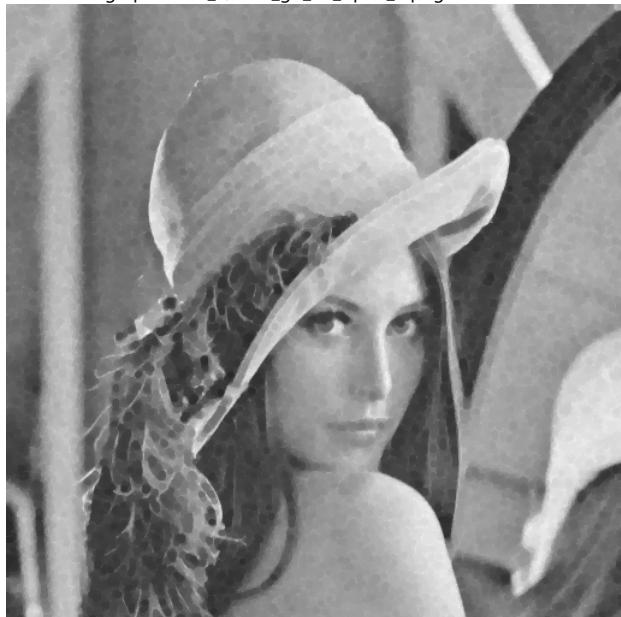


SNR of image problem_d/lena_gsp_10_med_5.png is 10.855369

e, Use both opening-then-closing and closing-then opening filter (using the octagonal 3-5-5-5-3 kernel, value = 0) on images generated by (a)(b)



SNR of image problem_e/lena_gn_10_open_5.png is 13.657049



SNR of image problem_e/lena_gn_10_clos_5.png is 14.962286



SNR of image problem_e/lena_gn_30_open_5.png is 10.045584



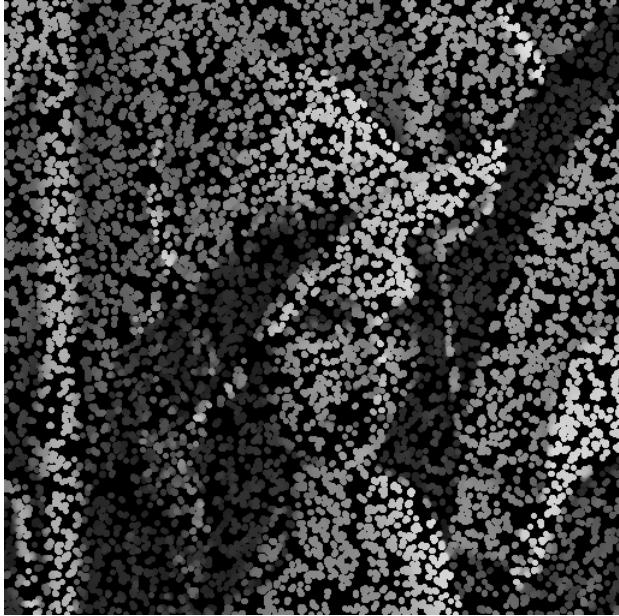
SNR of image problem_e/lena_gn_30_clos_5.png is 10.250701



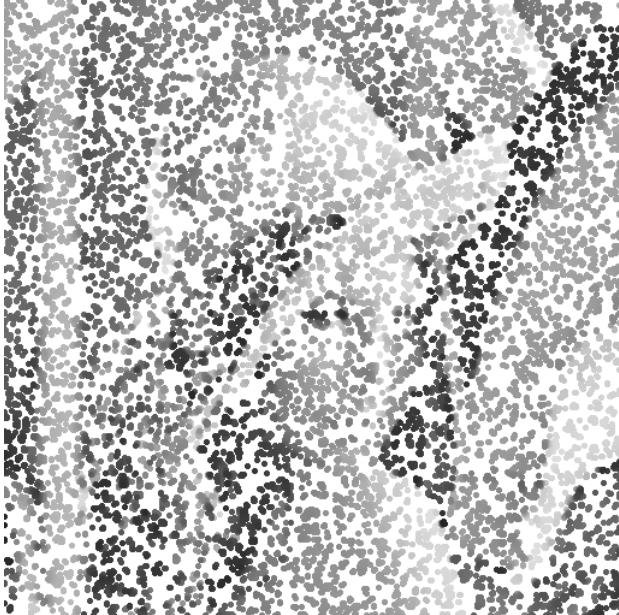
SNR of image problem_e/lena_gsp_05_open_5.png is 0.269108



SNR of image problem_e/lena_gsp_05_clos_5.png is -0.203085



SNR of image problem_e/lena_gsp_10_open_5.png is -2.685338



SNR of image problem_e/lena_gsp_10_clos_5.png is -3.204578