Computer Vision
Home Work 8

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Project – Noise Removal.

Language and library used: Python, Pillow, Numpy, OpenCV.

Original Image

Gaussian Noise

Amplitude =10 Median Filter 3*3

Amplitude = 10 Median Filter 5*5

Amplitude = 30 Median filter 3*3

Amplitude = 30 Median filter 5*5

Amplitude 10 (No Filter)

Amplitude = 10 Opening and Closing

Amplitude = 30 Opening and closing

Amplitude = 10 Closing and Opening

Amplitude=30 Closing and Opening

Amplitude=30 Box Filter = 0.5

Amplitude = 10 Box Filter = 0.5

Amplitude = 30 Box Filter =0.3

Amplitude = 10 Box Filter 0.3

Amplitude = 30

Salt and Pepper

Probability = 0.1

Probability = 0.05

Probability=0.1 Close and Open

Probability = 0.1 Open and Close

Probability=0.5 Close and Open

Probability = 0.5 Median Filter 3*3

Probability = 0.5 Median Filter 5*5

Probability = 0.5 Opening and Closing

Probability = 10 Median Filter = 3*3

Probability = 10 Median Filter = 5*5

Probability = 0.1 Box Filter = 0.5

Probability = 0.1 Box Filter 0.3

Probability = 0.5 Box Filter = 0.5

Probability = 0.1 Box Filter = 0.3

Signal to Noise Ratio

gaussianNoise_10_SNR: 13.56472572763004
gaussianNoise_30_SNR: 2.855710211625561
saltAndPepper_0_01_SNR: -2.0692220349467356
saltAndPepper_0_05_SNR: 0.8946181758374777
gaussianNoise_10_box_3x3_SNR: 11.945595165008083
gaussianNoise_30_box_3x3_SNR: 9.105011019172704
saltAndPepper_0_01_box_3x3_SNR: 5.7170171766633535
saltAndPepper_0_05_box_3x3_SNR: 8.06888513213883
gaussianNoise_10_box_5x5_SNR: 8.770590583732563
gaussianNoise_30_box_5x5_SNR: 8.770590583732563
saltAndPepper_0_01_box_5x5_SNR: 6.612741837558412
saltAndPepper_0_05_box_5x5_SNR: 7.780470930040363
gaussianNoise_10_median_3x3_SNR: 11.364133042804124
gaussianNoise_30_median_3x3_SNR: 8.93732310574696
saltAndPepper_0_01_median_3x3_SNR: 10.545323853402879
saltAndPepper_0_05_median_3x3_SNR: 11.529784457382487
gaussianNoise_10_median_5x5_SNR: 8.217005502424739
gaussianNoise_30_median_5x5_SNR: 7.96552096230371
saltAndPepper_0_01_median_5x5_SNR: 8.070445225896359
saltAndPepper_0_05_median_5x5_SNR: 8.108491398465018
gaussianNoise_10_openingThenClosing_SNR: 4.667682741102726
gaussianNoise_30_openingThenClosing_SNR: 4.362648856902253
saltAndPepper_0_01_openingThenClosing_SNR: 2.9001756300225914
saltAndPepper_0_05_openingThenClosing_SNR: 3.7148050492782754
gaussianNoise_10_closingThenOpening_SNR: 5.008969164812753

gaussianNoise_30_closingThenOpening_SNR: 4.226989722495777
saltAndPepper_0_01_closingThenOpening_SNR: 3.548940585879159
saltAndPepper_0_05_closingThenOpening_SNR: 4.316030140089023