Assignment 1: CS 663, Fall 2024

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Q7) Report

We are given the barbara256 file. After applying the $\sigma = 5$ and $\sigma = 10$ noises to the image, we get barbara256_noisy_5 and barbara256_noisy_10 respectively.

barbara256

barbara256_noisy_5

barbara256_noisy_10

barbara256_filtered_5_1

barbara256_filtered_5_2

barbara256_filtered_5_3

On using the Bilateral Filter on barbara256_noisy_5 with $(\sigma_s = 2, \sigma_r = 2), (\sigma_s = 0.1, \sigma_r = 0.1), (\sigma_s = 3, \sigma_r = 15)$, we get barbara256_filtered_5_1, barbara256_filtered_5_2 and barbara256_filtered_5_3 respectively. We see that the noise is significantly removed in the barbara256_filtered_5_3 case, while the other two images appear quite noisy.

barbara256_filtered_10_1

barbara256_filtered_10_2

barbara256_filtered_10_3

On using the Bilateral Filter on barbara256_noisy_10 with $(\sigma_s = 2, \sigma_r = 2), (\sigma_s = 0.1, \sigma_r = 0.1), (\sigma_s = 3, \sigma_r = 15)$, we get barbara256_filtered_10_1, barbara256_filtered_10_2 and barbara256_filtered_10_3 respectively. We see that the noise is significantly removed in the barbara256_filtered_10_3 case, while the other two images appear quite noisy.

We are also given the kodak24 file. After applying the $\sigma = 5$ and $\sigma = 10$ noises to the image, we get kodak24_noisy_5 and kodak24_noisy_10 respectively.

kodak24

kodak24_noisy_5

kodak24_noisy_10

kodak24_filtered_5_1

barbara256_filtered_5_2

barbara256_filtered_5_3

On using the Bilateral Filter on kodak24_noisy_5 with $(\sigma_s = 2, \sigma_r = 2), (\sigma_s = 0.1, \sigma_r = 0.1), (\sigma_s = 3, \sigma_r = 15)$, we get kodak24_filtered_5_1, kodak24_filtered_5_2 and kodak24_filtered_5_3 respectively. We see that the noise is significantly removed in the kodak24_filtered_5_3 case, while the other two images appear quite noisy, similar to what was observed in the barbara256 case.

kodak24_filtered_10_1

kodak24_filtered_10_2

kodak24_filtered_10_3

On using the Bilateral Filter on kodak24_noisy_10 with $(\sigma_s = 2, \sigma_r = 2), (\sigma_s = 0.1, \sigma_r = 0.1), (\sigma_s = 3, \sigma_r = 15)$, we get kodak24_filtered_10_1, kodak24_filtered_10_2 and kodak24_filtered_10_3 respectively. We see that the noise is significantly removed in the kodak24_filtered_10_3 case, while the other two images appear quite noisy, similar to what was observed in the barbara256 case.