CS663: Fundamentals of Digital Image Processing
Homework 2

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Question 8

Conclusions

- Increasing σ_s reduces noise in the image but blurs out the edges, this is because the increased standard deviation smoothen outs a larger area surrounding a pixel
- Increasing σ_r leads to blurring of the wider features but sharpens the edges
- Increasing *sigma* for the added White Gaussian noise results in reducing the filters ability to preserve the edges and fine details and thereby causes more blurring in broader regions.

Images

Figure 1: Barbara with $\sigma_{noise} = 5$

Figure 2: $\sigma_{noise} = 5, \sigma_s = 2, \sigma_r = 2$

Figure 3: $\sigma_{noise} = 5, \sigma_s = 0.1, \sigma_r = 0.1$

Figure 4: $\sigma_{noise} = 5, \sigma_s = 3, \sigma_r = 15$

Figure 5: Barbara with $\sigma_{noise} = 10$

Figure 6: $\sigma_{noise} = 10, \sigma_s = 2, \sigma_r = 2$

Figure 7: $\sigma_{noise} = 10, \sigma_s = 0.1, \sigma_r = 0.1$

Figure 8: $\sigma_{noise} = 10, \sigma_s = 3, \sigma_r = 15$

Figure 9: Kodak with $\sigma_{noise} = 5$

Figure 10: $\sigma_{noise} = 5, \sigma_s = 2, \sigma_r = 2$

Figure 11: $\sigma_{noise} = 5, \sigma_s = 0.1, \sigma_r = 0.1$

Figure 12: $\sigma_{noise} = 5, \sigma_s = 3, \sigma_r = 15$

Figure 13: Kodak with $\sigma_{noise} = 10$

Figure 14: $\sigma_{noise} = 10, \sigma_s = 2, \sigma_r = 2$

Figure 15: $\sigma_{noise} = 10, \sigma_s = 0.1, \sigma_r = 0.1$

Figure 16: $\sigma_{noise} = 10, \sigma_s = 3, \sigma_r = 15$