



Bilateral Filtering

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(Final Project)



OUTLINE



Introduction



Method



Experiments/Results



Conclusion

INTRODUCTION

A noise-reducing smoothing filter. It replaces the intensity of each pixel with a weighted average of intensity values of nearby pixels. The weights are based on a Gaussian model.

Weights are calculated using both Euclidian distance and radiometric differences.

METHOD

$$I^{\text{filtered}}(x) = \frac{1}{W_p} \sum_{x_i \in \Omega} I(x_i) f_r(\|I(x_i) - I(x)\|) g_s(\|x_i - x\|), \quad (1)$$

$$W_p = \sum_{x_i \in \Omega} f_r(\|I(x_i) - I(x)\|) g_s(\|x_i - x\|) \quad (1a)$$

$$g(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2} \quad (2)$$

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EXPERIMENTS



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LIMITATIONS

- Time
- Lots of inputs
- Image quality
- Large mask creates margins

CONCLUSION

