

NeRF as a Denoiser

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Motivation

- Traditional Denoising techniques usually use information from a single image.
- Burst denoising can create a clean image by aligning and merging a burst of underexposed photos
- The Neural Radiance Field (NeRF) is a technique for novel view synthesis. It requires 25-100 images as inputs.
- Like Burst denoising, NeRF could potentially serve as a denoise tool, as it integrates information from many input images.

Related Work

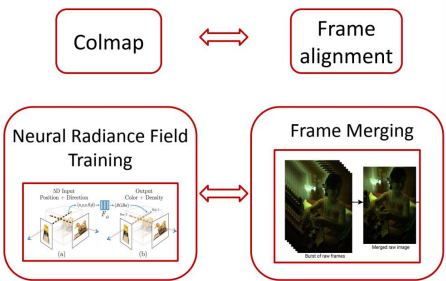
RawNeRF [1]

- This paper shows NeRF is robust to the zero-mean distribution of raw noise.
- The post-processing pipeline in the camera will distort the noise distribution.
- Training NeRF directly on linear Raw data will produce better denoising results.

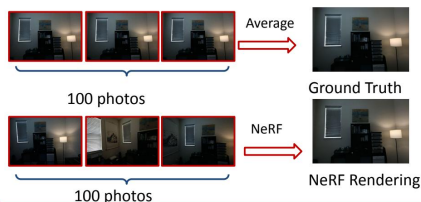
Reference

[1] Mildenhall, Ben, et al. "Nerf in the dark: High dynamic range view synthesis from noisy raw images." Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2022.

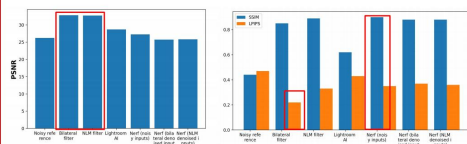
NeRF vs Burst denoising



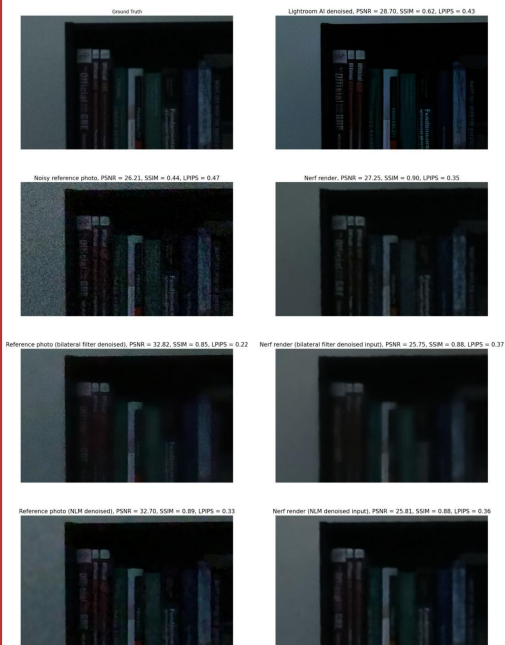
Dataset



Experimental Results



Experimental Results



Based on our results:

- Traditional denoising techniques perform better in PSNR and LPIPS
- NeRF outperforms visually and in SSIM
- NeRF performs comparably with other AI denoising techniques