

RFFNet: Towards Robust and Flexible Fusion for Low-Light Image Denoising

Supplementary Material

1 MORE QUANTITATIVE EXPERIMENTS

To further demonstrate the effectiveness of our approach in extremely low-light environments, we evaluate our RFFNet on the DVD [7] test set under Gaussian-Poisson mixed noise with $\sigma=8$ and the FAID [1] test set under Gaussian noise with $\sigma=100$. We compare our results with state-of-the-art guided image denoising approaches, including DKN [8], SVLRM [10], CUNet [6], SANet [11], DVN [7], DeepFnF [12] and RIDFnF [9]. Additionally, we also consider single-image denoising methods, such as RIDNet [2], SADNet [3], NBNNet [5], MPRNet [14], Restormer [13], and NAFNet [4]. All compared methods are trained on the same training set as ours. Tab. 1 shows that our method achieves the best results.

Table 1: The average PSNR, SSIM, and LPIPS on the DVD [7] test set with noise level $\sigma=8$ and FAID [1] test set with noise level $\sigma=1000$. The best results are highlighted in boldface.

Methods	DVD ($\sigma=8$)			FAID ($\sigma=100$)		
	PSNR \uparrow	SSIM \uparrow	LPIPS \downarrow	PSNR \uparrow	SSIM \uparrow	LPIPS \downarrow
RIDNet [2]	24.23	0.855	0.162	28.83	0.879	0.400
SADNet [3]	25.14	0.880	0.149	30.84	0.920	0.389
NBNNet [5]	24.81	0.882	0.147	30.08	0.918	0.395
MPRNet [14]	26.20	0.891	0.141	31.28	0.923	0.387
Restormer [13]	25.65	0.890	0.139	31.37	0.923	0.381
NAFNet [4]	25.23	0.886	0.138	31.54	0.926	0.367
DKN [8]	22.50	0.780	0.170	29.54	0.910	0.354
SVLRM [10]	21.27	0.971	0.164	30.03	0.915	0.350
CUNet [6]	24.49	0.850	0.147	31.49	0.935	0.314
SANet [11]	24.63	0.885	0.120	31.83	0.937	0.306
DVN [7]	26.98	0.915	0.109	-	-	-
DeepFnF [12]	-	-	-	32.92	0.949	0.285
RIDFnF [9]	-	-	-	32.97	0.950	0.285
RFFNet	27.13	0.924	0.099	33.72	0.955	0.282

2 MORE VISUAL RESULTS

In this section, we provide more qualitative comparisons for the two tasks: NIR-guided RGB image denoising (Fig. 1-Fig. 4), and flash-guided no-flash image denoising (Fig. 5-Fig. 8). In comparison, our RFFNet can not only effectively restore more salient structures and richer details, but also stably suppress the artifacts caused by inconsistency.

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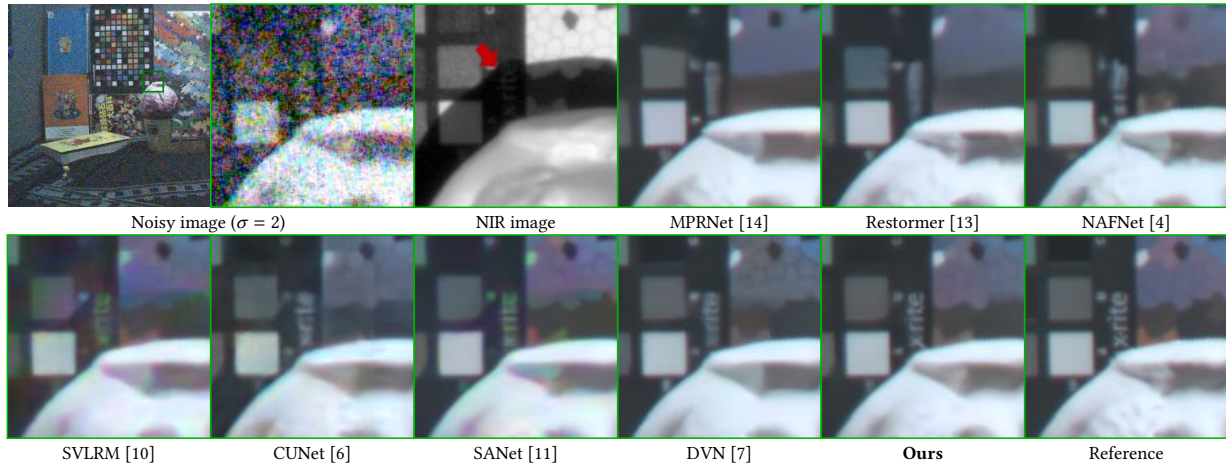


Figure 1: The qualitative comparisons for NIR-guided RGB image denoising on DVD [7] with $\sigma = 2$.

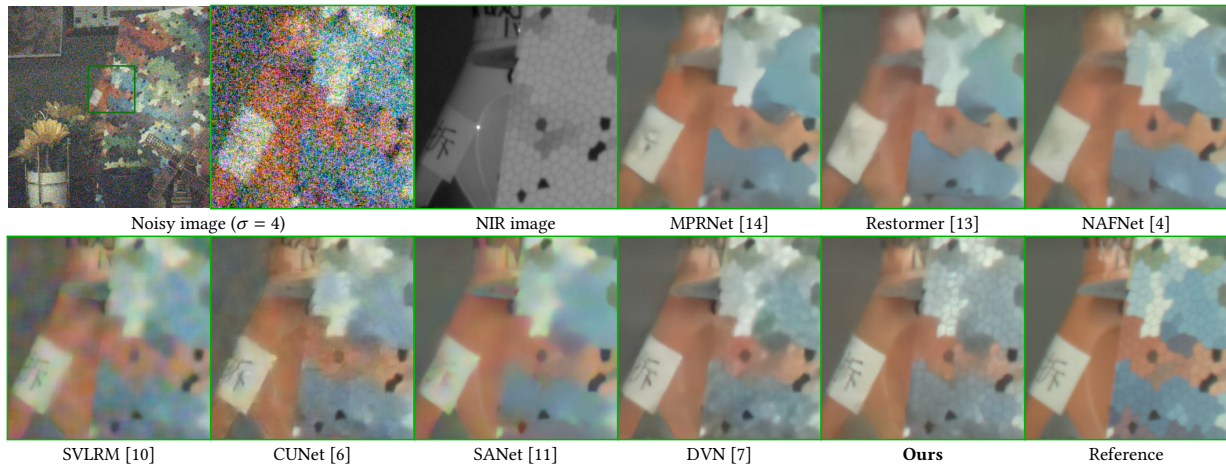


Figure 2: The qualitative comparisons for NIR-guided RGB image denoising on DVD [7] with $\sigma = 4$.

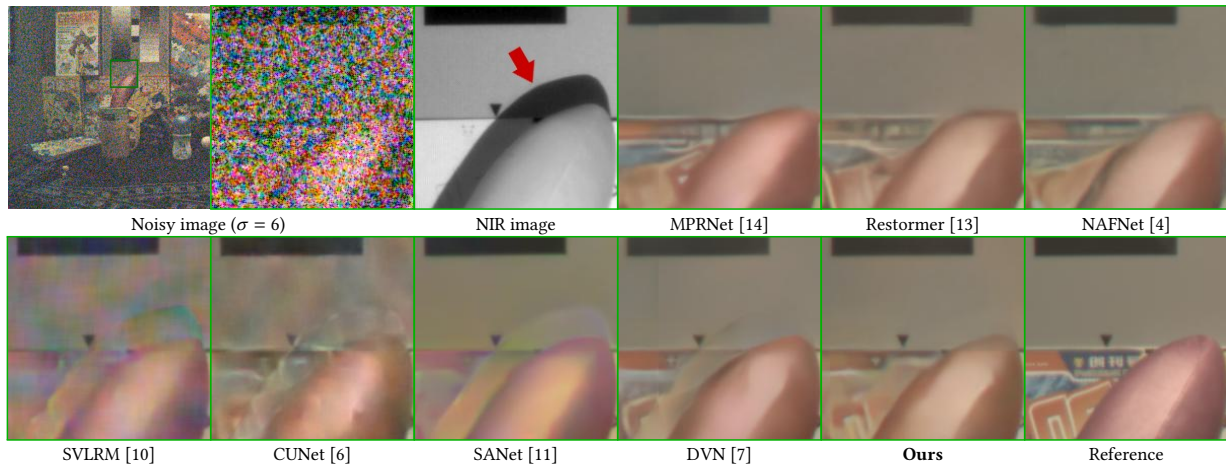


Figure 3: The qualitative comparisons for NIR-guided RGB image denoising on DVD [7] with $\sigma = 6$.



Figure 4: The qualitative comparisons for NIR-guided RGB image denoising on DVD [7] with $\sigma = 8$.

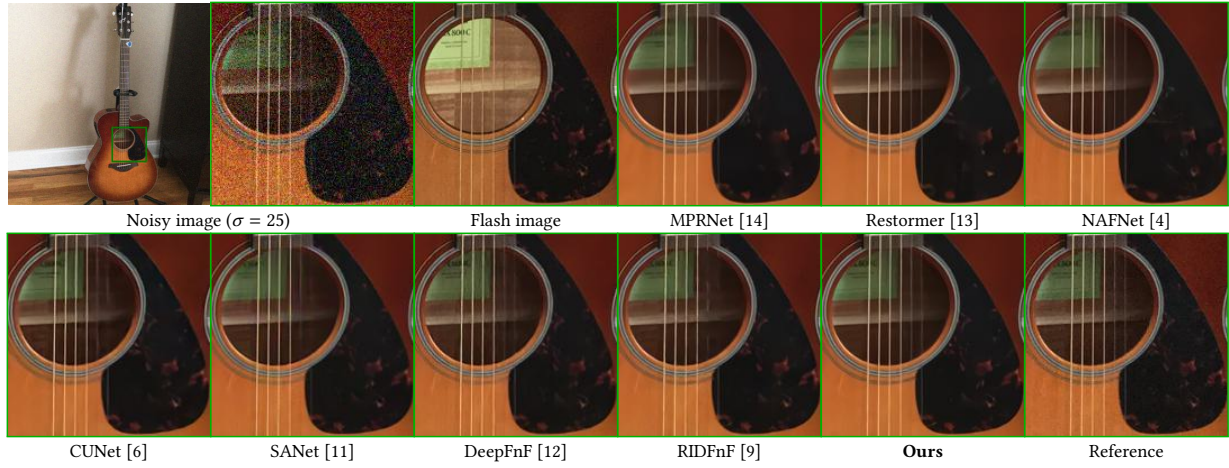


Figure 5: The qualitative comparisons for flash-guided no-flash image denoising on FAID [1] with $\sigma = 25$.

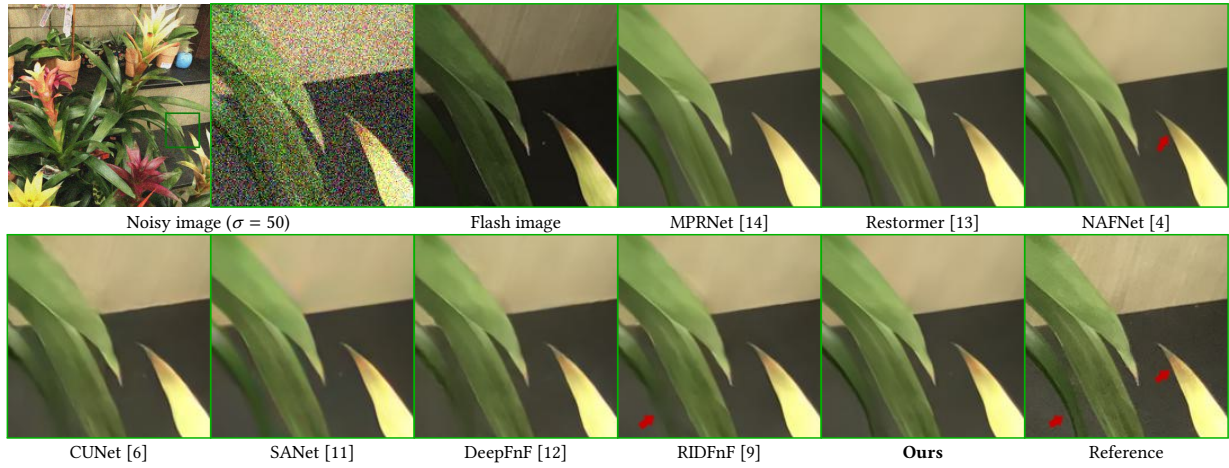


Figure 6: The qualitative comparisons for flash-guided no-flash image denoising on FAID [1] with $\sigma = 50$.

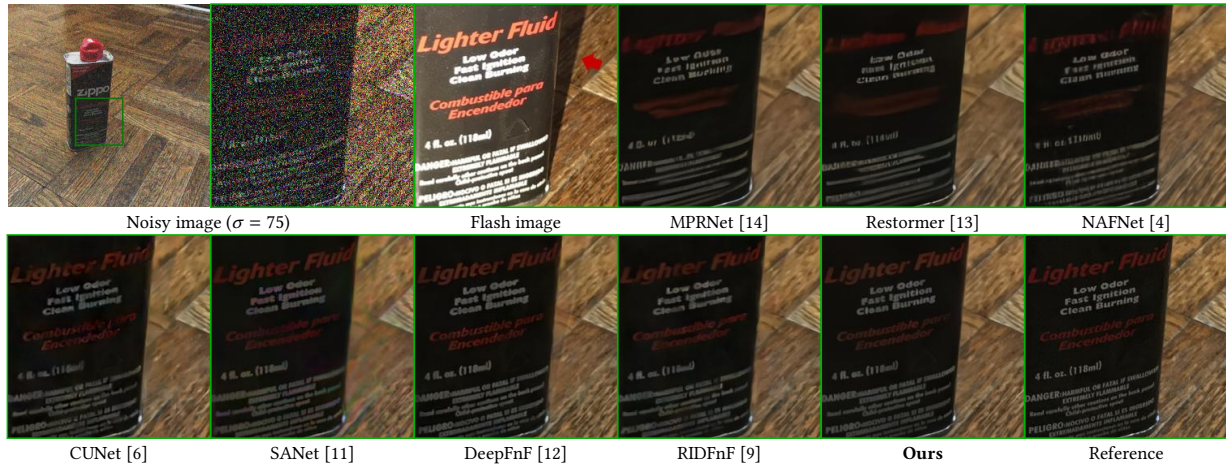


Figure 7: The qualitative comparisons for flash-guided no-flash image denoising on FAID [1] with $\sigma = 75$.

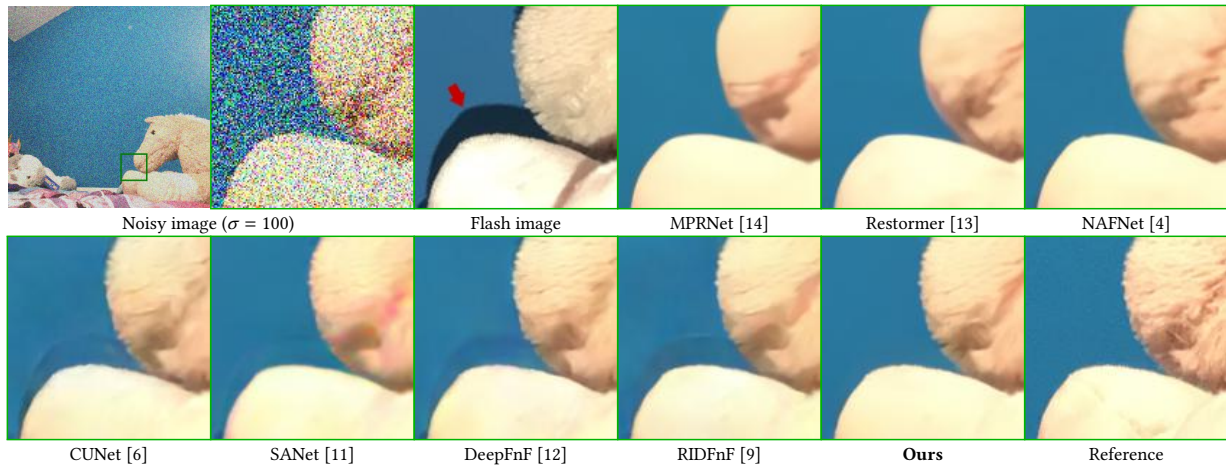


Figure 8: The qualitative comparisons for flash-guided no-flash image denoising on FAID [1] with $\sigma = 100$.