Retinex-MEF: Retinex-based Glare Effects Aware Unsupervised Multi-Exposure Image Fusion

SUPPLEMENTARY MATERIALS

Abstract

In this document, we provide additional supplementary information for the paper "Retinex-MEF: Retinex-based Glare Effects Aware Unsupervised Multi-Exposure Image Fusion". This file contains:
(I) Additional fusion comparison visualization results of Underexposure-Overexposure Fusion in Sec. 4.2 of the main paper.
(II) More exposure control visualization results corresponding to Sec. 4.3 of the main paper.
(III) Additional visualization results under dual extreme exposure, corresponding to Sec . 4.4 of the main paper.
(IV) Further visualization results of Retinex decomposition for fusion, corresponding to Sec. 4.5 of the main paper.
(V) Further visualization results of Ablation Study, corresponding to Sec. 4.6 of the main paper.

1. Additional fusion results

In this section, we provide additional qualitative comparisons of fusion results, as presented in Fig. S-1.

2. Additional Exposure Control Results

This section presents additional results on exposure control. Fig. S-2 shows images with E from 0.1 to 0.9, demonstrating gradual enhancement without artifacts.

3. Additional Results of Homogeneous Extreme Exposure Fusion

This section presents additional results on homogeneous extreme exposure fusion, further demonstrating the robustness of our method in handling overexposed and underexposed scenes. Fig. S-3 shows fusion results under homogeneous extreme exposures, where our method retains highlights in bright regions and enhances visibility in dark areas without introducing artifacts.

4. Additional Retinex Decomposition Results

This section presents additional results on Retinex decomposition, further validating its effectiveness in multi-exposure fusion. Fig. S-4 shows decomposition results, where our approach preserves textures, removes glare, and maintains structural details, surpassing direct pixel fusion methods.

5. Additional Results of Ablation Study

This section presents additional results from the ablation experiments, offering a deeper insight into the impact of various components on the overall performance of our model. It aims to elucidate the contributions of individual elements by illustrating how their removal or modification affects the outcomes. Further comparative visualizations of various ablation experiments are illustrated in Fig. S-5.

Figure S-1. Visual comparison of fused images across different methods. The cases are "SevenElevenNight" in MEFB dataset, "59" in SICE dataset.

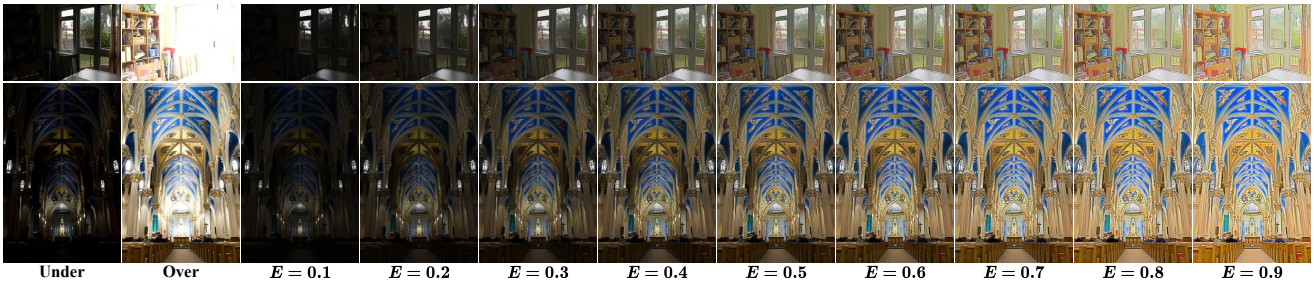

Figure S-2. Smooth adjustment of exposure level and preservation of visual quality. The cases are "House" and "Church" in MEFB dataset.

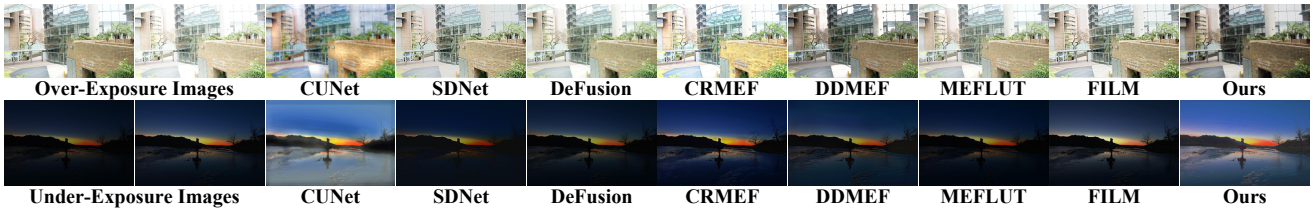

Figure S-3. Visual comparison of methods in homogeneous extreme exposure scenarios. The top and bottom rows correspond to both overexposure and underexposure inputs, respectively. The cases are "176" in and "10" in SICE dataset.

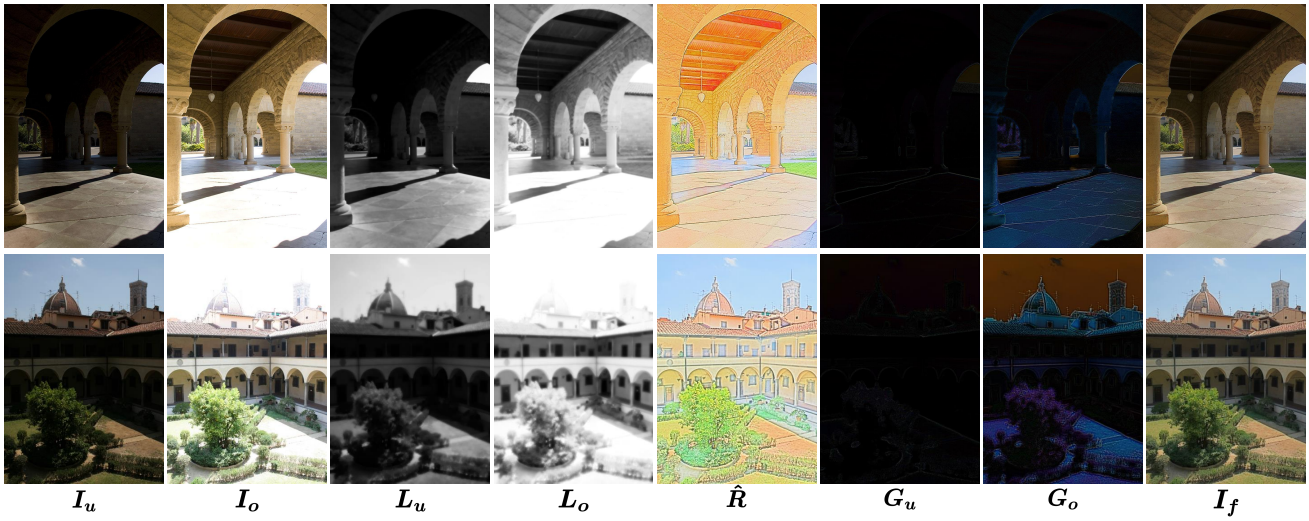

Figure S-4. Visualization of the Retinex decomposition results. The cases are "ArchSequence" and "Laurenziana" in MEFB dataset.

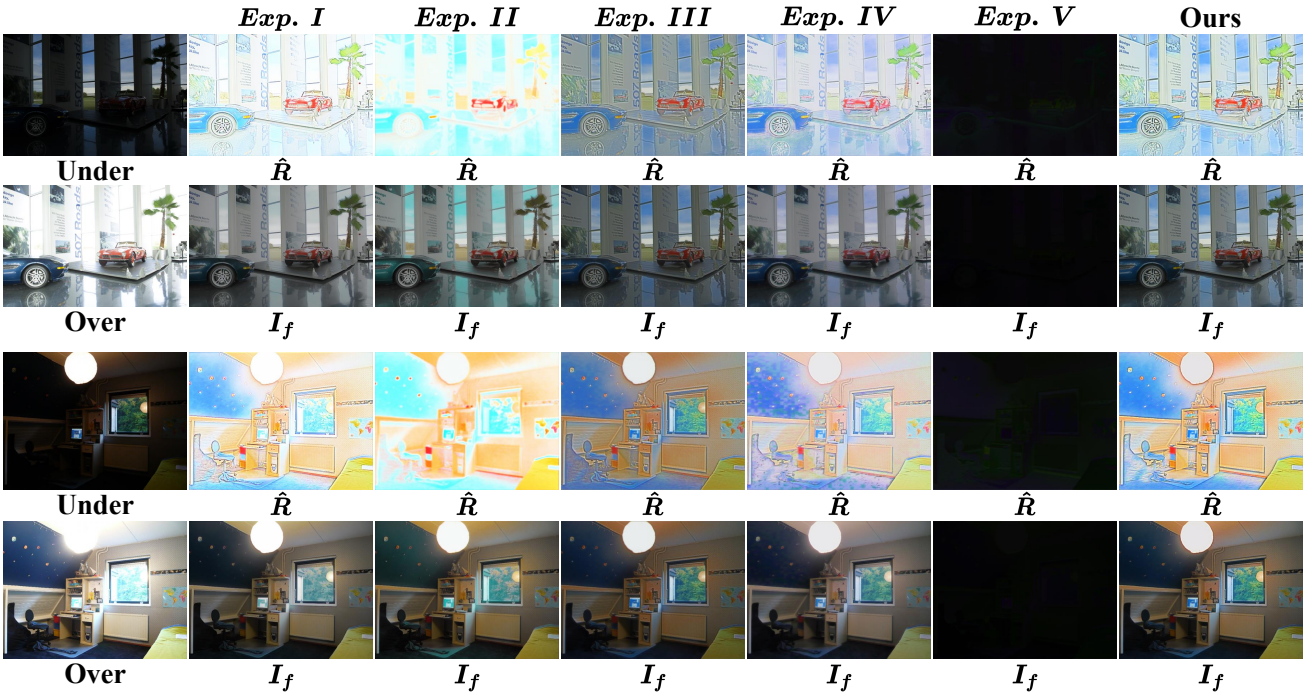

Figure S-5. Additional visualization of ablation experiment results. The cases are “507” and ”Window” in MEFB dataset.