NTIRE 2025 Efficient Burst HDR and Restoration
A Hierarchical Fourier-based Transformer for Burst HDR and Restoration

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1. Team Details

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Username: accept
File Name: c256.zip
PSNR: 40.64
Best Score: SFHformer2_ft6_5e-6_batch2_4000.zip (03/12/2025 12:10:26) PSNR: 41.73(development phase)
Code Link: https://github.com/Levi202309/NTIRE-2025-Burst

2. Method Details

Our proposed model utilizes the SFHFormer [1] block, which consists of a hierarchical encoder-decoder structure composed of five stages. The structure includes a two-scale encoder (stage-1 and stage-2), a bottleneck (stage-3), and a two-scale decoder (stage-4 and stage-5). The core components of our SFHFormer block are: (a) Local Global Perception Mixer (LGPM) and (b) Multi-kernel ConvFFN (MCFN). The LGPM is designed to capture both local and global feature representations, while the MCFN enhances the feature transformation capabilities through multiple kernel convolutions.

2.1. figure of the model

See the figure on the right.

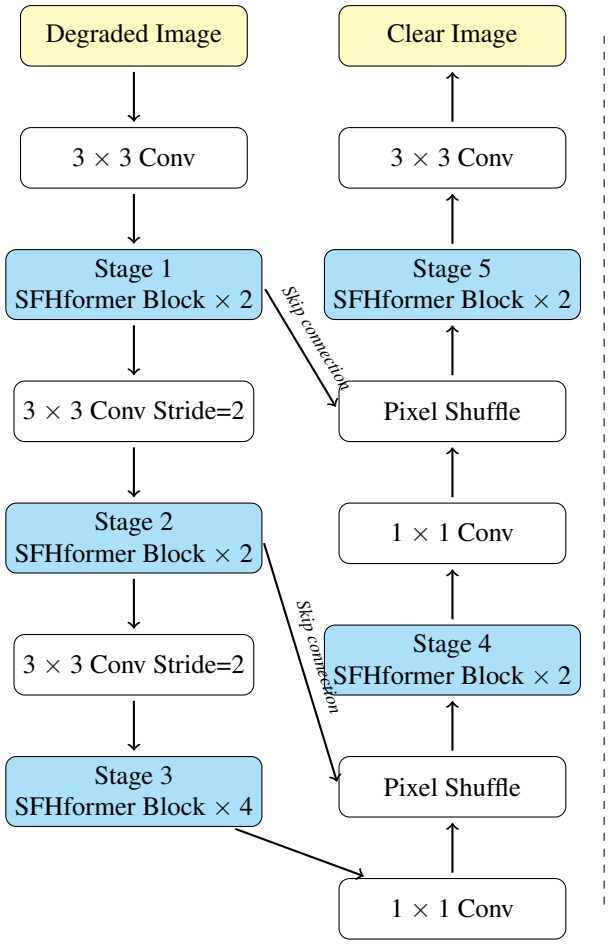

Figure 1. Model Architecture

2.2. Training Strategy

AdamW optimizer with β_1 and β_2 equal to 0.9 and 0.999 is used to train SFHformer. The initial learning rate is set as 7.5×10^{-4}. We adopt the cosine annealing strategy to train the models, where the learning rate gradually decreases from the initial learning rate to 5×10^{-6}. All experiments are implemented by PyTorch 1.11.0 with two NVIDIA 4090 GPUs. We used batch-size of 2 and crop-size of 256.

2.3. Experimental Results

The highest metric achieved in the testing phase was 40.59 PSNR.

References

[1] Jiang, X., Zhang, X., Gao, N., and Deng, Y. (2024). "When Fast Fourier Transform Meets Transformer for Image Restoration." European Conference on Computer Vision: 381-402.

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