NFResNet: Multi-Scale and U-Shaped Networks for Deblurring

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Abstract : Multi-Scale and U-shaped Networks are widely used in various image restoration problems, including deblurring. Keeping in mind the wide range of applications, we present a comparison of these architectures and their effects on image deblurring. We also introduce a new block called as NFResblock. It consists of a Fast Fourier Transformation layer and a series of modified Non-Linear Activation Free Blocks. Based on these architectures and additions, we introduce NFResnet and NFResnet+, which are modified multi-scale and U-Net architectures, respectively. We also use three differ-ent loss functions to train these architectures: Charbonnier Loss, Edge Loss, and Frequency Reconstruction Loss. Extensive experiments on the Deep Video Deblurring dataset, along with ablation studies for each component, have been presented in this paper. The proposed architectures achieve a considerable increase in Peak Signal to Noise (PSNR) ratio and Structural Similarity Index (SSIM) value.

Keywords : multi-scale, Unet, deblurring, FFT, resblock, NAF-block, nfresnet, charbonnier, edge, frequency reconstruction **Conference Title :** ICCVML 2022 : International Conference on Computer Vision and Machine Learning

Conference Location : Paris, France

Conference Dates : December 29-30, 2022

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