ReWo Denoisor

Real world image denoising using deep learning

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ABSTRACT

Image denoising is a challenging problem in image processing which aims to remove noises from corrupted image while preserving the original details. Noise can degrade the quality and usability of images in various applications, such as photography and computer vision. Existing denoising methods are often focus on synthetic image and fail to handle complex structures and details of real-world images. This project is aimed to develop a deep learning techniques for real world image denoising.

This project proposes a novel CNN architecture designed for real-world image denoising with the goal of removing noise while maintaining image details and structures. The research gap addressed in this project is the need to enhance the performance of real-world image denoising using deep learning techniques. To achieve this goal, a thorough review of related works was conducted, and an architecture was developed by combining residual connections with feature attention. The proposed architecture was trained using a realistic dataset consisting of images captured from various cameras and smartphones. The performance of the proposed model was evaluated using PSNR and SSIM metrics. The results of the proposed model indicate that deep learning-based approaches can effectively remove noise while preserving image details and structures.

The evaluation of the proposed method was conducted on real-world image denoising datasets with comparison with CBDNet method. The experimental outcomes demonstrate that the proposed method surpasses in performance when evaluated against both quantitative metrics (PSNR and SSIM) and qualitative visual effects. Additionally, the suggested approach excels in preserving intricate details and edges while effectively avoiding excessive smoothing.

Subject Descriptors:

Computing methodologies → Machine learning → Machine learning approaches → Neural networks

Keywords:

Real-world image, Image denoising, Deep learning,