Improvement of Low-Light Filtering in Optical Distribution Boxes

Overview

To address these challenges, we propose a novel low-light image enhancement technique, LightenResDiff, which combines a residual diffusion model with the discrete wavelet transform. Abstract: In low-light environments, the performance of computer vision algorithms often deteriorates significantly, adversely affecting key vision tasks such as segmentation, detection, and classification. With the rapid advancement of deep learning, its application to low-light image processing. This paper proposes a novel Denoiser and Low-Frequency Enhancer Network (DLFE-Net) for Low-Light Image Enhancement (LLIE). The DLFE-Net addresses two key challenges: (1) overexposure and detail loss in local areas during enhancement, and (2) the effective removal of inherent noise in low-light. In low-light optical imaging, the scarcity of incident photons and the inherent limitations of imaging sensors lead to challenges such as low signal-to-noise ratio, limited dynamic range, and degraded contrast, severely compromising image quality and optical information integrity.

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Article Content

Multi-module enhanced low-light object detection: From image ...

To address the performance limitations of existing detectors in low-light scenarios, this paper proposes a low-light object detector—LOD-YOLO—based on an improved YOLOv8 architecture.

Fusion-based framework for low-light image enhancement using

A low-light image enhancement method based on multi-scale fusion that uses a filter in the reflectance has been proposed, which is effective at denoising the image while maintaining color

Unsupervised Compensation for Degradation in Low-Light Imaging via ...

Severe optical signal deterioration in dim environments significantly bottlenecks existing image enhancement algorithms. To tackle complex, sensor-induced corruptions without relying on

Low-light DEtection TRansformer (LDETR): object detection in low

To address this issue, we propose a Low-light Detection Transformer (LDETR), a transformer-based method that enhances images adaptively for improved detection performance.

A review of advancements in low-light image enhancement using

The difficulty in obtaining paired low-light and normal-light image datasets has made low-light image processing a challenging task. This challenge is exacerbated by uncontrollable illumination changes

A low illumination target detection method based on a dynamic

To address these issues, this study introduces an efficient target detection method for low illumination, named DimNet. This method optimizes the model through enhancements in multi

DLFE-Net: Preserving Details and Removing Noise Using HVI Color

As shown in Figure 5, our method exhibits significant advantages in low-light image enhancement, especially when dealing with images with uneven lighting distribution.

Low-Light Image Enhancement with Residual Diffusion Model in

This study employs deep learning algorithms to compensate for optical limitations in low-light imaging, demonstrating the enormous potential of diffusion models in the fields of photonics and

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Low-Light Detector Based on Feature Filtering and Enhancement

Abstract: Low-light scenarios pose a challenge for object detection due to noise and low brightness. The degraded feature maps are the main factors affecting detection performance.

CUI-Net: a correcting uneven illumination net for low-light image ...

In this paper, we propose a network called correcting uneven illumination network (CUI-Net) with sparse attention transformer and convolutional neural network (CNN) to better extract low

Low-light object detection via adaptive enhancement and dynamic

In recent years, researchers have explored various approaches, including image enhancement, feature extraction optimization, and multi-modal data fusion, to improve the

Enhanced optical efficiency and color purity for organic light-emitting ...

Enhanced optical efficiency and color purity for organic light-emitting diodes by finely optimizing parameters of nanoscale low-refractive index grid

Low-light image enhancement via collaborative dual-stream

Abstract This paper proposes a low-light image enhancement algorithm integrating dual-stream collaborative optimization and domain adaptation mechanisms. By hierarchically coupling

Optical Interference Suppression Based on LCD-Filtering

Using light emitting diodes (LED) for the purpose of simultaneous communication and illumination is known as visible light communication (VLC). Interference by ambient light sources is

Effects and Constraints of Optical Filtering on Ambient Light ...

Optical communication promises to be a high-rate supplement for acoustic communication in short-range underwater applications. In the photic zone of oceanic and coastal

A review of advancements in low-light image enhancement using deep ...

Observed limitations of existing studies are analysed, and directions for future research are proposed. This review serves as a useful reference for determining low-light image enhancement

A novel low light object detection method based on the YOLOv5 fusion ...

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This research offers a low-light target detection network, NLE-YOLO, based on YOLOV5, to address the issues of insufficient illumination and noise interference experienced by target

LED Pattern Enhancement for Light Distribution

Adjustable light distribution for LED lighting fixtures using optical patterns on the fixture cover. The cover has an optical pattern that transmits and reflects light from the LEDs to change the

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