

# Brightness splitter full-motion low-light processing



## Overview

To explore the joint task, we first establish real-world datasets for event-guided low-light enhancement and deblurring using a hybrid camera system based on beam splitters. Subsequently, we introduce an end-to-end framework to effectively handle these tasks. While event cameras offer potential solutions with superior low-light sensitivity and high temporal resolution, existing fusion methods typically employ staged strategies, limiting their effectiveness against combined low-light and motion blur degradations. They provide two key advantages: capturing scene details well even in low light due to their high dynamic range, and effectively capturing motion information during. The Low Light Image Enhancement (LLIE) task has been a hotspot in low-level computer vision research. e 10 different conditions) with 12 object classes (similar to PASCAL VOC) annotated on both image class level and local object bounding boxes. A small amount of unpaired images for testing.



## Article Content

Mar 23, 2026

Nanophotonic color splitters for high-efficiency imaging

In this work, we computationally explore the design process and performance of fully dielectric, low-index nanophotonic color splitters for imaging applications, with the splitter element

Feb 20, 2026

Flat-panel laser displays through large-scale photonic

Photonic integrated circuits allow laser displays to be flattened into a compact form factor while improving efficiency and colour performance.

Jul 21, 2025

Awesome Low Light Image Enhancement

Introduction Low light imaging and low light image enhancement have wild applications in our daily life and different scientific research fields, like night

Sep 02, 2025

Research on image brightness enhancement algorithm based on deep ...

In consideration of traditional improvement algorithms' faults, and under the precondition of studying low-light improvement techniques in image signal processing (ISP) systems, deep

Feb 24, 2026

A low-light image enhancement framework based on hybrid multiscale ...

In low-light image processing, brightness and contrast are two crucial parameters in human visual perception. To ensure that the processed image enhances weak details while maintaining

Jan 31, 2026

Low brightness PCB image enhancement algorithm for FPGA

Building on this analysis, this paper proposes the MGIE algorithm for image brightness enhancement, accompanied by an FPGA-based acceleration scheme. This combination not only

Dec 01, 2025

FPGA-based low-light image enhancement using

This paper introduces an FPGA-based system utilizing the Retinex algorithm for low-light image enhancement, implemented on a Coarse-Grained

Feb 03, 2026

From Sim-to-Real: Toward General Event-based Low

This approach utilizes the internal statistics of a sequence to handle degraded event data under low-light conditions, improving the generalizability to

Jun 22, 2026

ComTech2303014Sorokin.fm

However, the use of global methods for processing images with a large brightness difference does not allow one to achieve a significant improvement in the detail of low-contrast objects, global methods

Feb 19, 2026

Low-light color image equalization based on adaptive brightness ...

Low-light color images are limited in their application in fields such as security monitoring and autonomous driving due to issues such as dim brightness and blurry details.

Dec 23, 2025

Color and Luminance Separated Enhancement for Low

Utilizing a pretrained model, adaptive brightness information is extracted and mapped from low-light images, which is then enhanced through a

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Exposure versus contrast enhancement in low-light 4k videos

The terms “exposure enhancement” and “contrast enhancement” are usually used interchangeably for image enhancement in low-light acquisitions. This paper argues that the two

Dec 11, 2025

CompEvent: Complex-valued Event-RGB Fusion for Low-light Video ...

By leveraging the holistic representation capability of complex-valued neural networks, CompEvent achieves full-process spatiotemporal fusion, maximizes complementary learning

Dec 25, 2025

A comprehensive review of low-light image enhancement methods

As a result, enhancing the quality of low-light images has become a crucial research focus in image processing. To this end, this paper provides a comprehensive review that not only traces

May 25, 2026

Enhanced low-light image fusion through multi-stage processing with ...

This manuscript introduces an innovative multi-stage image fusion framework that adeptly integrates infrared (IR) and visible (VIS) spectrum images to surmount the difficulties posed by low

May 30, 2026

CVPR 2024 Open Access Repository

The DE-branch adopts a combination of DiffIR and LEDNet to reduce noise and enhance brightness while the DP-branch utilizes a novel Light Full-Former (LFF) method which comprises 20 Full

Jun 15, 2026

Digital Light Processing and its Future Applications

DLP-based displays have inherently low flicker because all pixels are updated at the same time (there is no line-to-line temporal phase shift) and because the PWM bit-splitting algorithm produces short

Mar 06, 2026

National Center for Biotechnology Information

Hier sollte eine Beschreibung angezeigt werden, diese Seite lässt dies jedoch nicht zu.

Mar 15, 2026

A Comprehensive Survey on Image Signal Processing Approaches for Low ...

Deep learning has been widely applied in many domains including image enhancement , image generation , and image captioning . In image enhancement, it has been very effective for low

Nov 03, 2025

Efficient polarization beam splitter based on the optimized ...

The significant advantages of the SLP can find important applications in low-light-level nonlinear optics, photonic quantum information processing without a cavity, and the efficient spatial

Feb 22, 2026

## LLISP: Low-Light Image Signal Processing Net via Two-Stage Network

In order to remove heavy noise, correct color bias and enhance details more effectively, we propose a two-stage Low Light Image Signal Processing Network named LLISP. The design of

Oct 07, 2025

arXiv:2408.14916v1 [cs.CV] 27 Aug 2024

In low-light conditions, capturing videos with frame-based cameras often requires long exposure times, resulting in motion blur and reduced visibility. While frame-based motion deblurring and low-light en

Nov 23, 2025

High accuracy beam splitting using spatial light modulator combined ...

Phase-only spatial light modulators are ideal for the generation of beam splitter profiles to parallelize a variety of laser processes. A novel apprao

Mar 22, 2026

Gradient and Brightness Guided Low-Light Enhancement with

Low-light image enhancement aims to reconstruct images with insufficient illumination into visually appealing representations with natural brightness. While most existing methods tend to focus on

Mar 08, 2026

Full HD Low-Light Video Real-Time Enhancement for General

Aiming at the poor observation effect of video images due to insufficient light source or unbalanced illumination, and the difficulty of real-time performance o

Apr 30, 2026

Low-light enhancement method with dual branch feature fusion and ...

To solve this problem, we propose a two-stage size-controllable low-light enhancement method, named Dual Fusion Enhancement Net (DFEN). The whole algorithm is built on a double U

Mar 26, 2026

FPGA-based low-light image enhancement using

Proposed approach This paper aims to address these gaps by introducing an FPGA-based low-light image enhancement system that combines

Jan 09, 2026

Phydiisp: a physics-guided differentiable pipeline for low-light ...

In low-light environments, machine vision tasks often suffer from performance degradation because traditional Image Signal Processing (ISP) pipelines are primarily optimized for image quality

Dec 12, 2025

Towards Real-world Event-guided Low-light Video Enhancement and

To simultaneously capture normal-light images, low-light images, and the corresponding event stream, we designed a triple-axis beam-splitter-based camera system, as shown in Fig. 2.

## Contact Us

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