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FLIME - Fast Low Light Image Enhancement for Real-Time Video

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Abstract : Low Light Image Enhancement is of utmost impor- tance in computer vision based tasks. Applications include vision systems for autonomous driving, night vision devices for defence systems, low light object detection tasks. Many of the existing deep learning methods are resource intensive during the inference step and take considerable time for processing. The algorithm should take considerably less than 41 milliseconds in order to process a real-time video feed with 24 frames per second and should be even less for a video with 30 or 60 frames per second. The paper presents a fast and efficient solution which has two main advantages, it has the potential to be used for a real-time video feed, and it can be used in low compute environments because of the lightweight nature. The proposed solution is a pipeline of three steps, the first one is the use of a simple function to map input RGB values to output RGB values, the second is to balance the colors and the final step is to adjust the contrast of the image. Hence a custom dataset is carefully prepared using images taken in low and bright lighting conditions. The preparation of the dataset, the proposed model, the processing time are discussed in detail and the quality of the enhanced images using different methods is shown.

Keywords : low light image enhancement, real-time video, computer vision, machine learning
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