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A comparative Study of Image Enhancement Techniques for Natural Images

Ahmed Naser Ismael [a*]

[a] *College of Adminstration and Economic, University of Basrah, Iraq, Ahmed.ismael@uobasrah.edu.iq*

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ABSTRACT

Enhancement is most interesting parts in image processing field. It uses to enhance the structural appearance for picture without the degradation in the original input image. The enhancement techniques become the important key and simply extraction features by removing noise and another items inside an image. Several enhancement techniques have achieved with different and inaccurate results. The aim of this paper, the nature images quality was improved by the many enhancement techniques like of Histogram Equalization (HE), Local Histogram Equalization (LHE), Adaptive Histogram Equalization (AHE), Contrast Limited Adaptive Histogram Equalization (CLAHE), Brightness Preserving Bi-Histogram Equalization (BBHE), Dualistic Sub-Image Histogram Equalization (DSIHE) and Recursive sub-image histogram equalization (RSIHE). In evaluation step, the performance of all these techniques are examined by values measurements of SSIM (Structural Similarity Index Matrix), Entropy, Peak Signal-to-Noise Ratio (PSNR) and Signal to Noise Ratio (SNR). The comparisons of the better existing results are given because to explain the best possible technique that can be used as suitable image enhancement. The results of the enhanced of 15 nature images have showed DSIHE technique has a batter a values of SSIM and Entropy with 0.9885 and 59975 respectively. Overall, based on the PSNR and SNR values, the CLAHE technique are recorded values higher than of other six techniques in 21.2952 and 192932 values.

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1. Introduction

Image enhancement shows primary task which used by image processing uses. It used by experts to make decisions with respect to the image material. Style of image enhancement contain noise reduction, edge enhancement and contrast enhancement (Qi et al., 2022). The improving of stored image power may be need to using enhancement techniques. These techniques have used to increase or decrease contrast to gives an image lighter or darker. In addition, image enhancement has used for improving the information's sensitivity inside images used to human watchers or to suggest enhanced input for further fixed image processing techniques. The goal of image enhancement is to improve the exploitability or perception of information inside images for human watchers, and to deliver improved input for other robotic techniques which are more useful used in image processing (Wang et al., 2021).

∗Corresponding author

Email addresses:

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