

AN APPROACH TO COLOR IMAGE ENHANCEMENT USING MINIMUM MEAN BRIGHTNESS ERROR DYNAMIC HISTOGRAM EQUALIZATION

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ABSTRACT. *Image contrast enhancement by applying Histogram Equalization (HE) has become an accepted and popular technique. This technology has been widely used due to its simplicity and effectiveness. However, together with some advantages, HE often hampers the mean brightness of image to the mid-level (in gray-level range). Saturation effect is one typical example of this unwanted visual deterioration which is often caused by HE technique. Due to these grounds, it is not always enviable to implement HE directly in consumer electronic products like television. It is equally important to preserve the input brightness and keep PSNR of an image to an optimum level to avoid the generation of non-existing artifacts in the output image. In order to overcome this particular problem, a novel image enhancement method, known as Minimum Mean Brightness Error Dynamic Histogram Equalization (MMBEHDE) was proposed in the preceding study to attain maximum brightness preservation. Nowadays, most of the consumer electronic products use color images. This paper is an attempt to synthesis some paths to develop this method for color image contrast enhancement. To do so, several color spaces were chosen and used in this method to validate its performance over others.*

Keywords: Color image enhancement, Brightness preservation, Dynamic histogram equalization, Color space

1. Introduction. The goal of image enhancement is to process an image so that the outcome is more suitable than the original image for any specific application. The technique not only improves the visual interpretability for human viewers but also increase the acuity of information contained within the image. Due to these counts, it is important to develop better image processing techniques to foster its application in automated image processing like image analysis, detection, segmentation, recognition and data hiding [1-6]. On the basis of these grounds, digital color image enhancement, preserving brightness is an emerging research issue in the field of digital image processing, especially for consumer electronics [7].

Histogram Equalization (HE) is one of the most reliable, acceptable and extensively applied algorithms to perform image enhancement [8,9]. HE also flattens and stretches the dynamic range of image histogram and it results in overall image contrast enhancement [10]. In HE, there are some gray levels in the image, which occur frequently and dominate