**Image Contrast Enhancement for Brightness Preservation Based on Dynamic Stretching**

**ABSTRACT**

Histogram equalization is an efficient process often employed in consumer electronic systems for image contrast enhancement. In addition to an increase in contrast, it is also required to preserve the mean brightness of an image in order to convey the true scene information to the viewer. A conventional approach is to separate the image into sub-images and then process independently by histogram equalization towards a modified profile. However, due to the variations in image contents, the histogram separation threshold greatly influences the level of shift in mean brightness with respect to the uniform histogram in the equalization process. Therefore, the choice of a proper threshold, to separate the input image into sub-images, is very critical in order to preserve the mean brightness of the output image. In this research work, a dynamic range stretching approach is adopted to reduce the shift in output image mean brightness. Moreover, the computationally efficient golden section search algorithm is applied to obtain a proper separation into sub-images to preserve the mean brightness. Experiments were carried out on a large number of color images of natural scenes. Results, as compared to current available approaches, showed that the proposed method performed satisfactorily in terms of mean brightness preservation and enhancement in image contrast.

***Keywords:*** Image Contrast Enhancement, Histogram Equalization, Brightness Preservation, Golden Section Search.