Abstract

In this paper the performance of four techniques for contrast enhancement of digital images was investigated. The techniques are: histogram equalization (HE), thresholded histogram equalization (WTHE), the low-complexity histogram modification algorithm (LCHM) and a newly developed technique which is a combination of two techniques (HEFGLG): the histogram equalization (HE) and the Fast Gray Level Grouping (FGLG). The performance was compared using different images (gray scale as well as colored) in order to identify which algorithm has the best performance across a variety of images from different sensors and having varying characteristics. Based on the visual quality and the quantitative measures: Absolute Mean Brightness Error (AMBE), the discrete entropy (H), and the measure of enhancement (EME). The experimental results showed that the HEFGLG algorithm outperforms other algorithms. It has the advantage that it has low time complexity since it is a combination of two techniques HE and FGLG, each has low time complexity.

**Index Terms**

Computer Science  
Image Processing
Keywords

Histogram Equalization, Low-complexity histogram modification, Weighted-thresholded histogram equalization, Combined algorithm