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Research Article

Multiobjectives bihistogram equalization for image contrast enhancement

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image enhancement; equalization; optimization; partition; brightness

The global histogram equalization (HE) has been the most frequently adopted image contrast enhancement technique. A brightness and detail-preserving HE method with good contrast enhancement effect has been a goal of much recent research in HE. Nevertheless, producing a well-balanced HE is deemed to be a daunting task. In this article, we propose a novel framework of HE with the aim of taking three desirable properties into account: brightness preservation, detail preservation, and contrast enhancement. We termed the proposed method as multipurpose beta optimized bi-HE (MBOBHE). MBOBHE consists of performing the histogram optimization separately in both sub-histograms after the segmentation of histogram using an optimized separating point based on the three performance criteria using a weighted-sum aggregated objective function (AOF). Both quantitative and qualitative results indicate that MBOBHE outperforms other existing bi-HE methods, in terms of comprehensive performance of HE that is capable of providing a holistic view. © 2014 Wiley Periodicals, Inc. Complexity, 2014

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