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# Image quality assessment for contrast enhancement evaluation

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**Abstract:** Although the contrast enhancement (CE) is a great challenge, few efforts have been conducted on evaluation of the contrast changes. In this paper, we propose a contrast-changed image quality (CCIQ) metric including a local index, named edge-based contrast criterion (ECC), and three global measures. In the global measures, entropy, correlation coefficient and mean intensity are exploited. Particle swarm optimization (PSO) algorithm is utilized for obtaining an optimal combination of these quantities. Although the presented method utilizes the original image, it cannot be considered as a full-reference metric, since the original image is not regarded to have the ideal quality. Hence, it can be concluded that it follows a new paradigm in image quality assessment. Experimental results on the three benchmark databases, CID2013, TID2013 and TID2008 demonstrate that the proposed metric outperforms the-state-of-the-art methods.

**Keywords:** Image quality assessment (IQA), Contrast enhancement, Particle swarm optimization (PSO).

## 1. Introduction

The image quality assessment (IQA) research aims to develop a quality measure which is well consistent with human subjective evaluations. IQA methods can be divided into three groups according to the existence of the ideal original image: full-reference (FR), no-

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