An analysis of image quality assessment algorithm to detect the presence of unnatural contrast enhancement

ABSTRACT

Image contrast enhancement purposely aim the visibility of image to be increased. Most of these problems may happen after contrast enhancement: amplification of noise artifacts, saturation-loss of details, excessive brightness change and unnatural contrast enhancement. The main objective of this paper is to present an extensive review on existing Image Quality Assessment Algorithm (IQA) in order to detect the presence of unnatural contrast enhancement. Basically, the IQA used produced quality rating of the image while consistently with human visual perception. Current IQA to detect presence of unnatural contrast enhancement: Lightness Order Error (LOE), Structure Measure Operator (SMO) and Statistical Naturalness Measure (SNM). However, result of current IQA evaluation shows it may not giving consistent quality rating with human visual perception. Among three IQAs, SNM demonstrate better performance compared to LOE and SMO. But, it suffers with consistent rating for different spatial image resolution in same image content. Thus, an improvement suggested in this paper to overcome such problem occurred.

Keyword: Contrast enhancement; Contrast naturalness; Naturalness quality; Unnatural enhancement