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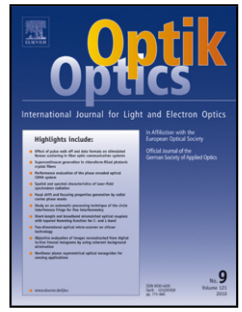

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Blind Image Quality Assessment via Content-Invariant Statistical Feature

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Abstract*—A large number of blind image quality assessment (BIQA) methods take advantage of statistical features. Those statistical features-based methods are under the assumption that when the distortion damages the structures of images the statistical distributions of images will change. The traditional statistical features focus on the 'changes' caused by distortions, but few researches focus on that the image contents could disturb the statistical property for BIQA task. Here we aim to develop a robust image quality statistical feature named content-invariant statistical feature (CISF), which is sensitive to image quality but insensitive to image content, and hence could effectively reduce the disturbance caused by image content in image quality assessment task. To this end, we first convolute images with a set of multi-scales Laplacian-of-Gaussian (LOG) kernels to obtain a set of response maps and extract the curves of pixel sequence (CPS) from the response maps. Then, we calculate the fitting parameters of the CPSs with asymmetric Generalized Gaussian distribution and compute the statistical histograms of the fitting parameters as the CISF features. Finally, we use the developed CISF features and a simple support vector regression (SVR) model for BIQA. In the experiments, we evaluate our method on three large-scale benchmark databases and highly competitive performance is achieved compared with state-of-the-art BIQA models.

***Index Terms*—Blind Image Quality Assessment, Laplacian of Gaussian Filter, Feature-Maps**

I. Introduction

THE desirable goal of no-reference image quality assessment (NR-IQA) method is to predict the quality score of a distorted image without any information of reference images, and the quality score is correlated well with that predicted by human. Almost all digital images are subject to distortions during acquisition, compression, transmission, processing, etc., which directly affect the performance of some typical applications, such as object detection [1–5], scene recognition [6], image and video saliency detection [7–11], and other image processing application [12–15]. Therefore, evaluating the perceptual quality of an

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