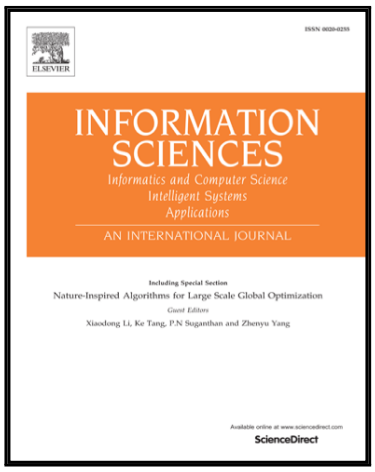

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Blind Assessment for Stereo Images Considering Binocular Characteristics and Deep Perception Map Based on Deep Belief Network

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Abstract

In recent years, blind image quality assessment in the field of 2D image/video has gained the popularity, but its applications in 3D image/video are to be generalized. In this paper, we propose an effective blind metric evaluating stereo images via deep belief network (DBN). This method is based on wavelet transform with both 2D features from monocular images respectively as image content description and 3D features from a novel depth perception map (DPM) as depth perception description. In particular, the DPM is introduced to quantify longitudinal depth information to align with human stereo visual perception. More specifically, the 2D features are local histogram of oriented gradient (HoG) features from high frequency wavelet coefficients and global statistical features including magnitude, variance and entropy. Meanwhile, the global statistical features from the DPM are characterized as 3D features. Subsequently, considering binocular characteristics, an effective binocular weight model based on multiscale energy estimation of the left and right images is adopted to obtain the content quality. In the training and testing stages, three DBN models for the three types features separately are used to get the final score. Experimental results demonstrate that the proposed stereo image quality evaluation model

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