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Combining LBP Difference and Feature Correlation for Texture Description

Abstract:

Effective characterization of texture images requires exploiting multiple visual cues from the imageappearance. The local binary pattern (LBP) and its variants achieve great success in texture description. However, because the LBP(-like) feature is an index of discrete patterns rather than a numerical feature, it is difficult to combine the LBP(-like) feature with other discriminative ones by a compact descriptor. To overcome the problem derived from the nonnumerical constraint of the LBP, this paper proposes a numerical variant accordingly, named the LBP difference (LBPD). The LBPD characterizes the extent to which one LBP varies from the average local structure of an image region of interest. It is simple, rotation invariant, and computationally efficient. To achieve enhanced performance, we combine the LBPD with other discriminative cues by a covariance matrix. The proposed descriptor, termed the covariance and LBPD descriptor (COV-LBPD), is able to capture the intrinsic correlation between the LBPD and other features in a compact manner. Experimental results show that the COV-LBPD achieves promising results on publicly available data sets.