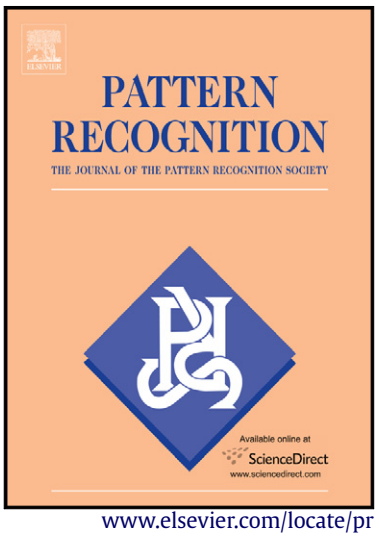

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A Scale- and Orientation-Adaptive Extension of Local Binary Patterns for Texture Classification

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Abstract

Local Binary Patterns (LBP) have been used in a wide range of texture classification scenarios and have proven to provide a highly discriminative feature representation. A major limitation of LBP is its sensitivity to affine transformations. In this work, we present a scale- and rotation-invariant computation of LBP. Rotation-invariance is achieved by explicit alignment of features at the extraction level, using a robust estimate of global orientation. Scale-adapted features are computed in reference to the estimated scale of an image, based on the distribution of scale normalized Laplacian responses in a scale-space representation. Intrinsic-scale-adaption is performed to compute features, independent of the intrinsic texture scale, leading to a significantly increased discriminative power for a large amount of texture classes. In a final step, the rotation- and scale-invariant features are combined in a multi-resolution representation, which improves the classification accuracy in texture classification scenarios with scaling and rotation significantly.

Keywords: LBP, texture, classification, scale, adaptive, rotation, invariant, scale-space

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