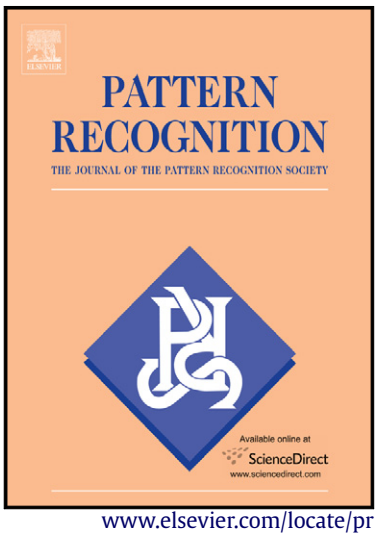

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Joint Adaptive Median Binary Patterns for Texture Classification

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Abstract

This paper addresses the challenging problem of the recognition and classification of textured surfaces given a single instance acquired under unknown pose, scale and illumination conditions. We propose a novel texture descriptor, the Adaptive Median Binary Pattern (AMBP) based on an adaptive analysis window of local patterns. The principal idea of the AMBP is to convert a small local image patch to a binary pattern using adaptive threshold selection that switches between the central pixel value as used in the local binary pattern (LBP) and the median as in median binary pattern (MBP), but within a variable sized analysis window depending on the local microstructure of the texture. The variability of the local adaptive window is included as joint information to increase the discriminative properties. A new multiscale scheme is also proposed in this paper to handle the texture resolution problem. AMBP is evaluated in relation to other recent binary pattern techniques and many other texture analysis methods on three large texture corpora with and without noise added, CUReT, Outex_TC00012 and KTH_TIPS2. Generally, the proposed method performs better than the best state-of-the-art techniques in the noiseless case and significantly outperforms all of them in the presence of impulse noise.

Keywords: Adaptive median, local binary pattern, impulse noise, rotation invariance, multiscale, texture classification.