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Wavelet Completed Local Ternary Pattern (WCLTP) for Texture Image Classification

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In this paper, a new texture descriptor inspired from Completed Local Ternary Pattern (CLTP) is proposed and investigated for texture image classification task. A wavelet-CLTP (WCLTP) is proposed by integrating the CLTP with the redundant discrete wavelet transform (RDWT). Firstly, the images are decomposed using RDWT into four sub-bands. Then, the CLTP are extracted from the LL sub-bands coefficients of the image. The RDWT is selected due to its advantages. Unlike the other wavelet transform, the RDWT decompose the images into the same size sub-bands. So, the important textures in the image will be at the same spatial location in each sub-band. As a result, more accurate capturing of the local texture within RDWT domain can be done and the exact measure of local texture can be used. The proposed WCLTP is evaluated for rotation invariant texture classification task. The experimental results using CURTex and Outex texture databases show that the proposed WCLTP outperformed the CLBP and CLBC descriptors and achieved an impressive classification accuracy. Furthermore, the WCLTP outperformed the CLTP in Outex and many cases in the CURTex databases.

Keywords: texture descriptors, local binary patterns (LBP), Local Ternary Pattern (LTP), Wavelet Transform, rotation invariance, Computational Intelligence

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A New Approach of Optimal Search Solution in Particle Swarm Optimization (PSO) Algorithm for Object Detection Method

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In video tracking system, the big data era has brought with it new challenges to computer vision and image understanding. The main challenges are using the conventional method is the uncertainty in the accuracy and precision of the detected object motion. Furthermore, the process of detected an object in every frame is time consuming as the entire frame must be detected to precisely locate the object system. Therefore, to overcome the several problems associated with the object detection method, a new approach in Particle Swarm Optimization (PSO) algorithm for optimal search solution as an alternative method to detect of object tracking quickly, precisely and accurately. Finally, performance analysis will be undertaken to justify the strength of the proposed method over conventional algorithm can reduce more than 60% of the required number of particles and iteration.

Keywords: Optimal Search Solution, Particle Swarm Optimization, Object Detection, Object Tracking