

Performance Evaluation of Different Local Binary Operators for Texture Classification

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ABSTRACT

Local Binary Patterns (LBP) have brightened up as one of the most eminent and widely studied texture descriptors. LBP has gained high acceptance due to its simplicity, high distinguishing power, and flexibility. As such, it has been deployed in several applications where it has performed well. This is why LBP is the basis for a new research direction. However, LBP has limitations that may affect its accuracy. Therefore, many descriptors based on LBP have been proposed to overcome its limitations and enhance its accuracy, such as Local Ternary Pattern (LTP), Completed Local Binary Pattern (CLBP), Completed Local Binary Count (CLBC), Completed Local Ternary Pattern (CLTP), and Wavelet Completed Local Ternary Pattern (WCLTP). This paper is focused to provide a comparative analysis by studying and evaluating the performance of LBP descriptor and five of its variants using three well-known benchmark texture datasets. Furthermore, this study also seek to improve the role of image texture information in classification processes. Different experiments were conducted using three benchmark texture datasets which are CURET, OuTex and UIUC. The experimental results showed that WCLTP outperformed other texture descriptors and achieved the highest classification accuracy in all experiments. WCLTP achieved 99.35%, 96.57% and 94.80% classification accuracy with CURET and OuTex and UIUC respectively.

KEYWORDS: LBP; Texture classification; Texture descriptor; OuTex dataset; CuRTex dataset.

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