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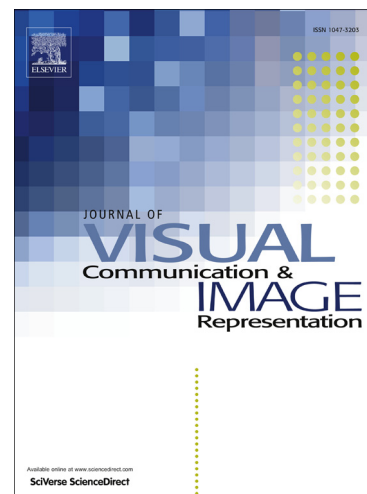
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Incremental Low-Rank and Sparse Decomposition for Compressing Videos Captured by Fixed Cameras

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Abstract

Videos captured by stationary cameras are usually with a static or gradually changed background. Existing schemes are not able to globally exploit the strong background temporal redundancy. In this paper, motivated by the recent advance on low-rank and sparse decomposition (LRSD), we propose to apply it for the compression of videos captured by fixed cameras. In particular, the LRSD is employed to decompose the input video into the low-rank component, representing the background, and the sparse component, representing the moving objects, which are encoded by different methods. Moreover, we further propose an incremental LRSD (ILRSD) algorithm to reduce the large memory requirement and high computational complexity of the existing LRSD algorithm, which facilitates the process of large-scale video sequences without much performance loss. Experimental results show that the proposed coding scheme can significantly improve the existing standard codecs, H.264/AVC and HEVC, and outperform the state-of-the-art background modeling based coding schemes.

Keywords: Video coding, stationary camera, incremental low-rank and sparse decomposition, CUR decomposition, background subtraction

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