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A COMPRESSED DOMAIN MULTIPURPOSE VIDEO WATERMARKING ALGORITHM USING VECTOR QUANTIZATION

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Abstract. *In this paper, we first propose a hybrid video compression scheme based on vector quantization (VQ). The proposed video compression scheme determines the quantization strategy of each macroblock according to its perceptual impact on the human visual system (HVS). We also propose an oblivious multipurpose watermarking algorithm for this VQ based video compression scheme. The robust and fragile watermarks are embedded into the compressed video stream for copyright protection and content authentication respectively. We embed the robust watermark based on the polarities of discrete cosine transform (DCT) coefficients, which does not introduce any distortion to the original video. The fragile watermark is embedded in VQ indices by utilizing the codebook partition strategy. The proposed video compression and watermarking algorithms are simulated in detail. Both spatial and temporal attacks are performed to evaluate the robustness and fragility of the proposed multipurpose watermarking algorithm.*
Keywords: Digital watermarking, Multipurpose video watermarking, Vector quantization, Compressed domain watermarking

1. **Introduction.** The booming development of computer networks and multimedia streaming technologies has made the distribution of multimedia data rather easy and common. At the same time, multimedia service providers are reluctant to offer their works in digital forms because of the infringement during the distributing and duplicating processes. Therefore, intensive attentions have been paid on the copyright protection of multimedia data. Encryption and watermarking are two main technologies to enforce copyright protection [1], while the protection via encryption does not work once the digital data are received and decrypted. More and more attentions have been paid on the studies of watermarking algorithms for various kinds of multimedia data, such as still images [2,3], audio, video [4], text files, vector map [5] and 3D models.