Abstract

An efficient video watermarking algorithm using DWT-DCT-SVD is proposed to analyze the robustness against various attacks. In this algorithm, video is divided into several groups of frames, so that each group of frames carries various watermarks. In the proposed method, each plane of video frames are decomposed using DWT and high frequency band HH, middle frequency bands LH, HL are transformed with DCT. The DCT coefficients are SVD transformed which are embedded with corresponding transformed coefficients of watermarks. The desired number of watermarks will be embedded in selected group of frames without causing noticeable distortion. The amount of inserted watermarks is controlled by Peak Signal to Noise Ratio of the watermarked frame to achieve good imperceptibility according to human visual system. The embedded watermarks are extracted from watermarked video with inverse process. Similarity between original and extracted watermarks is estimated by measuring correlation coefficient. The proposed algorithm is tested with various video sequences using MATLAB software. Reported experimental results show the watermarked frames are indistinguishable from the original frames subjectively and demonstrate the effectiveness of the proposed algorithm against the attacks of frame averaging, dropping, swapping, compression, Gaussian noise, salt & pepper noise, median filtering, average filtering, sharpening, histogram equalization, rotation, cropping.
References


Index Terms

Computer Science

Security

Keywords
DWT  DCT  SVD  PSNR  CF  Attacks