ISSN 2349-7815

International Journal of Recent Research in Electrical and Electronics Engineering (IJRREEE)
Vol. 2, Issue 4, pp: (77-78), Month: October - December 2015, Available at: www.paperpublications.org

Adaptive Video Watermarking and Quality Estimation

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Abstract: **Watermarking is mainly projected for copy right protection, data safeguard, and data thrashing, etc. Nowadays all the communication requires protection. Estimation of video quality has a major role in today's video distribution, communication control and e-commerce. Consumer fulfillment is achieved by providing good quality. Here the video input is changed into frames and the image set as watermark is embedded into the frames. The embedding process is carried out using DWT, then the embedded frame and other remaining frames are again changed into video file and it is transmitted. At the receiver side watermark image is extracted from the video. Finally, by using metrics such as TDR, PSNR the quality of watermark image is estimated under distortion. All experiments and tests are carried out using MATLAB.**

Keywords: **TDR, PSNR, watermark image, copy right protection, data safeguard, and data thrashing.**

I. INTRODUCTION

The advancement of Internet has enabled the extensive spread of digital multimedia information in the form of text, image, audio and video. It makes more easy distribution and illegal copying. Researchers have been frustrating to deal with this problem by watermarking techniques from both the academy and the industry. Watermarking, as a credible weapon next to piracy, embeds information into the host information with no degradation in the perceptual quality of the host information. Two important components in digital watermarking systems are embedder and the detector.

Two main categories for video watermarking approaches can be classified based on the method of hiding watermark bits in the host video. The two categories are: Spatial domain watermarking where embedding and detection of watermark are performed by directly manipulating the pixel intensity values of the video frame. Transform domain techniques, on the other hand, alter spatial pixel values of the host video according to a pre-determined transform and are more robust than spatial domain techniques since they disperse the watermark in the spatial domain of the video frame making it difficult to remove the watermark through malicious attacks like cropping, scaling, rotations and geometrical attacks. The commonly used transform domain techniques are Discrete Fourier Transform (DFT), the Discrete Cosine Transform (DCT), and the Discrete Wavelet Transform (DWT). Embedding part consist of a watermark insertion part that uses the original and the watermark image where Hiding also made. After the process, image is noticeable to all. Hiding cannot offer protection to the content. Algorithm is applied to protect the content. By proper selection of algorithm hacking can be avoided. Detection part consist of Finding the watermarked position, and Getting back the watermark information.

II. PROPOSED METHOD

The proposed method which performs watermark embedding into video content is based on Discrete Wavelet Transform (DWT). Reasons for the usage of this orthogonal transformation are its good results in applications which deal with video processing. The described method is based on watermarking in still images. Video watermarking, where video is a nonstop form of frames which has 25/30/50/60 frames per second (fps) in which the secret information is embedded. For that, it should be changed into frames and subsequently embedding the watermark image into any one of the frames and

also to the whole frames. Finally watermarked frame/frames are changed into a watermarked video. For the transform we use 3 level DWT .The DWT coefficients undergo tree based watermark embedder. After that IDWT is applied .Thus watermarked video is produced. It is transmitted to the receiver side .At the receiver inverse process is done

III. ADAPTIVE VIDEO WATERMARKING AND QUALITY ESTIMATION

In our scheme, an input video is split into audio and video stream and undergoes watermarking respectively. On the other hand, a watermark is decomposed into different parts which are embedded in corresponding frames of different scenes in the original video. As applying a fixed image watermark to each frame in the video leads to the problems in maintaining statistical and perceptual invisibility our scheme employs independent watermarks for successive but different scenes .In the extraction process a test video is split into video stream and audio stream and watermarks are extracted separately by audio watermark extraction and video watermark extraction. Then the extracted watermark undergoes refining process.

In the quality estimation scheme

The extracted watermark is compared with the original watermark bit by bit and the True Detection Rates The image quality is estimated by mapping the calculated TDR to a quality value by referring to a mapping function.

$\tilde{Q}$=f(TDR)

Where$\tilde{Q}$ is the estimated quality; f(•) is the mapping function, which is the "Ideal Mapping Curve" in the proposed scheme.

ACKNOWLEDGMENT

The author would like to thank teachers and friends in Mar Baselios Institue of Technology.

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