ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Volume 4, Issue 4, April 2017

Efficient Video Watermarking and Image Data Encryption Technique

[1]Priya Sonawane, [2]Sujata Mane, [3]Priya Barhalikar, [4]Reshma Nazirkar4
[5]Prof. Aruna Verma
[1] [2] [3] [4]B.E. Student, [5]Assistant Professor
[1] [2] [3] [4] [5]Dept. of Computer Engineering, Dhole Patil College Of Engineering, Wagholi, Pune.

Abstract :- **— Proposed technique is based on DWT, DCT FFT, and SVD. First video is converted into frames. Apply DWT on each frame that will convert it into four sub-band frequency ranges as LL, LH, HL, and HH. Apply again DWT on LL sub-band then it will divide as LL1, LH1, HL1, and HH1 sub band of LL band. After applying DWT at 2-level, apply SVD in LL1 Sub-band, DCT in LH1 and FFT in HH1 sub-band of LL band. Same process will be applied on watermark symbol/image. Embed both host frame and watermark image with some scaling factor 'α'. For watermarked video arrange all the decomposed matrices using inverse technique. Watermarked video will be generated. To proof of ownership watermarking extraction process would be follow And for proofing robustness and security level of this watermarked technique watermarked video will be compared with original video And NCC, PSNR, BER value would be calculated.**

Keywords: **- image processing, DWT,DCT,FFT,SVD,PSNR,NCC, BER**

I. INTRODUCTION

Internet has become indispensible and thus the security and the privacy issue have come to the fore of the computing fraternity. These issues need to be addressed with utmost urgency and highest level of dedication. Watermarking addresses the privacy and security issues. Watermarking has helped not just in security but also in resolving numerous copyright and privacy issues, which became one of the most contentious issues while the expansion of internet. Domain of watermarking technique is divided in to two parts such as on the basis of spatial domain and other is on the basis of frequency domain. In spatial domain watermarking, watermark is embedded by modifying the pixels value of the host image/ video directly. The main advantages of pixel based methods are that they are conceptually simple and have very low computational complexities and therefore are widely used in video watermarking where real-time performance is a primary concern. In frequency domain, the watermark is embedded for the robustness of the watermarking mechanism. There are three main methods of data transmission in frequency domain. as DCT DFT and DWT. The main strength offered by transforming domain techniques is that they can take advantage of special properties of alternate domains to address the limitations of pixel-based methods or to support additional features. Generally, transform domain methods require higher computational time. In transform domain technique, the watermark is embedded distributive in overall domain of an original data. Host video is first converted into frequency domain by transformation techniques. The transformed domain coefficients are then altered to store the watermark information. The inverse transform is finally applied in order to obtain the watermarked video.

On the basis of document watermarking can be apply on Image, Text, Audio and Video. According to the human perception watermarking is divided in to two parts visible watermark media and invisible watermark media. Invisible watermark is further are of two types robust watermarking and fragile watermarking. For effective watermarking the watermarking techniques need to be imperceptible, robust, and secure from various attacks

II. LITERATURE SURVEY

In author has proposed by using DFT compare with DWT QR Code embedded technique for invisible watermarking [1]. The DFT can allow to QR Code image broken up in to different frequency band by using block DWT that differences between coefficient and DWT algorithm that use Haar Wavelet Transform method hierarchically decompose a QR Code image into a series of successively lower frequency approximation sub band and their associated detail sub bands .In author has define by using QR code hiding audio based data and for achieved this technique's quality used AI technique was watermark

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Volume 4, Issue 4, April 2017

image and the sim value of the extracted watermark after certain attack will be poor. The robust performance can be achieved[2]. In Author has define divided block of image by QR code into the DWT domain using robust method. This technique was embedded information and extracted correctly even if the images are compressed to less percentage of the original according to the contents of the images[3] .In author has proposed reliable SVD-based image watermarking. It was solving the critical situation and false positive problem and get PSNR value[4]. In author has proposed SVD based watermarking algorithm for ownership protection. This techniques is more robotic and solve false positive flow in SVD based technique[5]. In author has proposed a blind and robust audio watermarking technique combined with SVD, DCT and synchronization code technique achieves very low error probability rates. With traditional and SVD based algorithms show better performance from our algorithm[6]. In to improve the quality of watermark image using different techniques of optimal robust image watermarking techniques based on SVD and the robustness of the embedded watermark against various attacks[7]. In author has proposed SVD-based watermarking scheme a good performance of the proposed scheme both in robustness and security can be achieved[8]. In author has proposed watermarking method was combines the SVD and DCT. It was should achieve the highest possible robustness without degrading image quality[9]. In author define based on MPEG-2 video watermark scheme it can achieved imperceptible and good robustness to MPEG-2 videos and security of watermark[10]. In author has proposed a practical video watermarking technique on the compressed domain it was satisfying real-time requirements and is robust to protect the copyright of HD video contents[11]. In author has proposed blind MPEG-2 video watermarking achieved high video quality and robustness to camcorder recording and other attacks. Embedding capacity of the proposed method has been computed which is better than the most cases compared to the existing methods. The MSE and PSNR value is also better than existing methods after embedding of secret image in various coefficients of the cover image[12].

Video watermarking describes the process of embedding information in video data. Different data hiding terminologies. The important terminologies pertaining to digital video watermarking are: Digital Video: Video sequence is a collection of consecutive and equally time spaced still images. Payload: It is the amount of information that can be stored in a watermark. An important concept regarding the video-watermarking payload is watermark granularity. Watermark granularity can be defined as how much data is required for embedding one unit of watermark information. Perceptibility: video watermarking methodology is called imperceptible if humans cannot distinguish between the original video from the video with inserted watermark. Robustness: a fragile watermark should not be robust against intentional modification techniques, as failure to detect the watermark signifies that the received data is no longer authentic. In case of application such as copyright protection, it is desirable that watermark always remains in the video data, even if the video data is subjected to intentional and unintentional signal processing attacks. Hence, depending on the requirements of the application the watermark is embedded in a robust, semi-fragile or fragile manner. Security: the security of the watermarking algorithm is ensured in the same way as in encryption methodology. According to the Kirchhoff's assumption, the algorithm for watermark embedding can be considered to be public, whereas the security depend solely on the choice of a key from a large key space

III. PROPOSED SYSTEM

The proposed technique is a combined algorithm of four different techniques, discrete wavelet transform, discrete cosine transform, fast fourier transform and singular value decomposition. Using this technique effectiveness of watermarking for imperceptibility and robustness will be verified by applying various signal processing and geometric attacks. After applying the attacks, performance of watermarked video frames will be evaluated by calculating PSNR(peak signal to noise ratio).

Provide the input video file and provide logo and text message for hiding data into Video. The process of system is to collect necessary input from user and Encode the data into Video and Generate Watermark Video Similar to Input Video. When user wants to decode it then user needs to provide watermark video file and security key which is already used for encoding process. System validate watermark video and security key of user and decode the message from the video which is called as extracted data from the video. It is more secure

3.1 Embedding Process

In the embedded process video file we have taken the frame I and apply SVD. Insert a logo and take DWT on both I-frame with logo and QR code image was composite with DWT co-efficient.to access watermark image we can apply IDWT. Finally

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Volume 4, Issue 4, April 2017

watermarked I-frame add in a video file. The schematic representation of extracting process.

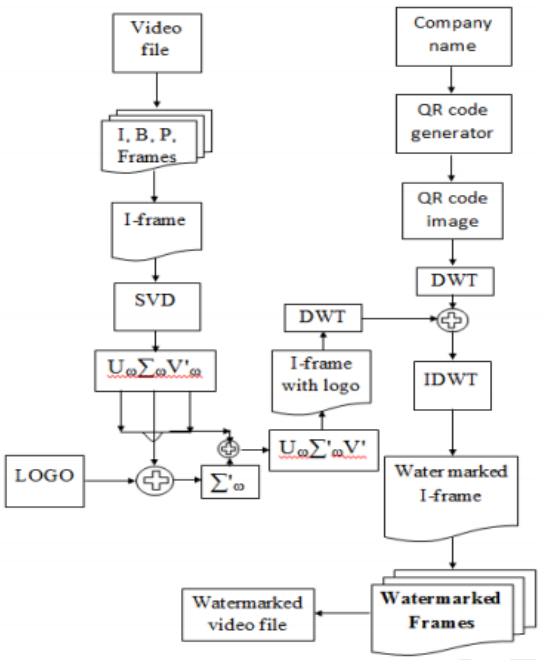

Figure 2. Shows the proposed embedded process.

Algorithm for Embedding Process

Step 1: Read the video file and extract RGB P-frame, B-frame, and I-frame.
Step 2: Read the I-frame image as a cover image.
Step 3: Generate a QR code image with company name.
Step 4: Apply SVD to I frame and get three singular coefficients as u, ∑, v' Step
5: Add logo with components of an SVD image to get an SVD cover image
Step 6: Apply DWT on both SVD cover image and QR code image to get combined image
Step 7: Take the inverse DWT on the combined image to get Watermarked I frame
Step 8: Finally watermarked I frame image to get the watermarked video files.

3.2 Extracting Process

In this process to watermarked image and access the logo by applied SVD.DWT apply on digital video, and I frame image extract form wavelet, take the IDWT for access the QR code image. Finally extract the verification text. The schematic showing the extract process.

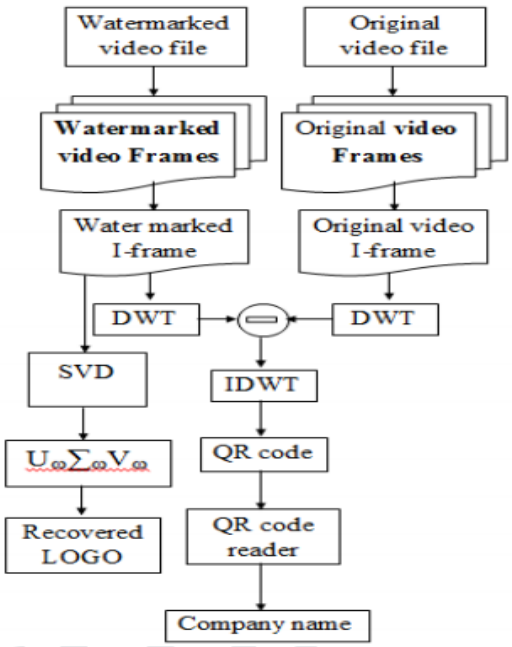

Figure 3 Block diagram of the extracting process

Algorithm for Decoding Process

Step 1: access the watermark video file and extract from watermark I Frame.
Step 2: Read the original video file and extract original Video I frame.
Step 3: Apply DWT on both videos I frame.
Step 4: Subtract watermarked video I frame coefficient with original video I frame coefficient and take Inverse DWT to get a QR code image.
Step 5: By using QR code reader extract company name From QR code image.
Step 6: Apply SVD on watermarked I frame to recover the logo by using the singular value component.

1. Experimental Result

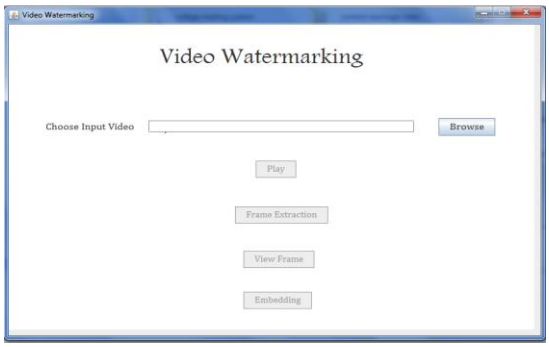

Fig.1. Select Image
User have to select one of the image.

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Volume 4, Issue 4, April 2017

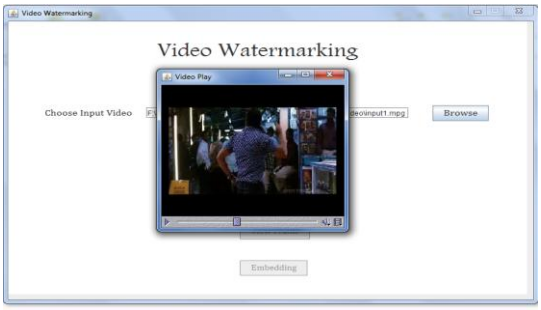

Fig.2 Select Image for apply watermark
Play the video before embedded.

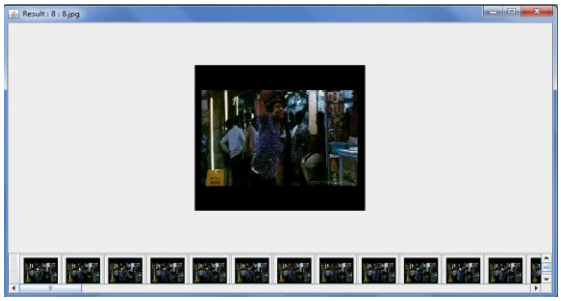

Fig.3. Apply Watermarking
Extract frames for the watermarking.

Fig.4. Logo Generated
Logo and OR Code of text is generated.

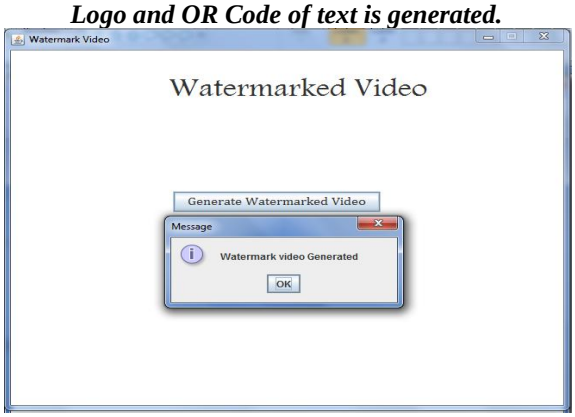

Fig.5. Watermarking Apply Successfully.

Watermarking applying for the video successfully.

IV. CONCLUSION

This method has achieved the improved reliable and secure watermarking. In this QR code encoding process and achieved best performances. In the first method watermark was in build in the dimensional element. And the other side text messages in the QR code image. So, the dual process given two authentication detail. The logo is located very safely in the QR code image. This method is convenient, feasible and practically used for providing copyright protection. Experimental results show that our method can achieve acceptable certain robustness to video processing.

REFERENCES

[1] Suppat Rungraungsilp, Mahasak Ketcham, Tanee Wiputtikul, Kanchana Phonphak, and Sartid Vongpradhip,"Data Hiding Method for QR Code Based on Watermark by comparing DFT with DWT Domain" ICCCT', May 26-27, 2012.

[2] Thitapa Poomvichid, Pantida Patirupanusara and Mahasak Ketcham, " The QR Code for Audio Watermarking using Genetic Algorithm", IMLCS'2012, pp 11-12, 2012.

[3] Shanjun, Zhang; Kazuyoshi, Yoshino,"DWT-Based Watermarking Using QR Code" Science Journal of Kanagawa University, pp3-6, 2008.

[4] Ray-Shine Run,Shi-Jinn Horng,Jui-Lin Lai,Tzong-Wang Kao, Rong-Jian Chen," An improved SVD-based watermarking technique for copyright protection", Expert Systems with Applications 39,2012,pp-673–689.

[5] Ahmad A. Mohammad, Ali Alhaj, Sameer Shaltaf," An improved SVD-based watermarking scheme for protecting rightful ownership" Signal Processing , Vol-88, 2008, pp: 2158– 2180.

[6] Bai Ying Lei n, IngYannSoon, ZhenLi," Blind and robust audio watermarking schemes based on SVD–DCT" Signal Processing, Vol-91, 2011, pp-1973–1984.

[7] Veysel Aslantas." An optimal robust digital image watermarking based on SVD using the differential evolution algorithm" Optics Communications, Vol-282, 2009, pp-769–777.

[8] Chin-Chen Chang a, Piyu Tsai b, Chia-Chen Lin, 2008". SVD-based digital image watermarking scheme." Patter Recognition Letters, Vol-26, 2005, pp-1577–1586.

ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Volume 4, Issue 4, April 2017

[9] Fangjun Huang, Zhi-Hong Guan "A hybrid SVD-DCT watermarking method based on LPSNR "Pattern Recognition Letters Vol-25, 2004, pp-1769–1775.
[10] Ming Jianga, b, Zhao-Feng Mao, b, Xin-xin Niua, Yi-Xian Yang," Video Watermarking Scheme Based on MPEG-2 for Copyright Protection" in International Conference on Environmental Science and Information Application Technology ESIAT 2011, Procedia Environmental Sciences, Vol-10, 2011, pp-843 – 848.
[11] Min-Jeong Lee,Dong-Hyuck Im, Hae-Yeoun Lee,KyungSuKim,Heung-Kyu Lee "Real-time video watermarking system on the compressed domain for high-definition video contents: Practical issues" Digital Signal Processing,vol-22, 2012,pp-190–198.
[12] He Yingliang, Yang Gaobo, Zhu Ningbo" A real-time dual watermarking algorithm of H.264/AVC video stream for Video-onDemand service "Int. J. Electron. Commune. (AEÜ), Vol-66, 2012, pp-305–312.
[13] Dooseop Choi, HoseokDo, HyukChoi, TaejeongKim,"A blind MPEG-2 video watermarking robust to camcorder recording", Signal Processing , Vol-90, 2010, pp-1327–1332.