Scientific Journal of Impact Factor (SJIF): 5.71

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 5, Issue 04, April -2018

AN EFFICIENT WATERMARKING FRAMEWORK OF AVI VIDEOS USING DCT TECHNIQUE

Mrs.I.Varalakshmi[1], Priyadharshini.N[2], M.Priyalakshmi[3], V.Sindhuja[4]

[1]*Assistant Professor, Department of Computer Science and Engineering, Manakula Vinayagar Institute of Technology,*
[2,3,4] *B.Tech, Department of Computer Science and Engineering, Manakula Vinayagar Institute of Technology*

Abstract — *Digital watermarking is a data hiding technique where an information or message is hidden inside a signal transparent to the user. Video Watermarking is one of the interesting fields to develop a system with authentication and copyright protection methodology embedded within an efficient video codec. Thus, this technique can be used for copyright protection, piracy tracing, content authentication, advertisement surveillance, error resilience, and so forth. In this paper, we give an overview on video watermarking technology, including its properties, applications, performance requirements, typical algorithms, and comparison among them. As the advanced mixed media are coordinated by means of the system, expansive measure of information is exchange effortlessly and winding up quicker, less demanding, and require less effort to make precise. This advance will profit sight and sound item proprietors as deals will increment. The significant hindrance is the absence of compelling licensed innovation insurance of advanced media to put off unapproved duplicating and appropriation. In this paper we propose Digital video watermarking plot in light of discrete cosine change additionally the Design of this plan utilizing Matlab 2014a. Watermarking procedure has been proposed as a strategy to shroud mystery data into the signs to demoralize illicit duplicating or then again validate the wellspring of the media.*

Keywords-*Video Watermarking, AVI(Audio Video Interleave), Embedding, Extraction, DCT (Discrete Cosine Transform) Technique*

I. INTRODUCTION

Video Watermarking is a young and rapidly evolving field in the area of multimedia. Following factors have contributed towards the triggering of interest in this field. a) The society is contaminated by the tremendous privacy of digital data, as copying of digital media has become comparatively easy. b) This is an era where need has arise for fight against "Intellectual property rights infringements". c) Copyright protection must not be eroded due to malicious attacks d) Tampering of the digital data needs to be concealed at some point. The requirement of secure communication and digital data transfer has potentially increased with the development of multimedia systems. Data integrity is not secure in image transfers. The main technique used for protection of an Intellectual Property rights and copyright protection is digital water marking. The copyright data may be in the form of text, image, audio, and video [1, 2, 3]. Watermarking may be visible or invisible. Invisible watermarking implies that the presence of the watermark is barely discernible when the watermarked signal is displayed. There are several techniques for information hiding into digital media. They are used for several purposes as well as copyright protection. Two basic methods of information hiding are cryptography and steganography. The concept of digital watermarking is derived from steganography. The term steganography means "cover writing" and cryptography means "secret writing". Cryptography is a widely used method for protecting the digital content of the media. The message is encrypted before transmission and decrypted at the receiver end with the help of a key. No one can access the content without having the true key. The message is called the plain text and the encrypted message is called the cipher text. The information is protected before the time of transmission. But, after decryption, the information becomes unprotected and it can be copied and distributed. In steganography, the message is embedded into the digital media rather than encrypting it in such a way that nobody except the sender and the intended recipient can even realize that there is a hidden message. The digital media content, called the cover, can be determined by anybody; but, the message hidden in the cover can be detected by only the person having the actual key. Thus steganography actually relates to covering point-to-point communication between two parties. That's why steganography methods are usually not robust against modification of the data, or have only limited robustness. Watermark embedding may bring in diminutive distortion into the audible or visible components of the watermarked signal. If the watermark cannot be easily removed from the watermarked signal even after applying common watermarking attacks then it is referred as robust embedding. The basic components involved in robust watermarking are watermark embedding, attack, and watermark detection. In watermark embedding, a watermark signal (Text, image or audio etc) is constructed and then embedded into an original signal (Video) to produce the watermarked signal. Once embedding is done, the watermarked video can be subjected to various attacks. During watermark detection, the watermark detector is given a test signal that may be watermarked, attacked or not. The watermark detector reports whether the watermark is present or not on examining the signal at its input.

II. TECHNIQUES IN VIDEO WATERMARKING

Current video watermarking techniques can be grouped into two major classes; spatial-domain watermarking techniques and watermarking frequency-domain techniques. Spatial-domain techniques embed a watermark in the frames of a given video by modifying its pixels directly. These techniques are easy to implement and require few computational resources, however, they are not robust against common digital signal processing operations such as video compression. On the other hand, transform-domain watermarking techniques modify the coefficients of the transformed video frames according to a predetermined embedding scheme. The scheme disperses the watermark in the spatial domain of the video frame , hence making it very difficult to remove the embedded watermark. Compared to spatial-domain techniques, frequency-domain watermarking techniques proved to be more effective with respect to achieving the imperceptibility and robustness requirements of digital watermarking algorithms

III. MOTIVATION AND RELATED WORK

3.1 Motivation

As digital video based application technologies grow, such as Internet video, wireless video, video phones and video conferencing, the problem of unauthorized copying and distribution of digital video rises more and more, thus creating copyright dilemma for the multimedia industry and to the audio-video industry. Many researches and technologies were proposed methods to solve the problem of illegal copying and manipulation of digital video. An attractive method that has been proposed a decade ago to implement copyright information in multimedia document is digital watermarking.

3.2 Related work

In M. A. Gangarde ; J. S. Chitode, 2017 [1], a innovative video watermarking using Pixel Location Based Technique (PLBT) was proposed to improve the strength and imperceptibility of secret data. Here, the pixel values of selected frames of watermarked video with the obtained pixel values of secret watermark image is located and the offset values of selected frames is used as a secret key. The results confirmed the improvement in strength and imperceptibility of the secret data.

In Chunting Cai ; Gui Feng ; Chi Wang ; Xue Han, 2017 [2], reversible watermarking algorithm for High Efficiency Video Coding without error propagation was proposed. Here, the embedding region in 4x4 luminance prediction unit is selected to identify the bit rate. It uses a novel module for eliminating the error propagation and the results show that the algorithm has little influence on bit rate and the error propagation was eliminated.

IV. PROPOSED SYSTEM

A lot of watermarking methods have been proposed to improve both of these aspects. Extensive surveys dealing with video watermarking applications, attacks and methodologies can be found . Watermarking techniques can be broadly classified into three categories: spatial domain methods transform domain methods and compressed domain methods . Spatial domain methods insert the watermark information in the luminance and/or chrominance values of the pixels. Transform domain methods use the Discrete Cosine Transform (DCT) , Discrete Fourier Transform (DFT) or the wavelet domain for watermark embedding. Among these techniques, the ones based on the Discrete Cosine Transform (DCT) are gaining more popularity due to their excellent spatial localization, frequency spread, and multi-resolution characteristics. For these reasons, the proposed method also works in the DCT domain. Watermarking schemes performed in the compressed domain include those for MPEG 1-4 and H.26 compressed videos. Such methods usually embed the watermark directly into the VLC code by modifying the transform domain coefficients or the motion vector information.

The work presented in this study consists of four major modules

- Video process
- Image process
- Embedding process
- Extraction process

4.1 Video process

The original AVI (Audio Video Interleave) video where the watermarking is to be embedded is selected. Further, this original video is converted to a grayscale video thereby to reduce the complexity of watermarking during watermarking process. The grayscale video is now converted into number of frames to identify a particular block where the secret image is to be watermarked. Then by applying DCT (Discrete Cosine Transform) the coefficients of the video is identified.

4.2 Image Process

In this image process the secret image which is to be watermarked is selected. As like of video process, here the image is also converted into grayscale. Then DCT is applied to that image to obtain the coefficients of the image.

4.3 Embedding process

The secret image is embedded into a particular block of the AVI video thereby enhancing secuity and robustness. After embedding the image into video IDCT (Inverse Discrete Cosine Transform) is applied.

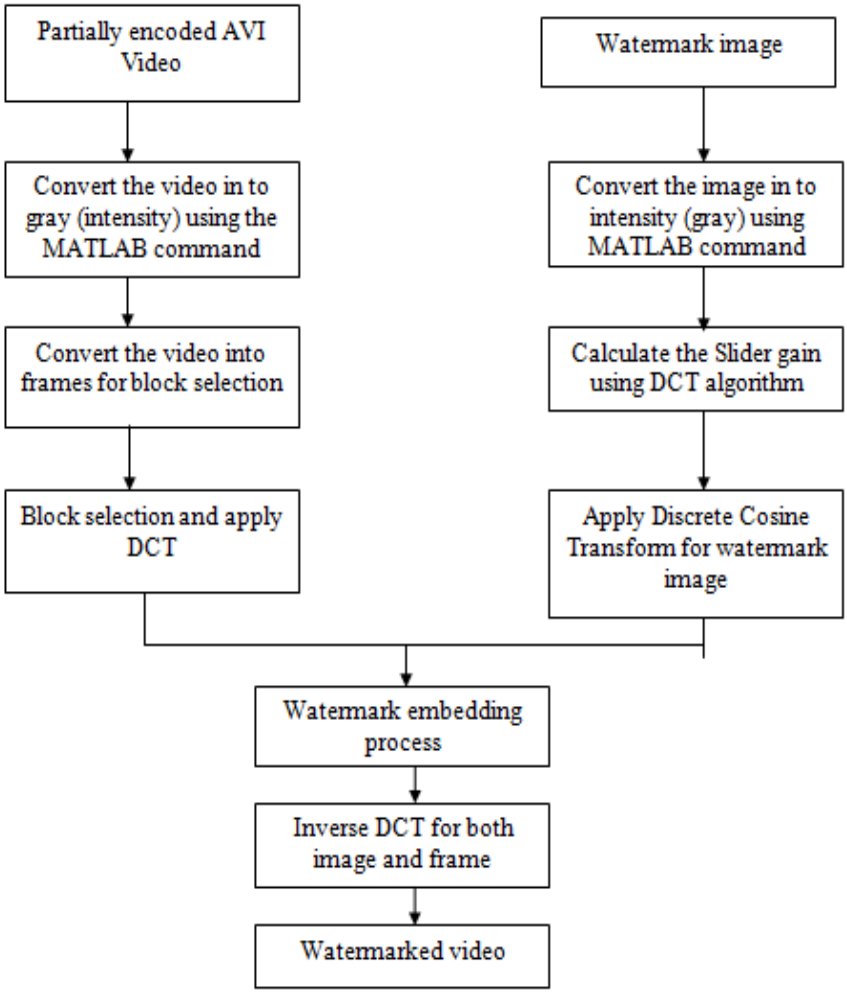

Figure 1. Embedding process

4.4 Extraction process

The secret image that was watermarked into the AVI video can be extracted in this process. Here the watermarked video is first converted into frames and the block where the image have been watermarked is identified and then by applying IDCT the secret image in gray scale is extracted.

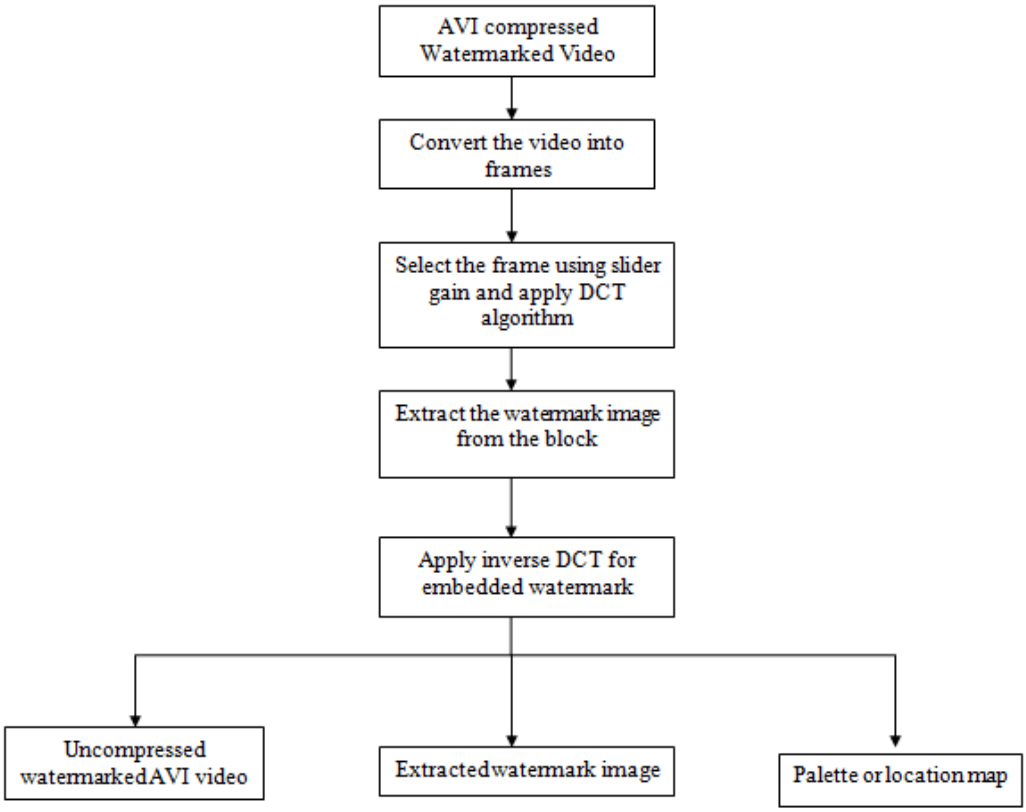

Figure 2. Extraction process

V. EXPERIMENTAL RESULTS

5.1 Video Process

The video process consists of video selection, converting the video into intensity image, block processing, and applying DCT. These steps are shown in figure 3.

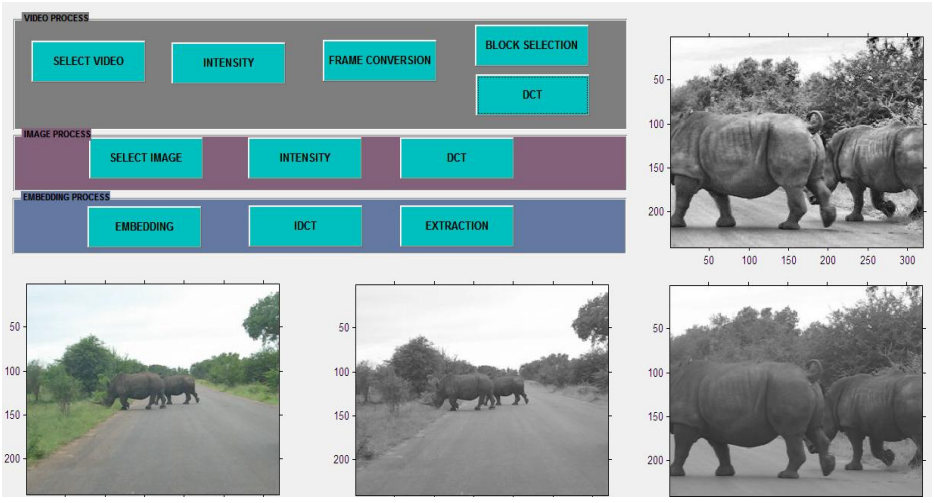

Figure 3. Video process

5.2 Image process

The steps that are involved in this process are as follows: image selection, converting the image into intensity, and then apllying DCT to the image. These steps are shown in figure 4.

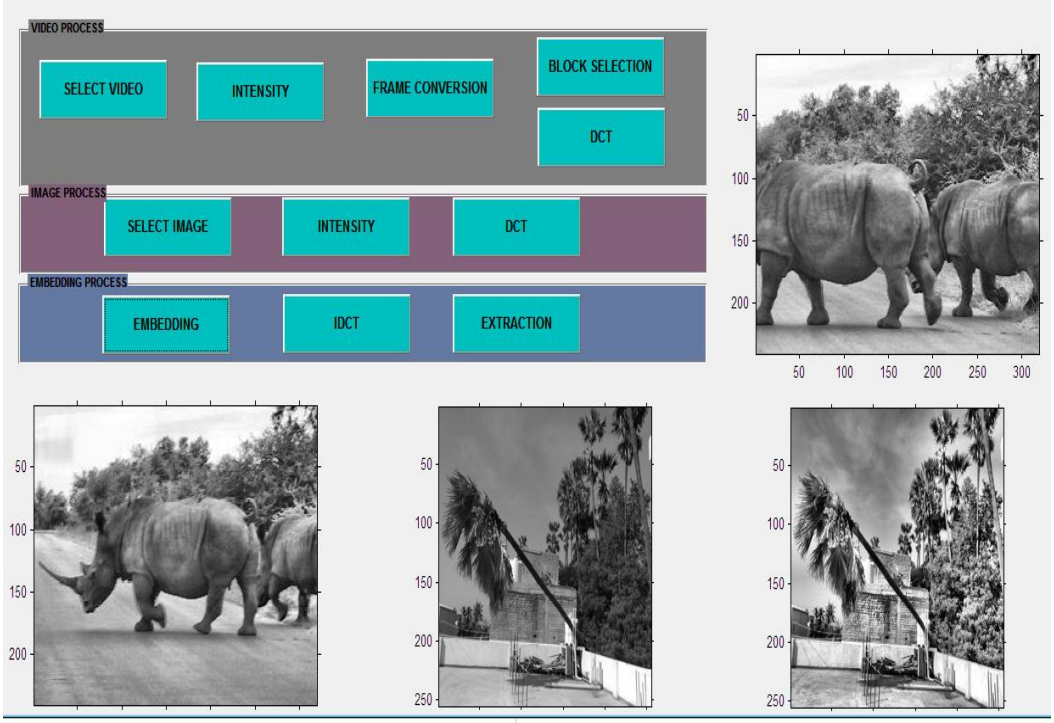

Figure 4. Image process

5.3 Embedding process

Embedding process consists of two steps: embedding and applying IDCT which is shown in figure 5.

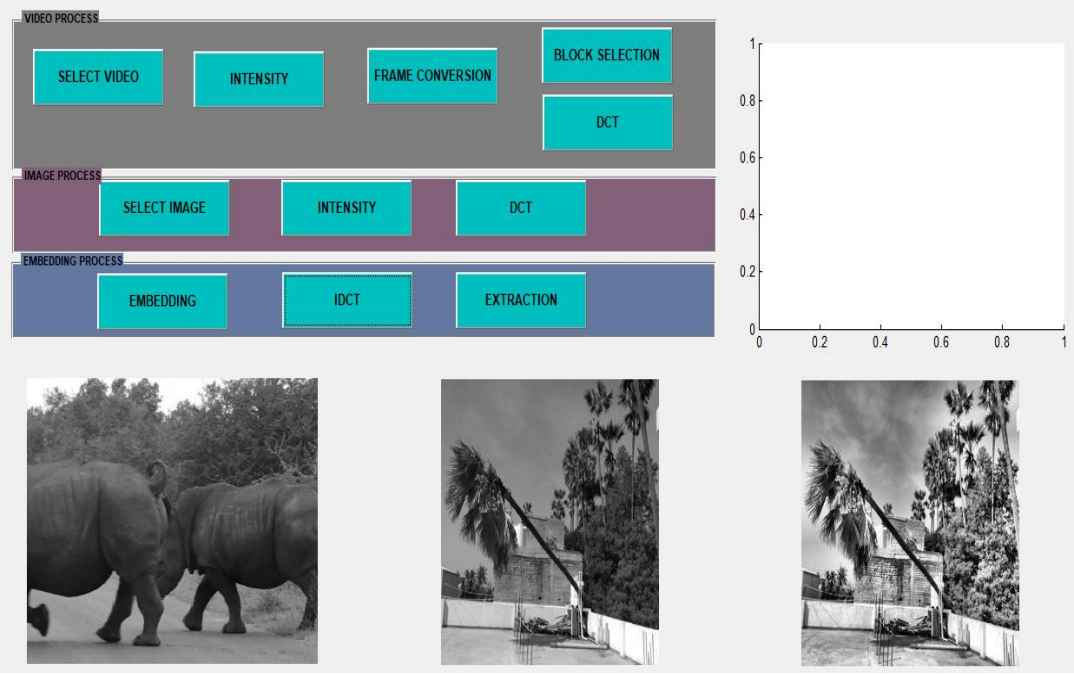

Figure 5. Embedding process

5.4 Extraction process

The extraction process consists of the watermarked video, frame conversion, block processing, applying of DCT, original video extraction and applying IDCT to get the secret image. These steps are shown in figure 6.

Figure 7. Extraction process

VI. CONCLUSION

The result shows that the proposed algorithm has a strong ability to resist different watermark attacks. DCT based video watermarking method gives the robust results for watermarking. We can apply different attacks on watermarked video and check the robustness of proposed method with comparing it with other video watermarking methods. It can be used for more robustness, where watermark can be scrambled into different parts and each part can be embedded into different set of frames using different techniques. So that even if video is attacked then one of the techniques will be able to resist that attack and whole watermark will not be damaged and some part of the watermark can be used for authentication and security. Here, We used .avi video as a input file, In future we can go with mp4 or HD file. Also we have used matlab 2014a software, In future we can do video watermarking with updated version.

VII. REFERENCES

[1] Application of crypto-video watermarking technique to improve robustness and imperceptibility of secret dataM. A. Gangarde ; J. S. Chitode, 2017.
[2] A reversible watermarking algorithm for high efficiency video coding Chunting Cai ; Gui Feng ; Chi Wang ; Xue Han, 2017.
[3] G. Langelaar, I. Setyawan, and R. Lagendijk, "Watermarking Digital Image and Video Data: A State-of Art Overview," IEEE Signal Processing Magazine, vol. , pp. 20-46, Sep. 2000.
[4] G. Doerr and J. Dugelay, "A Guided Tour to Video Watermarking," Signal Processing: Image Communication, vol. 18, pp. 263-282, 2003.
[5] D. Kundur, K, Su, and D. Hatzinakos, "Digital Video Watermarking: Techniques, Technology, and Trends," in Intelligent Watermarking Techniques , chapter 10, P. Pan, H. Huang, and L. Jain, eds., World Scientific Computing, pp. 265-314, 2004.
[6] H. Hartung and B. Girod, "Watermarking of Compressed and Un-Compressed Video," Signal Processing, vol. 66, no. 3, pp. 283-301, May 1998. Cox, I. J., Miller, M. L., and Bloom, J. A. Digital Watermarking. Morgan Kaufmann Publishers, San Francisco, CA, 2002, pp. 26–36
[7] M. Rehan et al, A New Motion-Estimation Technique for Efficient Video Compression, IEEE Pacific Rim Conference, No. 1, pp. 326-330, 1997.
[8] H. Andrews and C. Patterson, "Singular Value decompositions and Digital Image Processing," IEEE Trans. on Acoustics, Speech, and Signal Processing, vol. 24, no. 1, pp. 26-53, Feb. 1976.
[9] P. Chan and M. Lyu, "A DWT-Based Digital Video Watermarking Scheme with Error Correcting Code," in Proceedings of the 5th International Conference on Information and Communications Security, 2003, pp. 202- 213.
[10] X. Niu and S. Sun, "A New Wavelet-Based Digital Watermarking for Video," in Proceedings of the 9th IEEE Digital Signal Processing Workshop, 2000, pp. 241-245.
[11] S. Voloshynovskiy, S. Pereira, and T. Pun, "Attacks on Digital Watermarks: Classification, Estimation-Based Attacks, and Benchmarks," Comm. Magazine, vol., pp. 118-126, Aug. 2001.
[12] E. Ganic and A. M. Eskicioglu, "Secure DWT-SVD Domain Image Watermarking: Embedding Data in All Frequencies," ACM Multimedia and Security Workshop 2004, Magdeburg, Germany, September 20-21, 2004.

