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Robust QR Code Video Watermarking

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ABSTRACT: Nowadays, on the internet digital video is popular multimedia data exchanged. To improve security media required the protection as it was commercial activity on internet. Hence in the security field 2D barcode is more interesting research on the internet. In these studies we proposed video watermarking with text massage (Verification Massage) by using Quick response Code (QR Code) technique. The QR Code is prepared to be watermarked via a robust video watermarking scheme based on the (singular value decomposition) SVD and (Discrete Wavelet Transform) DWT. With help with watermarking we can gives copyrights of these video document. For watermarking applications SVD is an attractive algebraic transform. SVD is applied to the cover I-frame. The extracted diagonal value is fused with logo (or) watermark. DWT is applied on SVD cover image and QR code image. The invers transform of watermarking image and add the frame into video with logo and QR code image send these video file to authorized user. In the reverse process check the logo and QR code for authorized ownership. It can be achieved acceptable imperceptibility and certain robustness in video processing.

KEYWORDS: 2D Barcode; Quick Response (QR) Code; singular value decomposition (SVD); Discrete Wavelet Transform (DWT).

I.INTRODUCTION

The work of this steganography is access private information into data under the assumption of others users not aware of this private information. The main work of watermarking to check the logo will be embedded in data or not. Based on the type of document to be watermarked.

A. Text Watermarking: Word shift coding, feature coding, Line shift coding.

B. Visible Watermark: In this watermark information can be visible in the video.

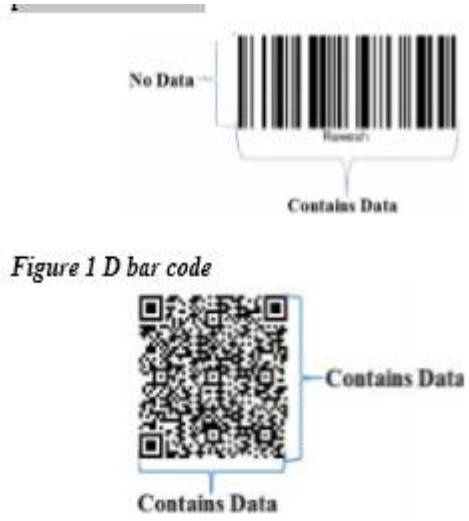

Figure 1 D bar code

Fig. 1. 1 D Bar Code

Normally this information is appear in some text or logo which is identifies owner of media.

C. Invisible Watermark: In that method text and logo will be hide which not seen but it will be detected by algorithms.

D. Dual Watermarking: In this method used combination of visible watermark and invisible watermark.to store backup of visible watermark we used invisible watermark. It can be used to verify ownership.

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A quick response (QR) code is a two dimensional barcode invented by the Japanese corporation Denso Wave. In QR code store the information vertically and horizontally direction hence it will be stored hundred time more data as compare to traditional bar code. In QR Codes contain a large amount of information than 1D barcode. QR Code can encode in many types of characters such as numeric, alphabetic character, Kanji, Kana, Hiragana, symbols, binary, and control codes.

II.RELATED WORK

Author has proposed by using DFT compare with DWT QR Code embedded technique for invisible watermarking.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 [2] author has define by using QR code hiding audio based data and for achieved this technique's quality used AI technique was watermark image and the sim value of the extracted watermark after certain attack will be poor. The robust performance can be achieved. In [3] 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 .In [4] author has proposed reliable SVD-based image watermarking. It was solving the critical situation and false positive problem and get PSNR value. In [5] author has proposed SVD based watermarking algorithm for ownership protection. This techniques is more robotic and solve false positive flow in SVD based technique. In [6] 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. In [7] 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. In [8] author has proposed SVD-based watermarking scheme a good performance of the proposed scheme both in robustness and security can be achieved. In [9] author has proposed watermarking method was combines the SVD and DCT. It was should achieve the highest possible robustness without degrading image quality. In [10] author define based on MPEG-2 video watermark scheme it can achieved imperceptible and good robustness to MPEG-2 videos and security of watermark. In [11] 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. In [13] 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.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.

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III.PROPOSED ALGORITHM

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

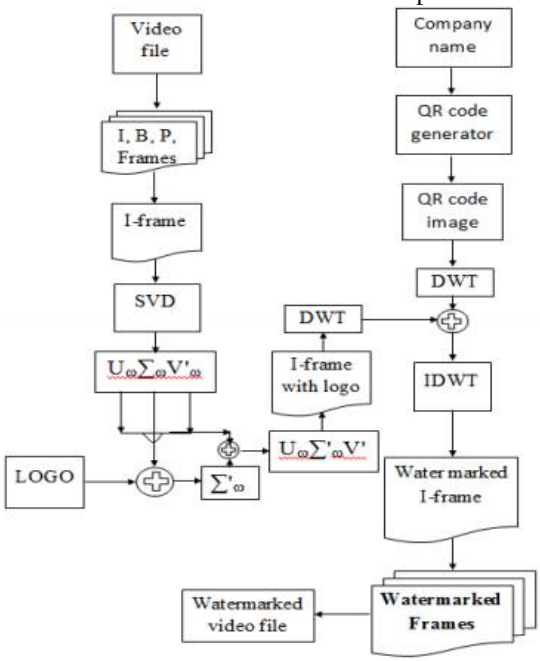

Fig. 2proposed embedded process.

B. 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.

C.Algorithm for 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.

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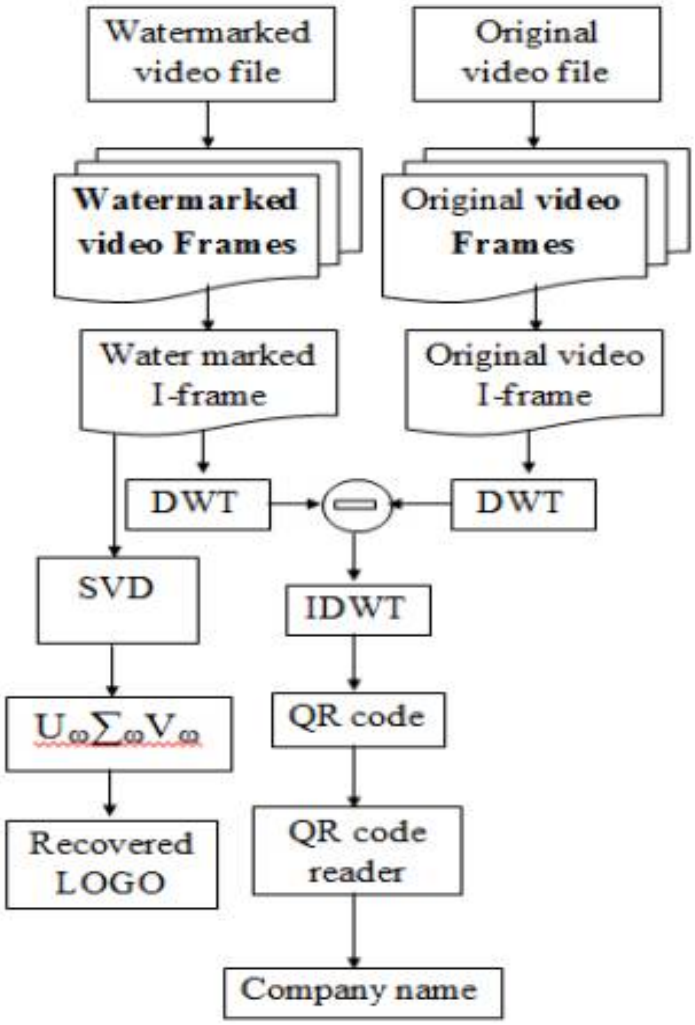

Fig. 3 proposed extracting process.

D. 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.

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IV.EXPERIMENTAL RESULTS

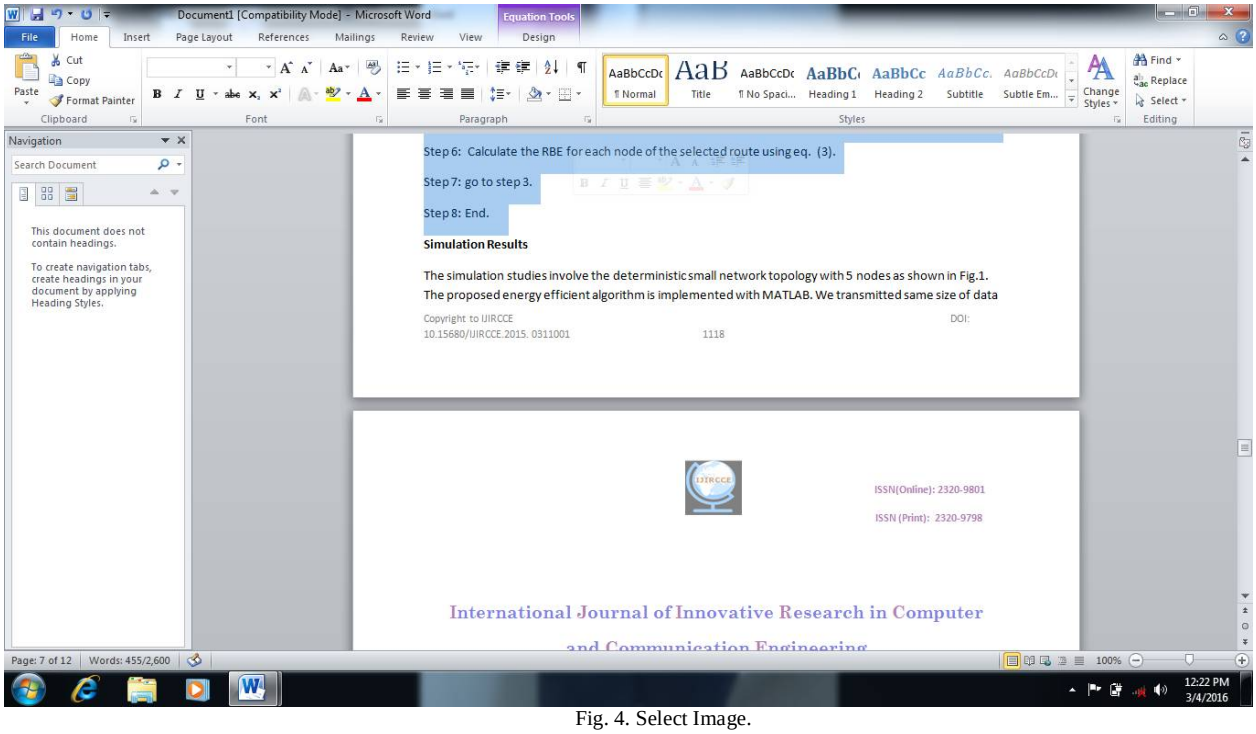

Fig. 4. Select Image.

User have to select one of the image.

Fig. 5. Select Image for apply watermark.

Play the video before embedded.

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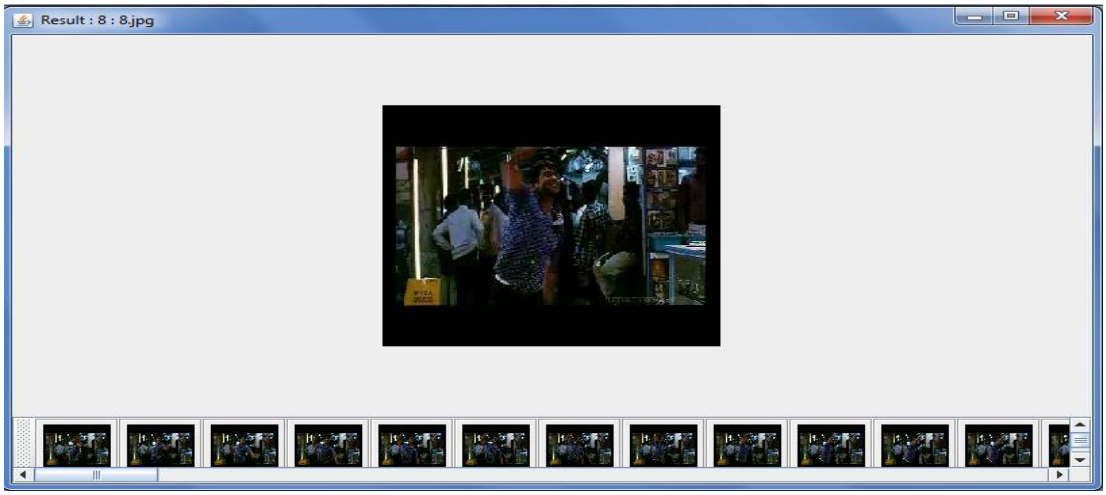

Fig. 6 . Apply Watermarking .

Extract frames for the watermarking.

Fig. 7 Logo Generated.

Logo and OR Code of text is generated.

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Fig. 8. Watermarking Apply Successfully.

Watermarking applying for the video successfully.

V. CONCLUSION AND FUTURE WORK

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.

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BIOGRAPHY

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