ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 7, Issue 5, May 2019

QR Code Based Watermarking Technique

Atul Walse[1], Priyanka Pandey[2], Rupesh Kumbhakarna[3], Reynold Joseph[4], Prof. Vajid Khan[5]

U.G. Student, Department of Computer Engineering, DYSOET, Pune, India[1, 2, 3, 4]

Assistant Professor, Department of Computer Engineering, DYSOET, Pune, India [5]

ABSTRACT: Nowadays, Digital video is one of the popular multimedia data exchanged in the internet. Commercial activity on the internet and media require protection to enhance security. The 2D Barcode with a digital watermark is a widely interesting research in the security field. In this paper propose a video watermarking with text data (verification message) by using the Quick Response (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. In addition to that logo (or) watermark gives the authorized ownership of video document.SVD is an attractive algebraic transform for watermarking applications. 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 inverse transform on watermarked image and add the frame into video this watermarked (include logo and QR code image) the video file sends to authorized customers. In the reverse process check the logo and QR code for authorized ownership. These experimental results can achieve acceptable imperceptibility and certain robustness in video processing.

KEYWORDS: Watermarking, 2D Barcode, Quick Response (QR) Code; Singular Value Decomposition (SVD); Discrete Wavelet Transform (DWT)

I. INTRODUCTION

The main idea of steganography is the embedding of secret information into data under the assumption that others cannot know the secret information in data. The main idea of watermarks is to check the logo embedded in data or not. Based on the type of document to be watermarked, Text Watermarking: Line shift coding, word shift coding, feature coding. Visible Watermark: The information is visible in the picture or video. Typically, the information is text or a logo which identifies the owner of the media. Invisible Watermark: An invisible watermark is an overlaid image which cannot be se en, but which can be detected algorithmically. Dual Watermarking: Dual watermark is a combination of a visible and an invisible watermark. In this type of watermark, an invisible watermark is used as a backup for the visible watermark. It can be used to verify ownership. A quick response (QR) code is a two dimensional barcode invented by the Japanese corporation Denso Wave. Information is encoded in both the vertical and horizontal direction, thus holding up to several hundred times more data than a traditional bar code (figure 2). QR Codes holds a considerably greater volume of information than a 1D Barcode (figure 1). QR Code can encode in many types of characters such as numeric, alphabetic character, Kanji, Kana, Hiragana, symbols, binary, and control codes.

II. LITERATURE SURVEY

BhavnaGoel et al. [1] presents a novel fast and robust video watermarking scheme for RGB uncompressed AVI video sequence in discrete wavelet transform (DWT) domain using singular value decomposition (SVD). For embedding scene change detection is performed. The singular values of a binary watermark are embedded within the singular values of the LL3 sub-band coefficients of the video frames. The resultant signed video exhibits good quality. To test the robustness of the proposed algorithm six different video processing operations are performed. The high computed PSNR values indicate that the visual quality of the signed and attacked video is good. The low bit error rate and high normalized cross correlation values indicate a high correlation between the extracted and embedded watermark. Time complexity analysis shows that the proposed scheme is suitable for real time application. It is concluded that the embedding and extraction of the proposed algorithm are well optimized. The algorithm is robust and shows an improvement over other similar reported methods.

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 7, Issue 5, May 2019

IwanSetyawan et al. [2] propose a content - dependent spatio - temporal watermarking scheme for digital videos. Content dependency is achieved by incorporating the hash of the video sequence into the watermark. The video sequence is treated as a 3-dimensional spatio-temporal signal for the purposes of video hash computation and watermark embedding and detection. Our experiments show that the video hash algorithm has good discriminating power and robustness against various attacks. The watermark is also shown in the experiments to have good robustness against a variety of attacks, in particular when the watermark is copied from one video sequence to another.

Rituja S. Darandale et al. [3] describe one of the popular multimedia data exchanged in the internet is Digital video. Protection requires in requires enhancing safety in commercial activity on the internet as well as media. A widely interesting research is the 2D Barcode with a digital watermark is in the field of security. By using the Quick Response (QR) Code technique, in this paper we recommend a video watermarking with text data. Via a robust video watermarking scheme the QR Code is prepared to be watermarked based on the SVD (singular value decomposition) and DWT (Discrete Wavelet Transform). SVD is an attractive arithmetical transform for watermarking applications. In addition to that logo (or) watermark gives the authorized ownership of video document. For the cover I-frame the SVD is applied. With logo (or) watermark there fused the extracted diagonal value. For SVD cover image and QR code image the SVD is applied. The watermarked image inverse transform and add the frame into video, to authorized customers this watermarked video file sends. In the reverse process for authorized ownership check the logo and QR code. Acceptable imperceptibility achieved by these experimental results and in video processing there certain robustness.

KorAshwini N. et al. [4] describe due to development in digital image and internet technology common users can easily copy important data and produce illegal copies of image. So digital multimedia data exchange through internet is main idea which requires protection to enhance security, to resolve the copyright protection problem of various multimedia data and image, we propose different watermark technique used for data hiding by applying the QR Code technique. By using QR code we have propose DWT (Discrete-Wavelet-Transform), SWT (Stationary-Wavelet-Transform), SVD (singular-value decomposition) methodology for watermarking technique. The 2D barcode with a digital watermark is a widely interest research in security. The combination of DWT and SWT with SVD give better security, robustness and imperceptibility.

SupriyaHasarmani et al. [5] describe in modern years there is no difficulty to make perfect copies which guide extensive unauthorized copying, which is an immense concern to the film, music, software and book publishing industries. Because of this unease over copyright issues, many technologies are developed to defend against illegal copying. Use of digital watermarks is one of these technologies. Watermarking does the embedding an ownership signal into the data directly. So that, the signal is always present with the data (image, audio, video). DWTDFT-SVD techniques are used in the proposed scheme to improve the robustness and overall computation requirements. The proposed algorithm is tested using three video sequences of different format. In this approach achieved PSNR of the original and watermarked video signal is more than 60 dB. The proposed scheme shows high robustness against several attacks.

YuanfangGuo et al. [6] analyzed the expected performances and limitations of the EDHVW methods. Based on the analysis, we proposed a new general EDHVW method, Content aware Double-sided Embedding Error Diffusion, via considering the expected performances which is affected by the content of the cover images and watermark (secret pattern), the different noise tolerance abilities of different cover image content and the different importance levels of different pixels (when being perceived) in the secret pattern. To demonstrate the effectiveness of the proposed CaDEED, CaDEED-EC and CaDEED-N&I are proposed. CaDEED-EC considered the expected performances only. CaDEED-N&I exploited more by adopting the noise visibility function [47] and proposing the importance factor (IF) for different watermark pixels. In the experiments, the validation tests for CaDEED-EC and CaDEED-N&I were performed first. Then, after selecting the optimal local region sizes for CaDEED-N&I, extensive comparison tests were carried out. The performances were not only measured by the existing PSNR, SSIM and CDR measurements, but also measured by our proposed measurements, NTPSNR and CB-CDR, to further illustrate the significance of the proposed method. Both the numerical and visual comparisons indicated that our proposed work outperforms the classical and latest EDHVW method.

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 7, Issue 5, May 2019

III. PROPOSED SYSTEM

In the below block diagram describes user provide his input video file, text data and security key 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. Systems 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.

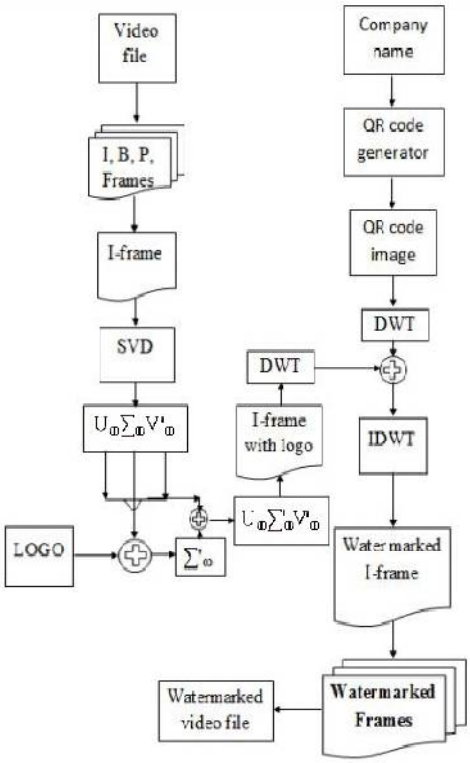

Fig 1: Proposed Embedded Process

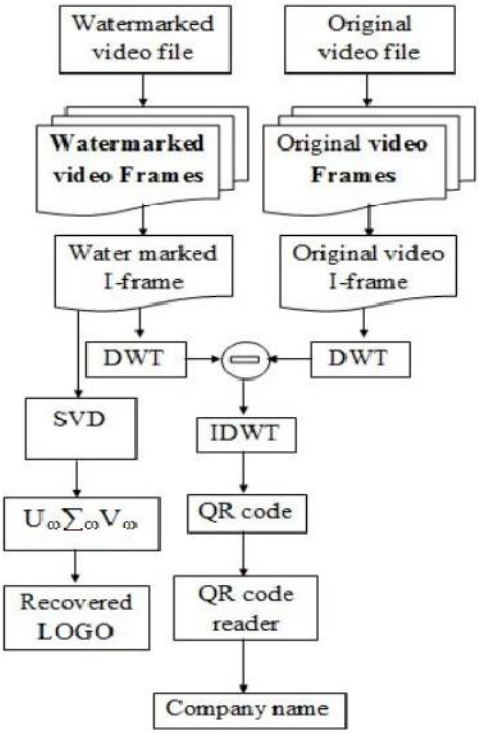

Fig 2: Block Diagram of the Extracting Process

Proposed the scheme to offer potential resolution for security and prohibiting copyright infringement of multimedia using video watermarks. This scheme has sustainable capability to withstand against a variety of attacks, influences the applications and its presentation in security of copyright and authentication.

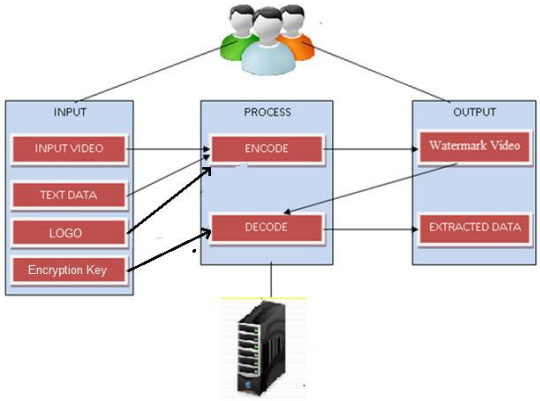

Fig 3: System Architecture

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 7, Issue 5, May 2019

IV. MATHEMATICAL MODEL

S= {I, P, O}

I= Input, P=Process, O= Output
I= {I0, I1, I2, I3}
I0= Provide logo to embed
I1= Provide video in .mpeg format
I2= Provide text to be hide in video
I3= Provide encryption key K_{128}

P= {P0, P1, P2, P3, P4, P5}
P0= Encrypt the text using AES algorithm
P1= Create QR code of encrypted text {P0…Pn}
P2= Extract frame from video {f0…fn}
P3= Find I frame to embed logo
P4= Hide data in I frame
P5= Extract logo and text from video

O= {O0, O1}
O0= Secure text message (m)
O1= logo hidden in video (l)

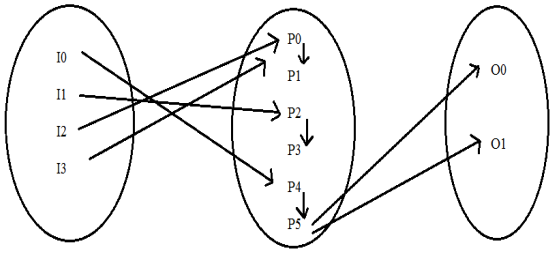

Fig 4: Venn diagram

V. RESULT

In proposed system, experiment needs to extract frames from video and get processed DCT and SVD algorithm to watermark the image with video. Frame extraction process needs time in seconds and it's totally depends on frame rate of video taken as input.

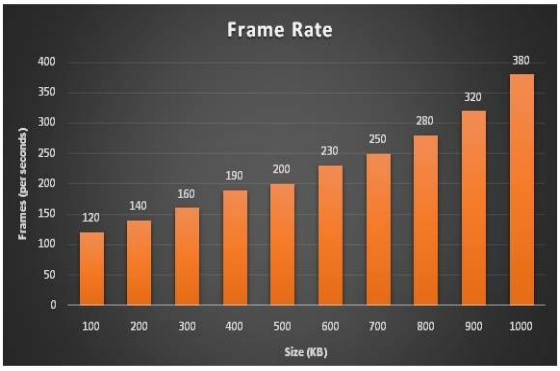

Fig 5: Frame Rate

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 7, Issue 5, May 2019

In our method, first select I frame for the GOP. The Fist frame of any group is I-frame and every 0.5 seconds I frame appears. The some of the video quality measurement has been illustrated in the figure 3. The video quality factors MAE, MSE, RMSE, and NCC other quality measurement are observed. The video quality of the proposed method has been completed, which is better than the most cases compared to the existing methods.

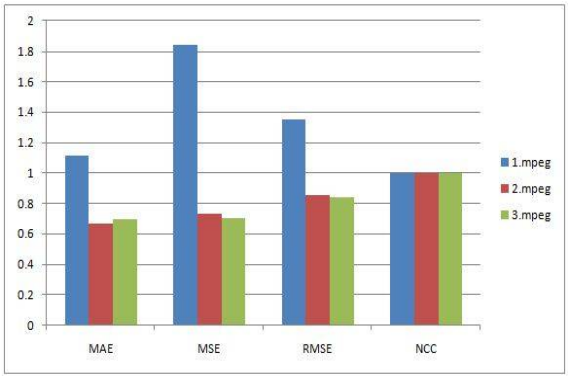

Fig 6: Comparison of Various Quality Measurements of Cover Frames with Watermark Image

VI. CONCLUSION & FUTURE SCOPE

This method has achieved the enhanced imperceptibility and protection watermarking. In this QR code encoding procedure and get outstanding performances. In the first technique watermark was embedded in the diagonal aspect. On the other hand embedding text messages in the QR code picture.So, the double procedure given two verification factors. The logo is situated very securely in the QR code picture. This method is suitable, feasible and practically used for providing copyright security. Experimental outcome show that our procedure can achieve acceptable certain robustness to video processing.

In future, this system to increase efficiency of system audio files can also add in videos.

REFERENCES

1. BhavnaGoel, CharuAgarwal, An Optimized Un-compressed Video Watermarking Scheme based on SVD and DWT, IEEE, 2013.
2. IwanSetyawan, Ivanna K. Timotius, Content -Dependent Spatio-Temporal Video Watermarking using 3 -Dimensional Discrete Cosine Transform, IEEE, 2013.
3. Rituja S. Darandale , Siddhi S. Kasabe , Tripti D. Chikhale, Video Watermarking Scheme Based On Robust QR-Code, International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, 2015.
4. KorAshwini N, N.M.Kazi, A Watermark Technique based on SVD and DWT composite Function with QR-code, International Journal of Application or Innovation in Engineering & Management (IJAIEM), 2014.
5. SupriyaHasarmani, MangalPatil, 3 P. R. Naregalkar, Digital Video Watermarking Using DWT-DFT Transforms and SVD Technique, International Journal of Computer Science and Network, Volume 4, Issue 6, December 2015.
6. YuanfangGuo, Oscar C. Au, Rui Wang, Lu Fang, Xiaochun Cao, "Halftone Image Watermarking by Content Aware Double-sided Embedding Error Diffusion", IEEE Transactions on Image Processing, 2018.
7. JantanaPanyavaraporn, ParamateHorkaew, "DWT/DCT-based Invisible Digital Watermarking Scheme for Video Stream", IEEE, 2018.
8. MdShahid and Pradeep Kumar, "Digital Video Watermarking: Issues and Challenges", International Journal of Advanced Research in Computer Engineering & Technology (IJARCET), 2018.
9. PragyaAgarwal, Arvind Kumar, AnkurChoudhary, "A Secure and Reliable Video Watermarking Technique", IEEE International Conference on Computer and Computational Sciences (ICCCS), 2015.
10. Venugopala P. S., Dr. H. Sarojadevi, Dr.Niranjan N. VaniBhat, "Video Watermarking by Adjusting the Pixel Values and Using Scene Change Detection", IEEE Fifth International Conference on Signals and Image Processing, 2014.