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. 6, Issue 10, October 2018

Video Watermarking by Content Aware Double Sided Embedding Error Diffusion

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ABSTRACT*:* The expected watermark decoding performance with specific content of the cover video and watermark, different noise tolerance abilities of various cover video content and the different importance levels of every pixel (when being perceived) in the secret pattern (watermark). To demonstrate the effectiveness of CaDEED, we propose CaDEED with expectation constraint (CaDEED-EC) and CaDEED-NVF&IF (CaDEED-N&I). CaDEED-EC considered the expected performances only. CaDEED-N&I exploited more by adopting the noise visibility function 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.

KEYWORDS*:* Watermarking, halftone visual watermarking, optimization, noise tolerance ability.

I. INTRODUCTION

Nowadays, Digital video is one of the popular multimedia data exchanged in the internet. Commercial 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 project we proposed 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 SVD and DWT. In addition to that logo (or) watermark gives the authorized ownership of video document. In this project mainly two processes, first embedding where original video is watermarked with verification message. Second, extracting process where embedded logo and verification is retrieved from the watermarked video.

II. LITERATURE SURVEY

1. **M. Mangaiyarkarasi, "A Novel Digital Blind Watermark Embedding Process Using Gain Control Tamper Detection Algorithm. 2016"**
   In this paper, The research presents an enhanced method such as Digital image watermarking based on Blind Gain control tamper detection (BFCT) algorithm which combines watermarking and Stenography methods to solve the problem of forgery detection applications. In the BFCT model, some of the new training features will be selected using the knowledge currently held by the system. Then, specific features will be extracted from selected training image features. The proposed methodologies performance is analyzed with real-world image databases those are downloaded from image database repository. The values are compared with several constrains such as number of

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dimensions versus objective, PSNR and BER. Based on the results generated this research concludes that accuracy increases compared to the previous method of Contourlet Domain algorithm

2. **Mehmet Utku Celik, "Hierarchical Watermarking for Secure Image Authentication With Localization. 2002"**
In this paper, we describe a new hierarchical fragile watermarking scheme based on the public key watermark by Wong [8]. The proposed method eliminates the vulnerabilities of the original scheme to VQ counterfeiting attack of Holliman and Memon [14]. As the attack effort is stepped up by using larger image blocks and larger image databases for the generation of counterfeit images, the hierarchical scheme gracefully sacrifices tamper localization accuracy while still detecting forgeries.

3. **Yun-fu liu, " Dot-diffused halftoning with improved homogeneity "**
In this paper, Formerly, ordered dithering mainly focuses on the threshold arrangements, and dot diffusion is implemented with the omnidirectional error diffusion as oppose to the typical error diffusion methods which diffuse the errors to specific orientations. In this study, the proposed dot diffusion utilizes the advantages from both ordered dithering and dot diffusion for a great visual quality and high processing efficiency. In addition, the proposed method enhances the spatial relationship among the processing orders in CT to significantly improve the homogeneity and smoothness of halftones. Specifically, an alternative approach on APSD calculation as opposite to the typical Bartlett's procedure is proposed to correctly reflect the property of halftone patterns. This approach is a good tool to highlight the periodic artifact of the halftone patterns. As documented in the experimental results, the proposed dot diffusion is substantially superior to the former dot diffusion and ordered dithering in terms of visual quality. Although the runtime of the proposed method is slightly slower than that of the cuttingedge OD, the proposed method with artifact-free property offers a great market potential. In contrast to those methods which do not offer parallelism property, the proposed method meets the demand of the practical industries. Particularly, the increasing on image resolution requires highly efficient processing and mass productivity. The proposed scheme can be a very good candidate to address these issues

4. **V. G. Ranjith, "Block truncation coding for cbir systems using halftoning based techniques in compressed images: a survey "**
In this paper, the Ordered Dither Block Truncation Coding is proposed to solve the problem of blocking effect inherent in BTC that causes severe perceptual artifact in high compression ratio applications. The Look up Table based dither array approach is proposed to significantly reduce the complexity in block truncation coding and enhance the efficiency of subjected CBIR systems. The proposed scheme is a very competitive approach for image retrieval application that use compressed images. The effective generation of image content descriptors using the dither based BTC from compressed images is a boon to CBIR systems catering large database of compressed images. The void and cluster halftoning combined with BTC improves the image quality while operated in high coding gain applications like CBIR systems.

5. **Syifak Izhar Hisham, "Authentication System for Medical Images Using Hilbert Numbering"**
In this paper, The proposed watermarking scheme capacity is high. It embeds all authentication data all over the image, regardless region-of-interest (ROI) or region-of-non-interest (RONI). This is to guarantee all data has authentication bits and recovery bits if one of the area is attacked or modified. The purpose is to ensure localization works at all data, as the fragility purpose is not to protect the data like robust watermarking, but to be alert with the altered location in the image. The Hilbert numbering methods shows that it is compatible to various types of images, color and grey-scale.

III. PROBLEM STATEMENT

Proposed the system to provide potential solution for protection and prohibiting copyright infringement of multimedia using video watermarks. This system has sustainable capability to withstand against various attacks, influences the applications and its performance in protection of copyright and authentication.

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IV. SYSTEM ARCHITECTURE

In the below architecture 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. 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.

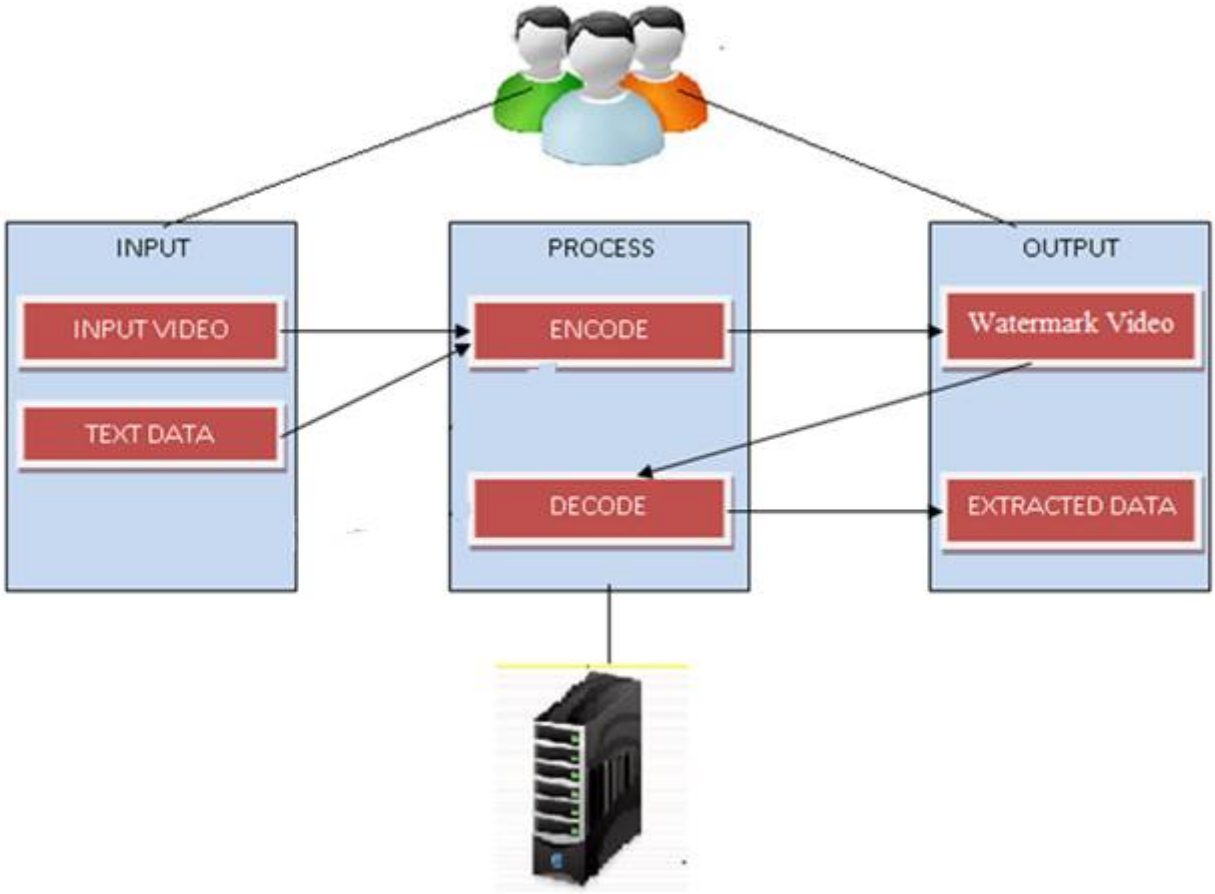

Figure1. System architecture

V. MATHEMATICAL MODEL

S= {I, P, O}
I= Input, P=Process, O= Output

I{I0, I1, I2,I3}
I0= Provide logo to embed

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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 algo.
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)

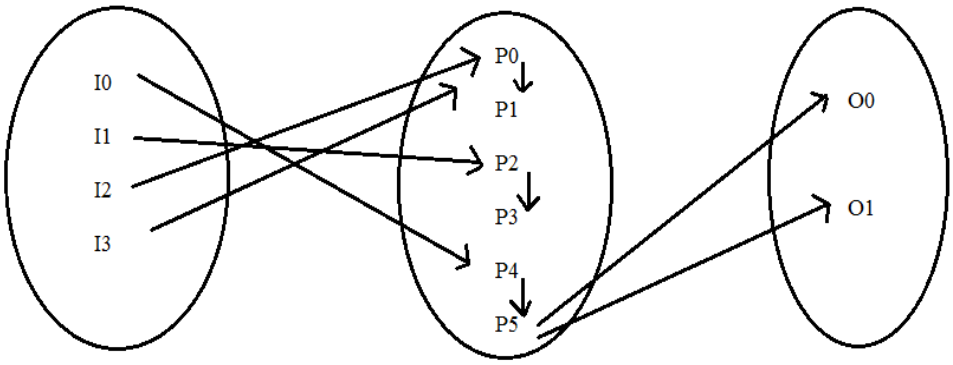

Fig. 2: Venn Diagram

VI. SYSTEM REQUIREMENT AND SPECIFICATION

- **Hardware Resources Required**
  1. System: Pentium IV 2.4 GHz.
  2. Hard Disk: 40 GB.
  3. Floppy Drive: 1.44 Mb.

- **Software Resources Required**
  1. Operating System: Windows 7 and above
  2. Programming Language: Java
  3. IDE: Net Beans

VII. CONCLUSION AND FUTURE WORK

This method has achieved the improved imperceptibility and security watermarking. In this QR code encoding process and get excellent performances. In the first method watermark was embedded in the diagonal element. On the other hand embedding 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

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copyright protection. Experimental results show that our method can achieve acceptable certain robustness to video processing.

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