A Modified Approach in Watermarked Image using Fractal Technology

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Abstract: *Now a day's means of communication refers to digitization of communication i.e. digital communication or digital media which can be in the form of Image, Audio, and Video. Since the digitization is making human life easier so take the security concern. The main issue is to make your life digital but with protection and highest security. In this paper we are going to implement our idea which concern about secure communication. For this we proposed an algorithm which will use video watermarking with a new technology called fractal technology. We will be using fractal images as watermarked images to make this work more effective since the fractal images is itself motion images it will be tough for unauthorized personal to breach the owner identification of copyright contents.*

Keywords: *Image watermarking, fractal, video frames Extraction, Audio Extraction, copyrights, Authentication.*

1. INTRODUCTION

In www that is world wide web there is a revolutionized way of digital data are to be distributed. Since the data is so much easy to user to use in a very easy y but at the same time second side of the coin say it will be also tough to maintain the integrity, security and protection. Many number of copy can be created to breach the security of any digital communication. To give a proper solution digital watermarking will work for the same. Widely used watermarking are exists in the digital world. There are a lot of watermarking schemes and approaches have been proposed by different researchers.

Figure 2. Fractal images

A watermark is a digital data embedded in multimedia objects such that the watermark can be detected or extracted at later times in order to make an assertion about the object. The main purpose of digital watermarking is to embed information imperceptibly and robustly in the host data. Typically the watermark contains information about the origin, ownership, destination, copy control, transaction etc. Potential applications of digital watermarking include transaction tracking, copy control, authentication. legacy system enhancement and database linking etc. [2] .Growing popularity of video based applications such as Internet multimedia, wireless video, personal video recorders, video-on-demand, set-top box, videophone and video conferencing have a demand for much higher compression to meet bandwidth criteria and best video quality as possible.

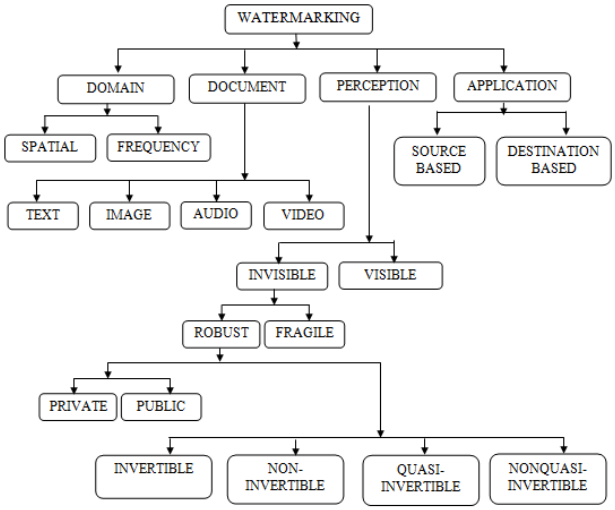

Figure1. Classification of existing watermarking schemes

Different video Encoder Decoders (CODECs) have evolved to meet the current requirements of video application based products. Among various available standards H.264 / Advanced Video Codec (AVC) is becoming an important alternative regarding reduced band width, better image quality in terms of peak-signal-to-noise-ratio (PSNR)and network friendliness [26], but it requires higher computational complexity. Apparently any image watermarking technique can be extended to watermark videos, but in reality video watermarking techniques need to meet other challenges than that in image watermarking schemes such as large volume of inherently redundant data between frames, the unbalance between the motion and motionless regions, real-time requirements in the video broadcasting etc. Watermarked video sequences are very much susceptible to pirate attacks such as frame averaging, frame swapping, statistical analysis, digital-analog (AD/DA) conversion, and lossy compressions.

2. LITERATURE SURVEY

Nitesh Shukla et al [] It has been observed that many numbers of researches has been done in field of digital video watermarking using transformation technique. Digital media protection and security is major concern in today's world because of explosion of data exchange on the Internet and the extensive use of digital media. In this paper, a comprehensive approach for managing robustness and security of video watermarking is introduced. We propose a digital video watermarking scheme based on combination transformation and pixel domain technique. For any reliable water marking Robustness and Fidelity are the major requirements. In pervious work, a robustness scene-based watermarking scheme is proposed. We focus on improving the fidelity at higher extent of scheme in this paper. The fidelity of the scheme is enhanced by applying using combination of our proposed and DWT watermarking algorithm, which optimizes the quality of the watermarked video. We have performed a series of experiments for effectiveness of this scheme.

As per the article Sourav Bhattacharya et al[1]. ,Last few years have witnessed rapid growth in video coding technology. Among various standards, H.264/Advanced Video Codec (AVC) is found to be of significant importance regarding reduced bandwidth, betterimage quality and network friendliness. One of the current fields of interest is to develop a system with authentication and copyright protection methodology embedded within an efficient video codec. In this paper we first perform a survey on available video watermarking techniques, feasibility study on watermarking techniques meeting application specific criteria for H.264/AVC and then we perform a comparative analysis based on robustness and computational complexity of different watermarking algorithms

As per Abdullah Bamatraf et al[2]. In this paper, we introduce a new digital watermarking algorithm using least significant bit (LSB). LSB is used because of its little effect on the image. This new algorithm is using LSB by inversing the binary values of the watermark text and shifting the watermark according to the odd or even number of pixel coordinates of image before embedding the watermark. The proposed algorithm is flexible depending on the length of the watermark text. If the length of the watermark text is more than ((MxN)/8)-2 the proposed algorithm will also embed the extra of the watermark text in the second LSB. We compare our proposed algorithm with the 1-LSB algorithm and Lee's algorithm using Peak signal-to-noise ratio (PSNR). This new algorithm improved its quality of the watermarked image. We also attack the watermarked image by using cropping and adding noise and we got good results as well.

Accroding toYusuf Perwej et al[3],Digital watermarking is a new method of protecting multimedia content from unauthorized copying. A digital multimedia technology has offered many facilities in the transmission, reproduction and manipulation of data. However, this advance has also brought the problem such as copyright protection for content providers. Copyright protection of images has become a major concern with the rapid expansion of the Internet, which contains millions of freely available images. Digital watermarking is one of the proposed solutions for copyright protection of multimedia and is becoming a major player not only for use in images but also in the latest technology such as audio, image and video. In this paper robustness of digital image watermarking algorithm based on transforming domain. We are proposing a robust combined Discrete Laguerre Transform (DLT) and Discrete Wavelet Transform (DWT) watermark transformation algorithm. Experimental results show that the higher robustness against common signal processing attacks. The combined of DLT and DWT, the proposed system achieves significantly higher robustness of the method against some common image processing operations such as Salt and Pepper noise addition , Gaussian noise addition, Speckle Noise addition, Cropping, JPEG compression

Video watermarking applications can be grouped as security related like Copy control [18], fingerprinting, ownership identification, authentication, taper resistance etc. or value added applications like legacy system enhancement, database linking [1], video tagging, digital video broadcast monitoring[19], Media Bridge [20] etc.
Apart from robustness, reliability, imperceptibility, practicality, and video watermarking algorithms should also address issues such as localized detection, real time algorithm complexity, synchronization recovery, effects of floating point representation, power dissipation etc [17]. According to the working domain, video watermarking techniques are classified in pixel domain and transform domain techniques. In pixel domain the watermark is embedded in the source video by simple addition or bit replacement of selected pixel positions. The main advantages of using pixel domain techniques are that they are conceptually simple to understand and the time complexity of these techniques are low which favor real time implementations. But these techniques generally lacks in providing adequate robustness and imperceptibility requirements. In transform domain methods, the host signal is transformed into a different domain and watermark is embedded in selective coefficients. Commonly used transform methodologies are discrete cosine transformation (DCT) and discrete wavelet transformation (DWT). Detection is generally performed by transforming the received signal into appropriate domain and searching for the watermarking patterns or attributes.

3. PROPOSED METHODOLOGY

Algorithm

(1)Input any uncompressed video

(2)If video is uncompressed AVI Format, Then go to else stop.

(3) Pull out frames and audio from input video.

(4)Select fractal Image as watermark image.

(5)Watermark a fractal image on every frames of extracted video (proposed algorithm).

(6)Combine all extracted frames into a new video with all watermarked frames.

(7) Insert the audio which was pulled out into new video.

(8)Analyze the video and verify result with existing methods

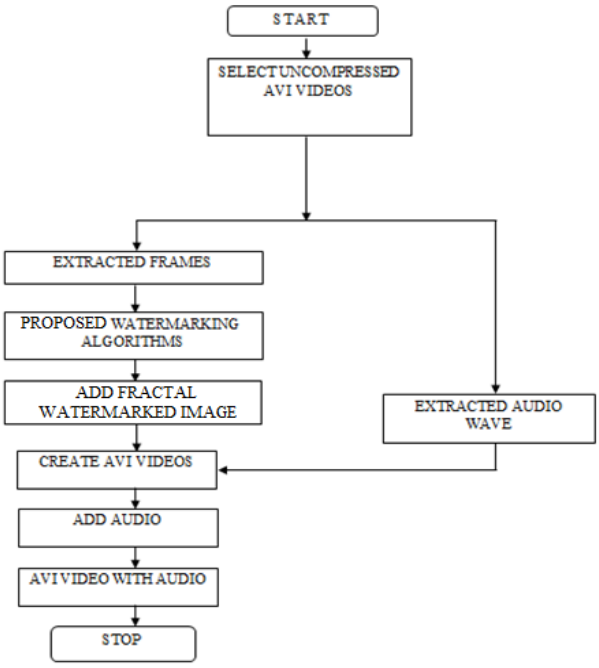

Figure 3 Proposed data Flow diagram

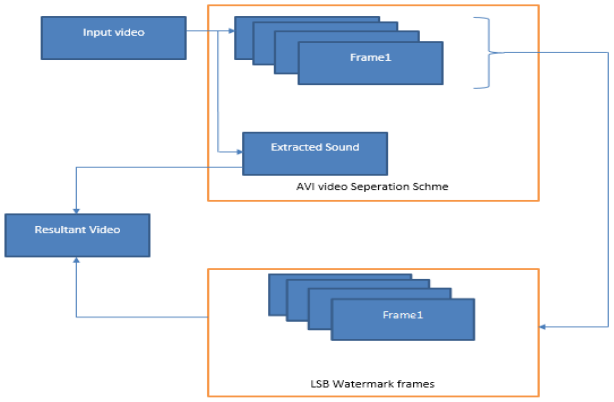

Figure 4 System Flow

Step 1: Input an uncompressed video.

Step 2: Split the inputted Video into separate Frames and a separate audio. As per flow diagram, split frames and an audio. An avi video is represented with an equation

$$vi = \int_{i=1}^{n} \int (fi + Si) + (fi + 1 + Si + 1) + \cdots (fn + sn)$$

Where vi=Avi video

F=Number of Frames.

S= Sample Sound.

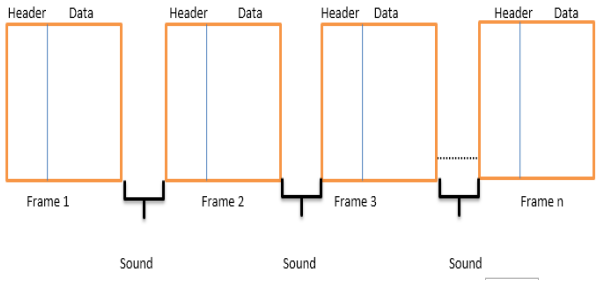

Figure 5 Uncompressed Video file format

Step 4: Insert fractal Image as a watermarked image into extracted frames.

Proposed algorithm focus on LSB watermark insertion scheme that achieves low noise, robustness, reliability etc.

All Frames ***Watermark fractal Image*** ***Watermarked Frame***

Figure 6 Shown with Watermark Image(fractal)

Pixels.

Let an Input image is of size 200 X 200 and watermark image is 20 X 20 Size. It means numbers of pixels watermark in resultant frame is

$$Rf = \frac{100 * Si}{Im}$$

Where
Rf=Resultant Image Pixels
Si=Watermark Image Pixels
Im=Input Image Pixels

Step 5: Combine all extracted frames along with the audio which was pulled out previously into a new joined video from all watermarked frames.
Once all Frames are watermarked properly, comined it into single uncompressed video and then again insert audio into two frames as per shown in figure 3.3

4. RESULT ANALYSIS

S N	Input video name	Size of input video	Frame Size	Audio Size	No of Frames	Audio Format	Image Format
1	Sun.avi	10MB	200x250	5MB	115	.wav	.bmp
2	Sun1.avi	20MB	200x300	15MB	178	.wav	.bmp
3	Sun2.avi	30MB	200x350	20MB	165	.wav	.bmp
4	Sun3.avi	40MB	300x350	25MB	231	.wav	.bmp
5	Sun4.avi	50MB	400x400	25MB	326	.wav	.bmp

Figure 7 Result Analysis

S N	Input video name	Frame Size	Watermark Image Size	Resultant Watermark frame size	Intensity of Frames	Intensity of resultant watermarked frames
1	Sun.avi	200x250	15x15	200x250	0.57	0.67
2	Sun1.avi	200x300	15x15	200x300	0.67	0.367
3	Sun2.avi	200x350	15x15	200x350	0.72	0.82
4	Sun3.avi	300x350	15x15	300x350	0.32	0.42
5	Sun4.avi	400x400	15x15	400x400	0.56	0.36

Figure 8 Change in Frame intensity

5. CONCLUSION

Being as a research scholar we have got many options to secure and digital media. Many aspects of digital watermarking such as security, robustness, high capacity complexity, and low distortion etc. In this paper we have proposed a new scheme which is based on visible watermarking. This includes least significant bit method or can say LSB in a frequency domain watermarking. In this algorithm specific area with its starting coordinates are replaced with the area in original extracted images using least significant bit method. This method gives us highest security and robustness to owner so that nobody can pull out the watermark image because it is theone frame fractal watermark image so if anybody try to extract it will damage complete image resultant all loss. Proposed algorithm uses an uncompressed video as input which capture from any web cam. I have analyzed the resultant video with the existing approaches and have found a great difference in performance.

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