An efficient least significant bit technique[LSB] for video in video watermarking system

1. P.SHEELA
M.E communication systems
PREC
Thanjavur.
sivasheela141@gmail.com

2.Mrs.P.GEETHA, M.Tech
Asst.Professor
PREC
Thanjavur.

ABSTRACT: A digital watermark is a kind of marker covertly embedded in a noise tolerance signal such as audio, video or image data. It is typically used to identify ownership of the copyright of such signal .watermarking is the process of hiding information in a carrier signal, digital watermarking is the process of hiding authenticity of integrity of the carrier signal or to show the identity of its owner. Watermarking is the technique typically used to hide data in video. This technique consists of video processing frame extraction, histogram equalization, least significant bit substitution and frame concatenation .it provides higher security to the transmitting video.

Key points: frame extraction, bit mapping, least significant bit, watermark, and hiding.

1. INTRODUCTION

Digital water marking is a process of embedding unobstructive marks or labels into digital content. These embedded marks are typically imperceptible that can later be detected or extracted. The most important properties of any digital water marking techniques are robustness, security, imperceptibility, complexity and verification. Complexity is described as the effort and time required for water mark embedding and retrival.in the last few years there was rapidly growing interest in ways to hide information in other information. in recent times due to great development in computer and internet technology, multimedia data i.e.,audio,image,video have found wide application. Digital water marking is one of the best solutions to prevent illegal copying, modifying and redistributing multimedia data. Digital watermarking is a technique to embed copyright or other information into the underlying data.

2. LITERATURE SURVEY

[1]F.AHMED proposed a paper based on watermarking is done in an image by using correlation based water marking method. The authentication is inseparably bound to the content whereby the author has a unique key associated with the content

[2]P.VISWANATHAN, P.VENKATAKRISHNAN proposed a paper in a joint fed water marking means a joint fingerprint/encryption/dual water marking for addressing the issues. This paper aims to give confidentiality, availability, integrity and origin. The spatial fusion algorithm which determines the region of embedding using threshold from the images to encrypt data.

[3]CHANDREYEE proposed that hiding a data in another medium by using LSBalgorithm. Steganographic is the art of hiding information in media is gaining momentum as its scores over cryptography because it enables to embed the secret messages to cover images.

3. SYSTEM ANALYSIS

The first watermarking example similar to the digital water marking in 1954. The MUZAK corporation field a pattern for watermarking musical work, an identification work was inserted in music by intermittently applying a narrow notch filter centered at 1KHZ.

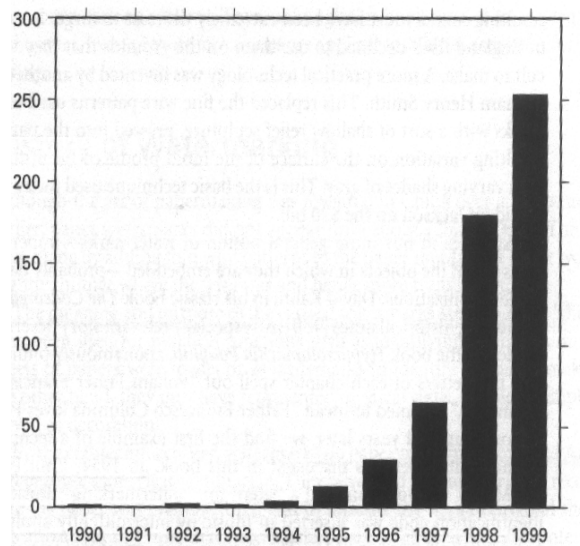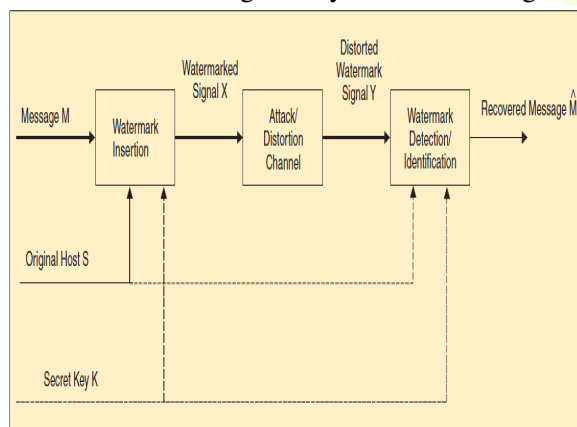About 1995, interest in digital watermarking

Fig3.1 Annual number of paper published on watermarking

The information to be embedded in a signal is called digital water marking, although in some contexts the phrase digital watermarking means the difference between the watermarked signal and the cover signal by the host signal.

DISCRETE COSINE TRANSFORM

DCT is widely used transformation when it comes to image processing, through DCT,spaial domain data can be transformed in to the frequency domain data can be transformed

$$D(i,j)=1/\sqrt{}\sqrt{2N} \qquad C(i)$$
$$C(j)\sum\sum f(x,y)\times\cos[2x+i\pi\div2N]\ \cos[(2y+1)i\pi/2N]$$

Where

$$C(k)=\{1/\sqrt{2}\quad \text{if}\quad k=0,1\quad \text{if } k=1,2,\ldots\ldots N\text{-}1$$

Fig 3.2coefficient matrix of DCT

$$Y(i.j)=1/\sqrt{2N}\sum\sum c(i)c(j)D(i,j)\times\cos[(2x+1)i\pi/2N]\ \cos[(2y+1)i\pi/2N]$$

Fig 3.3a) original image b) watermarked image

Fig 3.4a) water mark image with error

b) blurred watermark image

4. SIMULATION AND RESULT EVALUATION

VIDEO TO FRAME EXTRACTION

The video to frame extraction can be done using so many software which are available in matlab. To get the frames from video software. Frame extraction in image processing application like contend based video retrieval, shot detection,segmentation,cc cameras,etc.

The shot detection technique is implementation involves background information, which requires the storage memory of more.

a) sum of the absolute pixel difference

b) histogram comparison

c) Statistical difference

d) edge detection

e) threshold comparison

f) motion vector

VIDEO FRAME ENCODING ALGORITHM [LSB]

LSB algorithm [least significant bit] substitution is the process of adjusting the least significant bit pixels of the carrier image.LSBvaries according to number of bits in an image.LSB is effective in using BMP images since compression in BMP is changed.LSB substitution is also possible for GIF format, whereLSB is changed the whole color palette will be changed. For JPEG,the direct substitution of Steganographic techniques is not possible it will use lossy compression.

Step1: Let n LSB be substituted in each pixel. Step2: Let d=decimal value of the pixel, d1=decimal value of last n bits of the pixel, d2=decimal value of n bits hidden in that pixel

Step3: if $(d1\_d2) \leq (2^n)/2$

Step4: if (d1d2) $d=d+2^n$

Example for a 24 bit map

Insert an A (10000011) binary value into 24 bit images using RGB image model.

	Red	green	blue
Pixel1	00100011	11101001	11001000
Pixel2	00100111	11001000	11101001
Pixel3	11001000	00100111	11101001

The changed sequence with A bit sequence (10000011)

Pixel1	00100111	11001000	11001000
Pixel2	00100110	11001000	11101001
Pixel3	11001001	00100111	11101001

'Area'	'EulerNumber'	'Orientation'
'BoundingBox'	'Extent'	'Perimeter'
'Centroid'	'Extrema'	'PixelIdxList'
'ConvexArea'	'FilledArea'	'PixelList'
'ConvexHull'	'FilledImage'	'Solidity'
'ConvexImage'	'Image'	'SubarrayIdx'

'Eccentricity'	'MajorAxisLength'	
'EquivDiameter'	'MinorAxisLength'	

5. CONCLUSION

Digital watermarking has rapidly advanced over steganography, cryptography and also focuses on different types of digital watermarking techniques common application requirement for the watermark is that they resist attacks that would remove it. There also some techniques like blind watermarking which uses watermark nesting and encryption. The experimental result showed that the proposed method is robust against most of the non geometric attacks.moreover; the LSB algorithm offers a significant advantage in shorter processing time

6. REFERENCES

[1]M.Swasnson, B.Zhu, A.Tewfik "Robust audio watermarking using perceptual masking", 1997

[2]L.Boney,A, Tewfik and..Hamdy,"digital water marks for audio signals," in ieeeproc.multimedia, 1996

[3]Berghel.H (1998)"digital watermarking makes it mark.networker: the craft of network computing.

[4]Arn.J, Gatlin.R, Multimedia copyright laws and guidelines: businesscommunication quarterly, 32-39.

[5]KeshavS Rawat, DheerendraS Tomar,"digital water marking schemes for authorization against copying or privacy of color images" in IEEE, vol1.No.4293-300

[6]LAN, twefik (1999, October 30-November 5) Fraud detection and self embedding.

[7]Mennen &Wong PROTECTING DIGITAL MEDIA CONTENT. Communication of the ACM

[8]Anthony t.s.Ho,jun shen,soon Hoe Tan "a robust digital image in image watermarking algorithm using the fast hadamard transform "proceeding of SPIEvol.4793(2003).

[9]Samuelsson's(1999).Good news and bad news on the intellectual property front. Communication of the ACM

[10]Zhao. Koch.e&luo.c(1998).in business today and tomorrow. Communication of the ACM41 (7), 67-71

[11]YEung.m, yeo.b&Holliman.m (1998, November/December) digital watermarking: shedding light on the invisibleIEEE Micro, 18(6).32-41.