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A Real Time Approach to Digital Video Watermarking for Copyright Protection Applications

Dr. P.V. Naganjaneyulu
Professor & Principal,
Department of ECE,
MVR College of Engineering & Technology, NH-9, Paritala,
Vijayawada Rural, Andra Pradesh.

ABSTRACT:

Here, we introduced a robust and highly authenticated visible video watermarking technique, which is used as the copyright protection application for many govt. companies, organizations, industries and etc., We proposed a lossless video watermarking technique using two methods called as watermarking with monochrome and translucent images based on One-to-One compound mapping of the values of the image pixels, which provide us the recovered video without any loss. Both the translucent full color and Opaque monochrome images are used in this paper. Two-fold monotonically increasing compound mapping is used to get more typical visible watermarks in the video. Measures have been taken to protect it from hackers.

I.INTRODUCTION:

Digital video watermarking methods are usually classified into two types: visible and invisible [1-7]. The invisible watermarking aims to embed copyright information into host media, in case of copyright infringements, to identify the ownership of the protected host the hidden information can be retrieved. It is important that the watermarked image must be resistant to common image operations which ensure that the hidden information after alterations is still retrievable. On the other hand, methods of the visible watermarking yield visible watermarks. These visible watermarks are generally clearly visible after applying common image operations. In addition, ownership information is conveyed directly on the media and copyright violations attempts can be deterred. In general Embedding of watermarks, degrade the quality of the host media. The legitimate users are allowed to remove the embedded watermark and original content can be restored as needed using a group of techniques, namely reversible watermarking [8-11].

However, lossless image recovery is not guaranteed by all reversible watermarking techniques, which means that the recovered image is same as the original. Lossless recovery is important where there is serious concerns about image quality such as include forensics, military applications, historical art imaging, or medical image analysis. The most common approach is to embed a monochrome watermark using deterministic and reversible mappings of pixel values or DCT coefficients in the watermark region [6, 9, 11]. Another is to rotate consecutive watermark pixels to embed watermark that is visible [11].the watermarks of arbitrary sizes can be embedded into any host image.

Only binary visible watermarks can be embedded using these Approaches. A new method for lossless visible watermarking is proposed by using compound mappings which allow mapped values to be controllable The approach is generic, leading to the possibility of embedding different types of visible watermarks into cover images. Two applications of the proposed method are demonstrated; where we can embed opaque monochrome watermarks and non-uniformly translucent full-color ones into color images.

II.PROPOSED TECHNIQUE:

Here, we propose a generic one-to-one compound mapping for converting a set of numerical values

$P = \{p_1, p_2, \ldots . p_M\}, Q = \{q_1, q_2, \ldots . q_M\}$, such that the mapping p_i and q_i for all $i = 1,2,3,\ldots, M$ is reversible. Here, all the values of p_i and q_i are gray scale or color image pixel values, which are investigated for copy right protection applications. The compound mapping f is governed by a one-to-one function F_x with one parameter

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$x = a$ *or* b in the following way:

$$q = f(p) = F_b^{-1}(F_a(P)) \quad (1)$$

Where F_x^{-1} is the inverse of F_x

The compound inverse mapping will be obtained by eq.1 is given by

$$p = f^{-1}(q) = F_a^{-1}(F_b(q)) \quad (2)$$

The proposed algorithm is described as follows:

Algorithm 1:

Input: Original video, watermark logo image
Output: Watermarked Video

Steps:

1.First, select and read the original video from the current directory folder in MATALB

2.Convert the video into number of frames i.e., number of frames per second.

3.Then convert the frames into number of images, from these set

$I_i = \{I_1, I_2, \ldots, I_i\}$ of images select the image I_1 and select a set of 'P' pixels where the logo is to be embedded, where P is watermarking area.

4. Corresponding set of pixels P in I_1 are denoted by Q.
5. For each pixel X with value p in P, corresponding pixel in Q is denoted as Z and corresponding pixel Y in L as l and follow the below steps.
   (a). Apply an estimation technique to derive 'a' to be a value close to 'b' using the value of the neighboring pixels of X
   (b). Set 'p' to be the value 'l'
   (c). Map 'p' to a new value $q = F_b^{-1}(F_a(P))$.

(d). the value of Z is set to q.

6.Now, repeat the same process for every image, i.e., the set of images obtained from the original video.

7.Reconstruct the images into frames and then into video, which is a watermarked video in which the logo image has been embedded for copyright protection applications.

As an example, the purpose performed by Step:5 of the above algorithm for a pixel is illustrated by below figure 1 .Here the color of the center pixel is estimated by using west and north pixels As the pixels are unknown to the receiver and covered by the watermark the east and south pixels are not used.

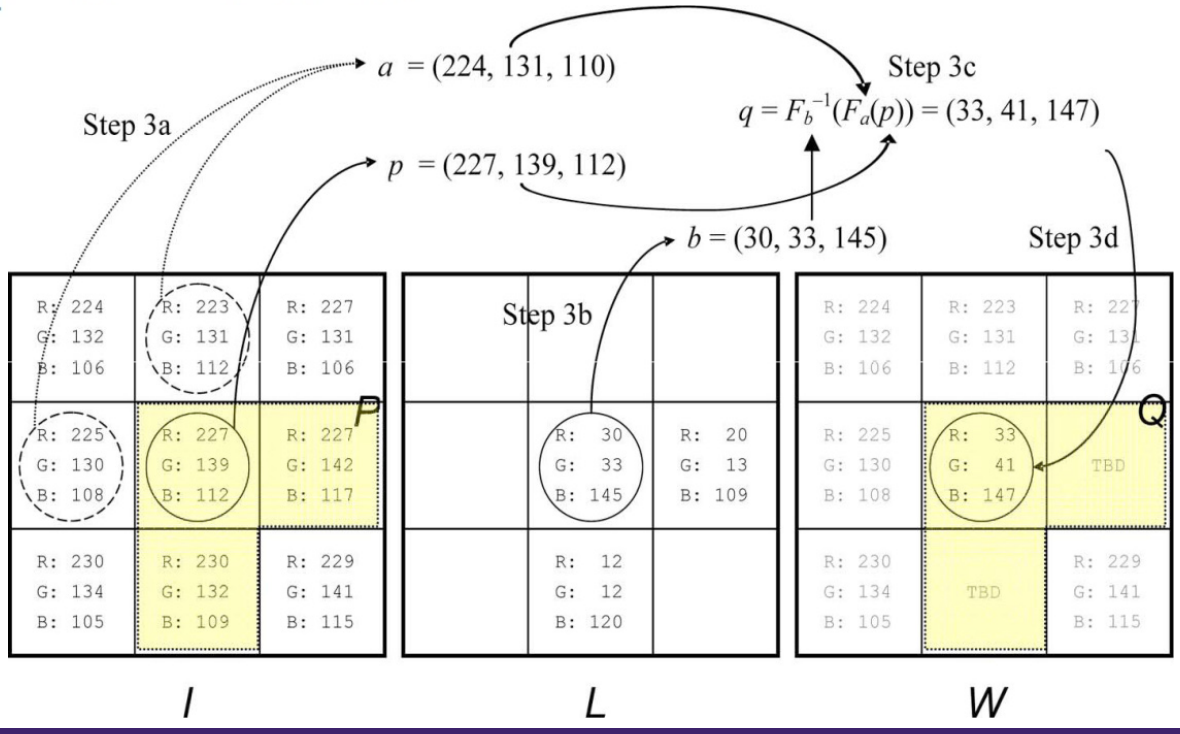

Fig.1 Proposed One-to-One Compound mapping scheme

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Following algorithm describes removal process for watermarked image.

Algorithm 2:

Input: watermarked Video, watermark logo (L).
Output: recovered video 'R'.

Steps:

1.First, read the watermarked video and covert the video into number of frames

2.Now, convert the frames into the number of images and select the image 'W' form the set of images .

3.The watermarking area Q is selected in W as the area selected in Algorithm 1.

4.Value of each pixel in R is set, which is outside the region Q, to be equal to the corresponding pixel in W.

5.For each pixel Z with value q in Q, denote the corresponding pixel in the recovered image R as X and the value of the corresponding pixel Y in L as l, and conduct the following steps.

(a) Obtain the same value by applying the same estimation technique used.

b) Set b to be the value l.

c) Restore p from q by setting

$$p = F_a^{-1}(F_b(q))$$

d) Set the value of X to be p.

III.EXPERIMENTAL RESULTS:

In our simulation results we had executed the MATLAB program in 2104a version of MATALB with the specifications of 4GB Ram, i3 processor. We had tested the program code for different videos of format .avi and also tested with various logo images to obtain the precision. In fig.2 we had shown the original video frame, which is to be watermarked with logo image. The logo image has shown in fig.2 (b). The watermarked and reconstructed frames had shown in fig.3

(a)

(b)

Fig.2 Original video frame and logo image

(a)

(b)

Fig.3 Watermarked video frame and reconstructed video frame

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IV.CONCLUSION :

In this letter, we proposed a new and robust visible authenticated video watermarking based on one –to-one compound mapping. It produces almost 100% recovered frames form the watermarked video frames, that's why we call it as lossless visible video watermarking. This will help us to protect the digital video from the copying by unauthorized parties. It provides more authenticated watermarking towards the video content. In future we can work out on considering more number of frames at a time and to improve the copyright protection for ownership.

REFERENCES:

1.G. Braudaway, K. A. Magerlein, and F. Mintzer, "Protecting publicly available images with a visible image watermark," in Proc. SPIE Int. Conf. Electronic Imaging, Feb. 1996, vol. 2659, pp. 126–133.

2.J. Cox, J. Kilian, F. T. Leighton, and T. Shamoon, "Secure spread spectrum watermarking for multimedia," IEEE Trans. Image Process., vol. 6, no. 12, pp. 1673–1687, Jun. 1997.

3.F.A.P Patitcolas, R.J.Anderson, and M.G.Kun"Information hiding- A survey"- Proc. IEEE,vol:87, no.7, jul. 1999.

4.M. S. Kankanhalli, Rajmohan, and K. R. Ramakrishnan, "Adaptive visible watermarking of images," in Proc. IEEE Int. Conf. Multimedia Computing and Systems, 1999, vol. 1, pp. 568–573.

5.S. P. Mohanty, K. R. Ramakrishnan, and M. S Kankanhalli, "A DCT domain visible watermarking technique for images," in Proc. IEEE Int. Conf. Multimedia and Expo, Jul. 2000, vol. 2, pp. 1029–1032.

6.N. F. Johnson, Z. Duric, and S. Jajodia, Information Hiding. Steganography and Watermarking Attacks and Countermeasures. Boston, MA: Kluwer, 2001.

7.Y. Hu and S.Kwong,"Wavelet domain adaptive visiblewatermarking," Electron. Lett., vol. 37, no. 20, pp. 1219–1220, Sep. 2001.

8.Y. J. Cheng and W. H. Tsai, "A new method for copyright and integrity protection for bitmap images by removable visible watermarks and irremovable invisible watermarks," presented at the Int. Computer Symp. Workshop on Cryptology and Information Security, Hualien,Taiwan, R.O.C., Dec. 2002.

9.P. M. Huang and W. H. Tsai, "Copyright protection and authentication of grayscale images by removable visible watermarking and invisible signal embedding techniques: A new approach," presented at the Conf. Computer Vision, Graphics and Image Processing, Kinmen, Taiwan, R.O.C., Aug. 2003.

10.Y. Hu, S. Kwong, and J. Huang, "An algorithm for removable visible watermarking," IEEE Trans. Circuits Syst. Video Technol., vol. 16, no. 1, pp. 129–133, Jan.2006.

11.S. K. Yip, O. C. Au, C. W. Ho, and H. M. Wong, "Lossless visible watermarking," in Proc. IEEE Int. Conf. Multimedia and Expo, Jul. 2006, pp. 853–856.