ISSN: 2278 – 909X
International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE)
Volume 6, Issue 11, November 2017

PRINTING WATERMARK IMAGE BY USING DIRECT BINARY SEARCH HALF TONE

V.Ashok[1], J. Panduranga Rao[2], B. Sreenivasu[3]

ABSTRACT

A novel technique for nonexclusive obvious watermarking with a capacity of lossless image recuperation is proposed. The method is in light of the utilization of deterministic balanced compound mappings of image pixel esteems for overlaying an assortment of obvious watermarks of self-assertive sizes on cover images. The compound mappings are turned out to be reversible, which takes into consideration lossless recovery of unique images from watermarked images. The mappings possibly changed in accordance with yield pixel esteems near those of wanted noticeable watermarks. Different sorts of obvious watermarks, including opaque monochrome and translucent full shading ones, are inserted as applications of the proposed bland approach.

Keywords—DBS, Halftoning, Watermarking

I. INTRODUCTION

The progress of PC advancements and the proliferation of the Internet have made propagation and distribution of digital data less demanding than any time in recent memory. Copyright protection of scholarly properties has, in this way, move toward becoming an important subject.

One path for copyright assurance is digital watermarking, which implies inserting of certain specific information about the copyright holder (organization logos, ownership descriptions, and so forth.) into the media to be protected. Digital watermarking strategies for images are normally categorized into two sorts: undetectable and obvious.

The principal sort aims to implant copyright data impalpably into have media such that in instances of copyright encroachments, the concealed information can be recovered to recognize the responsibility for protected host. It is essential for the watermarked image to be resistant to basic image operations to guarantee that the hidden information is as yet retrievable after such changes.

Methods of the second sort, then again, yield obvious watermarks which are for the most part unmistakably noticeable after regular image operations are connected. What's more, noticeable watermarks pass on ownership information specifically on the media and can discourage attempts of copyright violations.

A few lossless undetectable watermarking systems have been proposed before. The most widely recognized approach is to compress a segment of the first host and after that insert the compressed data together with the proposed payload into the host.

Another approach is to superimpose the spread-spectrum signal of the payload on the host with the goal that the flag is detectable and removable.

As to lossless obvious watermarking, the most widely recognized approach is to insert a monochrome watermark utilizing deterministic and reversible mappings of pixel esteems or DCT coefficients in the watermark district. Another approach is to rotate consecutive watermark pixels to install a noticeable watermark. One favorable position of these methodologies is that watermarks of arbitrary sizes can be inserted into any host image. However, only double noticeable watermarks can be implanted utilizing these approaches, which is excessively prohibitive since most organization logos are brilliant. More particular compound mappings are additionally made and proved to have the capacity to yield outwardly more unmistakable noticeable watermarks in the watermarked image.

II. Types of Watermarking

Barring the conspicuous instance of noticeable watermarks, we can order the watermarks as FRAGILE or ROBUST. The delicate watermark is utilized for recognizing even the littlest adjustment of a image.

While the powerful one is extraordinarily intended to withstand an extensive variety of "assaults", which essentially are attempting to evacuate the watermark, however without annihilating the image/video.

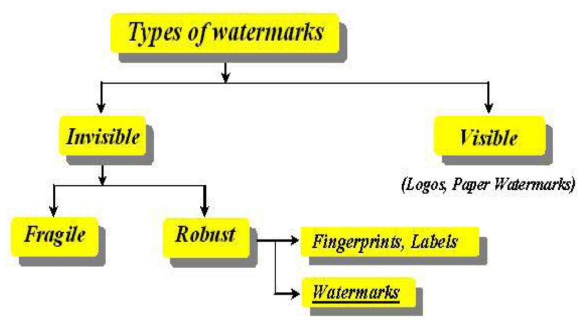

Fig (1): types of watermarks

Visible watermarking is related with the view of the human eye to recognize where the data has been inserted on the image. The hindrance of this technique is that the watermarked image does not resemble the first one but rather then again demoralizes the assailant to assault the image. A visible watermark is a noticeable translucent image which is overlaid on the essential image. Maybe comprising of the logo or seal of the association which holds the rights to the essential image, it enables the essential image to be seen, yet checks it unmistakably as the property of the owning association.

It is imperative to overlay the watermark in a way which makes it hard to evacuate, if the objective of demonstrating property rights is to be accomplished.

Invisible watermarking is the technique that can conceal the data on the image breaking down if imperceptible to the human eye. The inconvenience is that is more defenseless against assaults then again the image is indistinguishable to the first one.

Invisible watermarks can be comprehensively characterized into two sorts, strong and delicate watermarks. Strong watermarks are for the most part utilized for copyright assurance and possession confirmation since they are powerful to about a wide range of image handling operations.

III. Watermarking based authentication

Let us initially endeavor to get free off the initial two downsides (above recorded). Mean X the set of pieces of substance of a given size. The endorser work is a change from X to X .No increment in content size is in this manner endured. Representations the general structure of the underwriter work: a first procedure produces the message to be shrouded; a second one implants this message in content on account of a watermarking strategy. These two functions from the earlier get a mystery key as info. The aggregate key of the marking function is kS = {kM, kW}, with kM the mystery key for the message age, and kW the secret key for the watermarking installing. So also, kV = {k0, kW}.

Note that the watermarking strategy utilizes a similar key at the installing and at the disentangling. The verifier can't fall back on the first image: the watermarking decoder is along these lines daze. We need to exact the necessities of the watermarking technique: capacity, strength, intangibility. The techniques point by point in this subsection are classified into three methodologies as indicated by the sort of the data to be hidden in content. The initial two procedures copy the MAC plot as the verifier must be trusted: k0M = kM the last one fall back on open key encryption as in a DS scheme: k0M 6= kM

Nearby verification when the verifier expresses a bit of substance isn't real, the client might want more data, particularly about the area of the altered territories. The verifier would yield a guide of the non-valid areas.

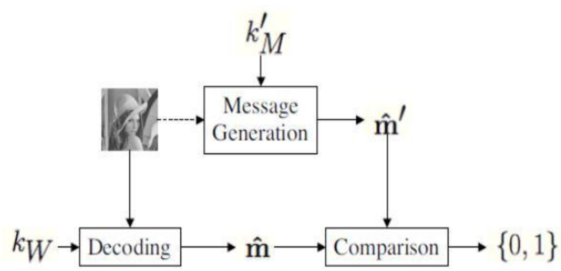

Fig (2): Overview of the verifier function

For example, this would cautions the user whether the image is unsigned (a totally full guide), or whether it has been maliciously altered (some conservative ranges in the map).The arrangement brought by water markers is truly straightforward.

IV. Watermarking applications:

There are two primary utilizations of watermarking, copyright assurance and data covering up. For the zone of copyright insurance, the client can unambiguously recognize themselves as the proprietor of the image (video, sound and so forth.) For data concealing, information can be covered up in an apparently typical image and the image transmitted. The information would then be able to be removed at the flip side, accepting that the client at the flip side has the significant data to do as such. In this segment, we depict seven uses of the watermarking strategies.

V. Reversible One-to-One Compound Mapping

First, we propose a generic one-to-one compound mapping for converting a set of numerical values. $P = \{p_1, p_2 \ldots, p_M\}$ to another set $Q = \{q_1, q_2 \ldots, q_M\}$, such that the respective mapping from Pi to qi for all $i = 1, 2, \ldots, M$ is reversible. Here, for the copyright protection applications investigated in this study, all the values pi and qi are image pixel values (grayscale or color values). The compound mapping is governed by a one-to-one function Fx with one parameter x=a or b in the following way:

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

Where F_x^{-1} is the inverse of Fx which, by the one-to-one property, leads to the fact that if $F_a(p) = p'$ then $F_a^{-1}(p') = p$ for all values of pi and qi. On the other hand, $F_a(p)$ and $F_b(p)$ generally are set to be unequal if $a \neq b$. The compound mapping described by (1) is indeed reversible, that is, can be derived exactly from using the following formula:

The compound mapping described by (1) is indeed reversible, that is, p can be derived exactly from q using the following formula:

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

as proved below.

Lemma 1 (Reversibility of Compound Mapping): If $q = F_b^{-1}(F_a(p))$ for any one-to-one function Fx with a parameter x , then $p = F_a^{-1}(F_b(q))$ for any values of a,b,p and q.

Proof: Substituting (1) into, $F_a^{-1}(F_b(q))$, we get

$$F_a^{-1}(F_b(q)) = F_a^{-1}\left(F_b\left(F_b^{-1}(F_a(p))\right)\right).$$

By regarding Fa(p) as a value c, the right-hand side becomes , $F_a^{-1}(F_b(F_b^{-1}(c)))$, which, after and are cancelled out, becomes $F_a^{-1}(c)$ but $F_a^{-1}(c) = F_a^{-1}(F_a(p))$, which is just p after F_a and F_a^{-1} are cancelled out. That is, we have proved $p = F_a^{-1}(F_b(q))$

As an example, if $F_x(p) = xp + d$, then $F_x^{-1}(p') = (p' - d)/x$. Thus

$$q = F_b^{-1}(F_a(p)) = F_b^{-1}(ap + d)$$
$$= (ap + d - d)/b = ap/b$$

And so we have,

$$F_a^{-1}(F_b(q)) = F_a^{-1}(b(ap/b) + d) = F_a^{-1}(ap + d)$$
$$= [((ap + d) - d)/a] = (ap/a) = p$$

VI. Lossless visible watermarking of monochrome watermarks

As a utilization of the proposed nonexclusive way to deal with lossless visible watermarking, we portray now how we insert a losslessly-removable misty monochrome watermark into a shading image to such an extent that the watermark is outwardly particular in the watermarked image. In the first place, we signify the arrangements of those pixels in relating spatially to the high contrast pixels in by and individually. An outline of such territories of and is appeared in Fig. 4. We characterize and also for the watermarked image, which compare to and, individually. At that point, we embrace the straightforward balanced capacity, and utilize a similar match of parameters and for all mappings.

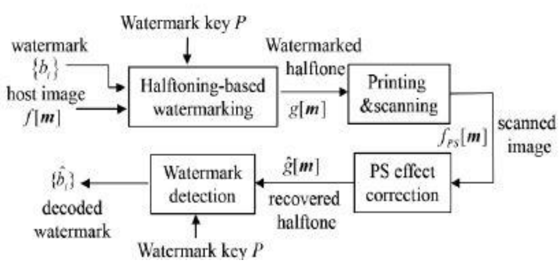

Fig (3): Flow chart of experiment

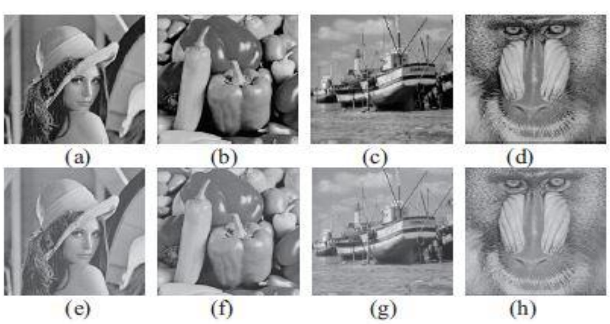

Fig (4): images of Lena and paper boat and mandrill (a)-(d), original images, (e)-(h) DBS halftones.

VII. Conclusions and Suggestions for future work

A new method for reversible visible watermarking with lossless image recovery capability has been proposed. The method uses one-to-one compound mappings that can map image pixel values to those of the desired visible watermarks. Relevant lemmas and theorems are described and proved to demonstrate the reversibility of the compound mappings for lossless reversible visible watermarking. The compound mappings allow different types of visible watermarks to be embedded, and two applications have been described for embedding opaque monochrome watermarks as well as translucent full-color ones.

VIII. REFERENCES

[1] F. A. P. Petitcolas, R. J. Anderson, and M. G. Kuhn, "Information hiding—A survey," Proc. IEEE, vol. 87, no. 7, pp. 1062–1078, Jul. 1999.

[2] N. F. Johnson, Z. Duric, and S. Jajodia, Information Hiding. Steganography and Watermarking—Attacks and countermeasures. Boston, MA: Kluwer 2001.

[3] I. 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.

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

[5] Y. Hu and S.Kwong,“Wavelet domain adaptive visiblewatermarking,” Electron. Lett., vol. 37, no. 20, pp. 1219–1220, Sep. 2001. [6] 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.

[7] G. Braudaway, K. A. Magerlein, and F. Mintzer, “Protecting publiclyavailable images with a visible image watermark,” in Proc. SPIE Int.Conf. Electronic Imaging, Feb. 1996, vol. 2659, pp. 126–133.

[8] Y. J. Cheng and W. H. Tsai, “A new method for copyright and integrityprotection for bitmap images by removable visible watermarksand irremovable invisible watermarks,” presented at the Int. ComputerSymp.—Workshop on Cryptology and Information Security, Hualien,Taiwan, R.O.C., Dec. 2002.

[9] P. M. Huang and W. H. Tsai, “Copyright protection and authenticationof grayscale images by removable visible watermarking and invisiblesignal 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 visiblewatermarking,” IEEE Trans. Circuits Syst. Video Technol., vol. 16, no.1, pp. 129–133, Jan. 2006.

[11] Y. Hu and B. Jeon, “Reversible visible watermarking and lossless recoveryof original images,” IEEE Trans. Circuits Syst. Video Technol.,vol. 16, no. 11, pp. 1423–1429, Nov. 2006.

[12] B. Macq, “Lossless multiresolution transform for image authenticatingwatermarking,” presented at the European Signal Processing Conf.,Tampere, Finland, Sep. 2000.

[13] J. Fridrich, M. Goljan, and R. Du, “Lossless data embedding—Newparadigm in digital watermarking,” J. Appl. Signal Process., vol. 2002,no. 2, pp. 185–196, Feb. 002.

V.Ashok[1]
Dept. of ECE,
Sreyas Institute of Engineering & Technology, Hyderabad.
Telangana, India.

J. Panduranga Rao[2]
Associate Professor,
Dept. of ECE,
Sreyas Institute of Engineering & Technology, Hyderabad.
Telangana, India.

B. Sreenivasu[3]
Associate Professor & HOD,
Dept. of ECE,
Sreyas Institute of Engineering & Technology, Hyderabad.
Telangana, India.