

# Generic Lossless and Visible Watermarking For Color Images

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**ABSTRACT:** The advance computer technologies and the rapid increase in use of the World Wide Web have made reproduction and circulate of digital information is easier than before. Copyright protection of properties has, become a very important topic in daily life. One way is - Digital Watermarking, means a visible signature embedded inside an image to show proof of ownership. That signature may be company logo's, ownership descriptions etc. Digital Watermarking methods for images are categorized into two types: visible and invisible. Visible watermarking are generally visible after common image operations applied. In addition, visible watermark convey ownership information directly on the media. Invisible watermarking doesn't reduce usability, Store the watermark in imperceptible data, and image is slightly changed, but appears unchanged. Embedding watermarks degrade the quality of host media. A group of techniques allow legitimate users to remove the watermark and restore the original image as needed. However, not all reversible watermarking technique guarantees lossless image recovery.

**KEYWORDS:** Copyright, visible watermarking and imperceptible area.

## I. INTRODUCTION

The advance computer technologies and the rapid increase in use of the World Wide Web have made reproduction and circulate of digital information is easier than before. Copyright protection of properties has, become an very important topic in daily life. One way is -Digital Watermarking, means a visible signature embedded inside an image to show proof of ownership. That signature may be company logo's, ownership descriptions etc. Digital Watermarking methods for images are categorized into two types: -visible -invisible. Visible watermarking are generally visible after common image operations applied. In addition, visible watermark convey ownership information directly on the media. Invisible watermarking doesn't reduce usability, Store the watermark in imperceptible data, and image is slightly changed, but appears unchanged. Embedding watermarks degrade the quality of host media. A group of techniques allow legitimate users to remove the watermark and restore the original image as needed. However, not all reversible watermarking technique guarantees lossless image recovery. The Lossless visible watermarking is suggested by using some compound mappings. The mappings are also demonstrated to be reversible for lossless recovery of the original picture. The approach is generic, leading to the possibility of attaching the different types of visible watermarks into cover pictures. The compound mapping allows different watermark to be embedded, they are -Monochrome Watermark -Translucent full-color ones.

From the literature it is observed that, still there is a scope to examine and determine the suitability of a watermarking scheme with respect to properties like; fidelity, capacity and robustness. The requirements are application-dependent, but some of them are common to most practical applications. These are embedded into color images. Visible watermarks carry ownership information directly on the media/images and can deter(fear of consequences) attempts of copyright violations. Lossless recovery is very important in many applications where serious anxiety about image quality arises. Some of the examples include historical art imaging, military applications, forensics etc. Several lossless invisible watermarking techniques have been introduced in the past. We may use lossless invisible

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techniques to attach removable visible watermarks, low attaching capacities of these techniques make it difficult the possibility of inserting large-sized visible watermarks into host media. As to lossless visible watermarking, the common approach is to attach a monochrome watermark using deterministic and reversible mappings (associates each element with one or more) of pixel values or DCT coefficients in the watermark region. A new technique/method for lossless visible watermarking is suggested by using compound mappings that allow the mapped values to be test or verified. The mappings(associates each element with one or more) are proved to be reversible for the lossless return to the normal state of the original picture. The approach is generic, leading to the possibility of attaching different types of visible watermarks into cover pictures.

## II. RELATED WORK

(Piyush .V. Gattani and C. S. Warnekar,2014) suggested a new invisible digital watermarking scheme for color images based on the amalgamation of wavelet transform (SWT2) with singular value decomposition (SVD), and advanced encryption scheme (AES). (Anu Bajaj,2014) surveyed that still there is a necessity in order to significantly improve performance of digital watermarking. New secure techniques can be proposed for copyright protection so that the performance of algorithms can be enhanced by combining with security techniques. Most of the work had been done for increasing the robustness of the techniques, but there are some applications like tamper proofing which require fragile watermarks; new techniques can be proposed for fragility. New schemes for medical images can be proposed for medical database. (Shuchi Sirmour, Archana Tiwari, 2014) developed a hybrid DWTSVD based algorithm for watermark embedding and extracting process. The suggested method is performed by modification on singular value decomposition of images in Discrete Wavelet Transform (DWT) domain. Modification of the appropriate sub-bands leads to a watermarking scheme which favorably preserves the quality. They shown good robustness by using hybrid DWT-SVD method in comparison with DWT based watermarking algorithm using Haar wavelet. (S.Manikanda prabu and Ayyasamy, 2014) have proposed a watermarking algorithm based on DWT and FFT Approach. (Apoorv Tiwari et.al., 2014) have developed digital image watermarking using fractional Fourier Transform with Different Attacks. (M. Kim et.al., 2014) proposed an algorithm that has improved the extraction performance by accurately extracting the hidden information in the 2D barcode from the detected watermark. Also, combining the dual transform method, DWT and DFRNT, has improved the imperceptibility and robustness of the watermark against basic image signal processing attacks. ( Hongqin Shi et.al.,2014) presented a new color watermark embedding technique with circulation, based on non-overlapping Singular Value Decomposition (SVD) for hiding important information in images.( Kaushal R. Patel and Nabila Shaikh, 2014) proposed a Robust color image watermarking based on DWT-HT. An easy way to comply with the conference paper formatting requirements is to use this document as a template and simply type your text into it.

## III. PROPOSED ALGORITHM

**Add Watermark:** Add watermark is to add the watermark picture onto the original picture. Add Watermark when pressed the watermark picture will be added onto the original picture according to the logo position.

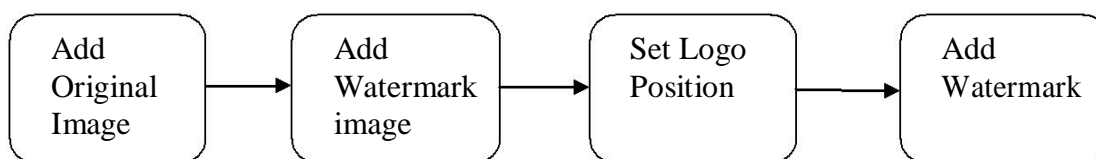


Fig.1: Adding watermark

**Remove Watermark:** Remove watermark is to remove the watermark from the original picture to give the user the original picture.

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Fig 2: Removing Watermark

**Split Images:** Split images is the one which split the watermark image into two parts.

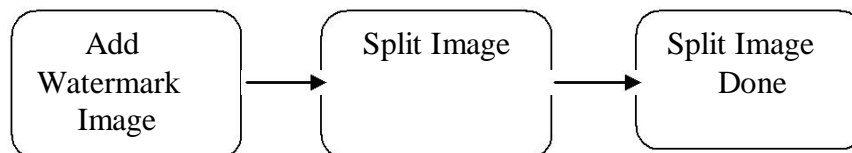


Fig.3: Splitting Watermark Image

**Set Up:** Set Up is the one which shows you options to set the position of the watermark image and to make it monochromic or white transparent.

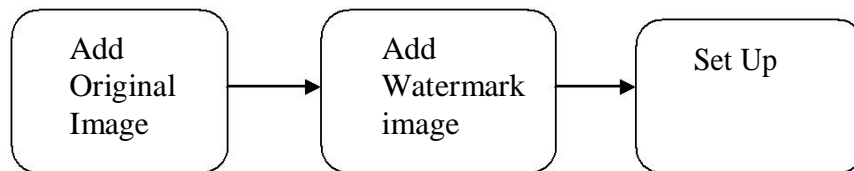


Fig .4: Setting of logo position

**Watermark key:** Watermark key is key given while adding the watermark. The same key should be used to remove the watermark.

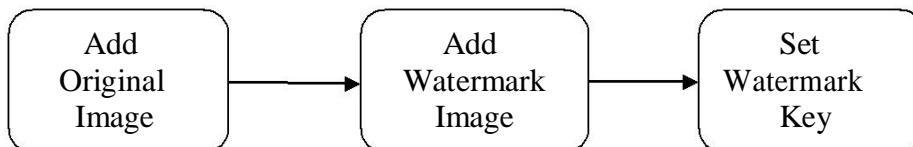


Fig .5: Set watermark key

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Implementation means bringing the thing into executable form so that they can run in real time.

## // Algorithm for adding watermark

Input: an image I and a watermark M

Output: watermarked image W.

Steps

1. Choose a set P of pixels from I where M is to be

Attached/embedded, and call P a watermarking area.

2. Represents the set of pixels corresponding to P in W by G.

3. For each pixel X with value p in P, denote the corresponding pixel in G as Z and the value of the corresponding pixel y in M as l, and conduct the following steps.

Step a. Apply an rough calculation technique to derive a to be a value close to p, using the values of the neighboring(beside) pixels of X (excluding x itself).

Step b. Set b to be the value l.

Step c. Attach p to a new value  $g = Fb^{-1}(Fa(p))$ .

Step d. Set the value of Z to be g.

4. Set the value of each remaining pixel in W, which is outside the region P, to be equal to that of the corresponding pixel in I.

Note: We **don't** use the information of original picture pixels values of X as for computing the parameters a and b for x. this ensures that identical parameter( boundary defines the scope) values can be calculated by the receiver o the watermarked picture for the purpose of lossless picture recovery.

## //Algorithm for retrieving the watermark

Input: a watermarked picture W and a watermark M

Output: The original picture R recovered from W

Steps:

1. Select the same watermarking area G in W as that selected in algorithm 1

2. Set the value of each pixel in R, which is outside the region G, to be equal to that of the corresponding pixel in W.

3. For each pixel Z with value g in G, represent the corresponding pixel in the recovered image R as x and the value of the corresponding pixel Y in M as l, and conduct the following steps.

a. Obtain the same value a as that derived in step 3a of algorithm 1 by applying the same estimation technique used there.

b. Set b to be the value l.

c. Re-established p from q by setting  $p = Fa^{-1}(Fb(g))$ .

Set the value of x to be p.

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## IV. EXPERIMENTAL RESULTS

Fig.6 shows includes buttons like Add Watermark, Remove Watermark, Split Images, Watermark Key, and Set Up. Fig.7 shows Add Watermark button is to add the watermark image onto the original image. Remove Watermark is to retrieve the original picture from the watermarked image. Split images is to split the watermark image into two parts. Watermark key is the key which should be same while adding and removing the watermark key, if the key is not same then you will loss the content of the picture. Set up button is to set the logo position of the watermark picture onto the original picture. Also we can select either monochrome or transparent. Monochrome means the picture will be in either black color or white color. Transparent means the picture will be transparent

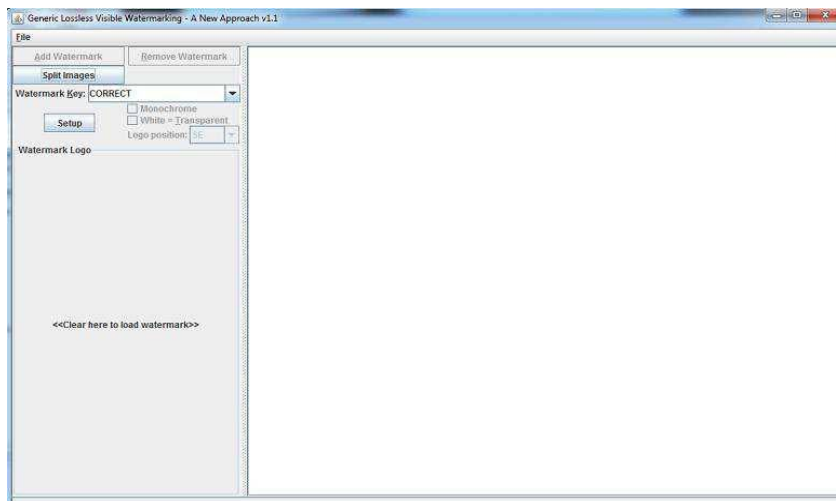


Fig.6 Main GUI Display

Added Watermark:

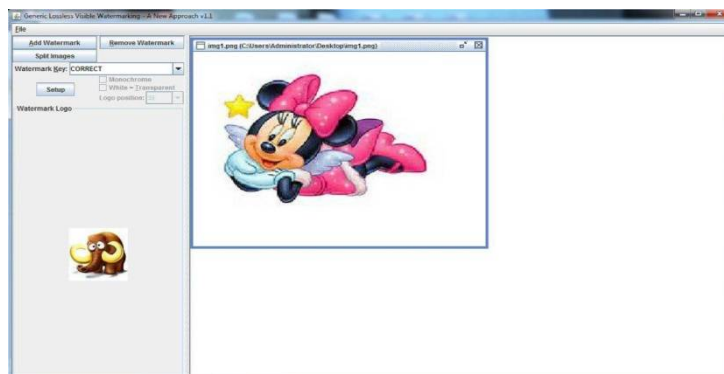


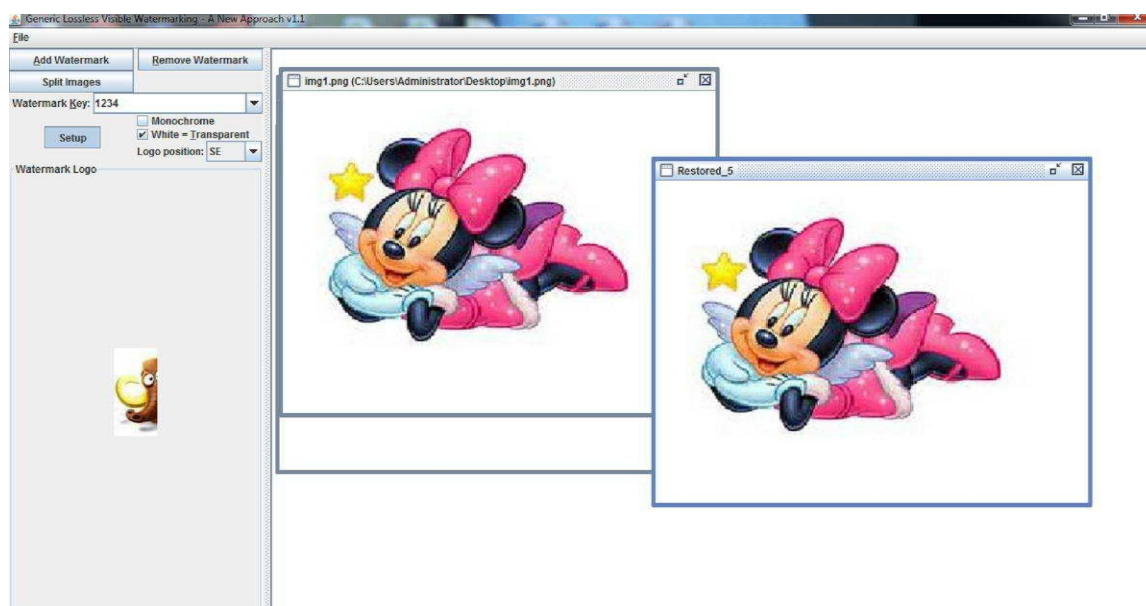
Fig.7 Watermark added

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Fig.8 shows outcomes of Add original picture and watermark picture. Click on the file menu and add the images. Once we are done adding, set the watermark key and logo position as per the requirements. Then add the watermark, Save image and then remove the watermark.



**Fig.8 Restoration**

### V. CONCLUSION

A method for reversible (previous state is restored) visible watermarking with lossless image recovery has been proposed. This technique uses one-to-one compound mapping that map image pixel values that of the desired watermark. Compound mappings allow mapped values to be controllable. Lossless visible watermarking is suggested by using appropriate compound mappings. The mappings are also demonstrated to be reversible for lossless recovery of the original (actual) picture. The approach is generic, leading to the possibility of attaching the different types of visible watermarks into cover pictures. The compound mapping allows different watermark to be embedded, they are - Monochrome Watermark-Translucent full-color ones These are embedded into color images. A translucent (semi transparent) watermark is clearly visible and visually pleasing, therefore much more appropriate than traditional transparent binary watermarks in terms of presenting effect and copyright declaration.

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