International Journal of Advanced Engineering & Innovative Technology (IJAEIT)
ISSN: 2348 7208
IMPACT FACTOR: 1.04

Modern Image Cryptography Using Hennon Map Equation

Mr Vitthal B. Kale and Prof Jyoti .S Raghatwan R.M.D.S.S.O.E Warje, Pune, India

Abstract—Image sharing has a several technique to transfer image over the network, but this technique used the diverse image media to secure image transmission. Secret sharing schemes hide the secret image in shares that are either printed or transparencies or encoded and in digital form. The share we can say that the as noise like pixel or meaningful image. But it will arouse suspicion and increase interception risk during transmission of the shares. That is visual secret sharing scheme suffer from a transmission risk problem for the secret itself and for the participants who are involved in the visual secret sharing scheme. To overcome that problem we proposed the natural image based visual secret sharing that shares secret images via various carrier media to protect the secret and the participants during the trans- mission phase. The proposed scheme can share one digital secret image over n-1 arbitrary selected natural images (called natural shares) and one noise like share. The natural shares can be photos or hand-painted pictures in digital form or in printed form. The noise like share is generated based on these natural shares and the secret image. The unaltered natural shares are diverse and innocuous, thus greatly reducing the transmission risk problem. We also propose possible ways to hide the noise like share to reduce the transmission risk problem for the share.

Index Terms—Stegnography, Alpha channel, Chaos sequence.

1 INTRODUCTION

Cryptography is a technique that encrypts a secret image into n shares, with each participant holding one or more shares. Anyone who holds fewer than n shares cannot reveal any information about the secret image. Stacking the n shares reveals the secret image and it can be recognized directly by the human visual system [1]. Secret images can be of various types: images, handwritten documents, photographs, and others. Sharing and delivering secret images is also known as a visual secret sharing scheme. The original motivation of VC(visual cryptography) is to securely share secret images in non-computer- aided environments; however, devices with computational powers are ubiquitous (e.g., smart phones). Thus, sharing secret images in digital environments has become an important issue today.

2 RE LATE D WO R K

The color secret and gray-level images to develop a user-friendly secret sharing scheme that add cover images into the meaningless shares [8]. To share digital images, visual secret sharing schemes use digital media as carriers, which makes the appearance of the shares more variable and more user- friendly. Several papers investigated meaningful halftone shares [11] and emphasized the quality of the shares more than the quality of the recovered images. These studies had serious side effects in terms of pixel expansion and poor display quality for the recovered images, although the display quality of the shares was enhanced. Hence, researchers make a tradeoff between the quality of the shares, the quality of the recovered images, and the pixel expansion of the images .In another research branch, researchers used steganography techniques to hide secret images in cover images [3]. Steganography is the technique of hiding information and making the communication invisible. In this way, no one who is not involved in the transmission of the information suspects the existence of the information. Therefore, the hidden information and its carrier can be protected. Steganography has been used to hide digital shares in VSS schemes. The shares in VSS schemes are embedded in cover images to create stegoimages. Although the shares are concealed totally and the stegoimages have a high level of user friendliness, the shared information and the stegoimages remain intercepted risks during the transmission

phase [2]. Recently, Chiu et al. tried to share a secret image via natural images [10]. This was a first attempt to share images via natural images; however, this work may suffer a problem the textures of the natural images could be disclosed on the share. Moreover, printed images cannot be used for sharing images in the previous scheme. So far, sharing visual secret image via unaltered printed media remains an open problem. In this study, we make an extension of the previous work in to promote its practicability and explore the possibility for adopting the unaltered printed media as shares.

3 PROBLEM DEFINITION

Today a lot of growth has been done in computer network, such as Internet also in Mobile communication, and Digital Multimedia applications such as Digital camera, handset video etc. has opened new opportunities in scientific and commercial applications. But it also led to many problems such as hacking, duplications and usage of digital information. Secret sharing scheme, visual cryptography can be used in a number of applications including access control.

3.1 Purpose

To study a system that will help to provide more security, that provide efficient way to transfer data over the network through the digital images.

3.2 Objective

The objective of the system is to provide more security by authenticating user while performing the activity. As well as it provides mechanism to verify legitimate user identity. Also the system helps to avoid fraudulent use of internet services by using diverse images.

4 SYSTEM ARCHITECTURE

4.1 Alpha channel watermarking

A digital watermark into a host is described alpha channel. Blending factors which is an alpha channel define the proportion of foreground also background colors which in turn are combined to result in an actual color for each pixel. There, is the blending factors corresponding to areas along with edges in the host image is of interest. The images first devide into sub images. A dominant edge found in any sub image which is used to divide that the every pixels on that block into three groups. Group of foreground-color only pixels, Group of background-color only pixels, That the group of background-foreground blended color of that pixels. The blending factors for the last pixels group are modified to embed each bit of a watermarking pattern. Because the modified pixels belong to the area around an image edge, change to the original image due to watermark embedding is less perceptible. The blending factors for the pixels in the last group are modified to embed each bit of a watermarking pattern. Because the modified pixels which is belong to the area around an image edge, change to the original image due to wa- termark embedding is less perceptible.

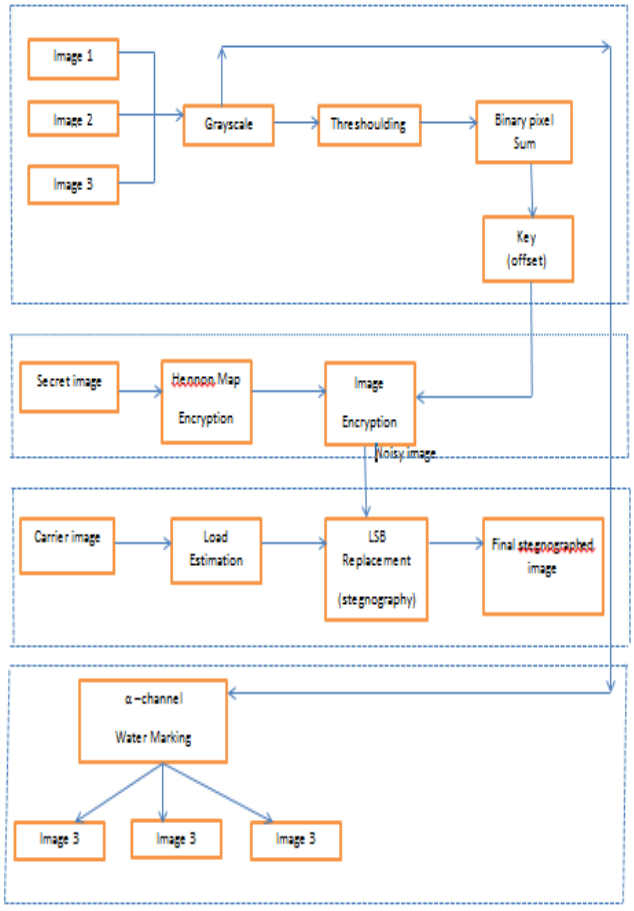


Fig.1. System Architecture

4.2 LSB replacement stegnography

The LSB (least-significant) bit based approach is a most useful and popular type of stegano- graphic algorithms in the spatial domain. How- ever we

found in most existing approaches, The choice of embedding positions within cover image mainly depends on a pseudo- random number generator without considering the relationship between the image con- tent itself and the size of the secret message. we expand the LSB matching revisited image steganography and propose an edge adaptive scheme which can select the embedding re- gions according to the size of secret message and the difference between two consecutive pixels in the cover image. For lower embed- ding bedding rates, only sharper edge regions are used while keeping the other smoother regions as they are. When the embedding rate increases, more edge regions can be released adaptively for data hiding by adjusting just a few parameters.

4.3 **Hennon map equation**

An adaptive fuzzy control method is presented to synchronize model- unknown discrete-time generalized Henon map. The proposed method is robust to approximate errors and disturbances, because it integrates the merits of adaptive fuzzy and the variable structure control. Moreover, it can realize the synchronizations of non-identical chaotic systems. The simulation results of synchronization of generalized Henon map show that it not only can synchronize model-unknown generalized Henon map but also is robust against the noise of the systems. These merits are advantageous for engineering realization.

4.4 Grayscale

Black and white (or monochrome) photography dates back to the mid-19th century. Despite the eventual introduction of color photography, monochromatic photography remains popular. If anything, the digital revolution has actually increased the popularity of monochromatic photography because any digital cam- era is capable of taking black-and-white photographs (whereas analog cameras required the use of special monochromatic film). Monochromatic photography is sometimes considered the sculpture variety of photographic art. It tends to abstract the sub- ject, allowing the phographer to focus on form and interpretation instead of simply reproducing reality. Because the terminology black-and-white is imprecise black- and-white photography actually consists of many shades of gray this article will refer to such images as grayscale.

4.5 Jarvis Halftonning(thresholding)

One of the oldest application of image processing is Halftonning, It is essential for the printing process. With the evolution of computers and their gradual introduction to typesetting, printing, and publishing, the field of halftoning that was previously limited to the so-called halftoning screen evolved into its successor digital halftoning [1]. Today the digital Halftonning plays a key role in almost every discipline that consist printing and displaying. Almost all newspapers, magazines, and books are printed with digital halftoning. Halftoning is used in image display devices capable of reproducing two-level outputs such as scientific work stations, laser printers, and digital types etters. The grayscale digital image consists of 256 gray levels, while the black and white printers only have one colored ink. So, there is a need to replace wide range of grayscale pixels for print- ers. These 256 levels of gray should somehow be represented by placing black marks on white paper. Halftoning is a representation technique to transform the original continuous tone digi- tal image into a binary image only of 1s and 0s consisting [2][3]. The value 1 means to fire a dot in the current position and 0 means to keep the corresponding position empty Since the human eyes have the low pass spatial frequency pros- perity, human eyes perceive patches of black and white marks as some kind of average grey when viewed from sufficiently far away. Our eyes cannot distinguish the dots patterns if they are small enough. Instead, our eyes integrate the black dots and the non-printed areas as varying shades of gray.

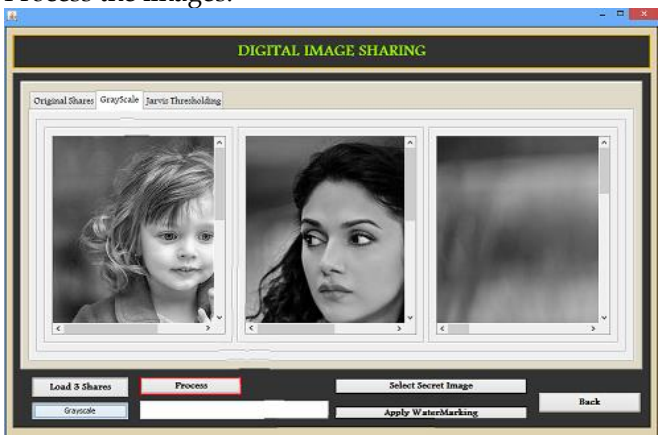
5 RESULT

"Modern image cryptography using chaos technique" is a digital way of sharing data in the form of image. With the help of chaos equations it becomes very secure from steg analysis To find random patterns and retrieve secret data.In this technique we are using the images to encryption on images, In this scenario there is three images that is used for the encryption of image and same images has been used to decryption. The image I1, I2, I3 this images are used for the generation of key this provide the security. If these shares combination used successfully then and then only the desired data should be view. Also there is an secret image this secret image should be encrypted the secret image I4 is that we have to encrypt as well as transfer to other end that is receiver end. There is possibility to used the other combination for the decryption but in this case the only

possible selected combination is used for the decryption and also for encryption. Carrier image I5 is especially used for the hiding the image which we we have to transfer or performing the planed or unplanned activity operation. This is uniqly identified with the help of watermarking. The below mentioned step has been implemented in the system.

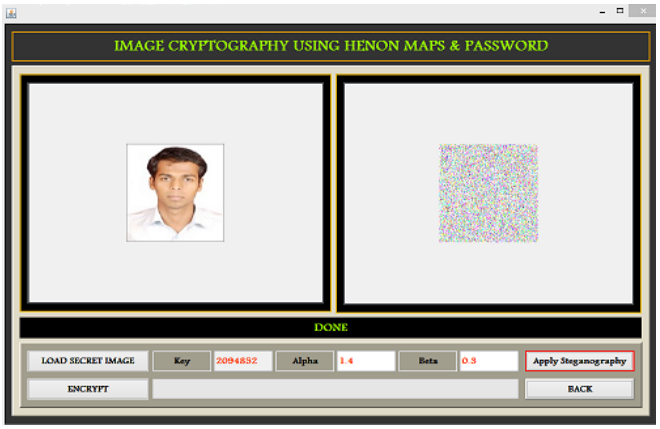
Loading the images:

Process the images:

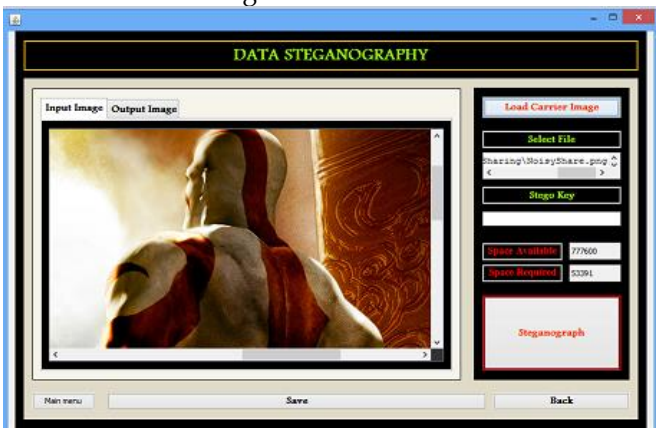


Encrypt the secret image:

Process the secret image:



Load the carrier image:



Decrypt the secret image:

6 CONCLUSION

The proposed architecture can be implemented according to feasibility of defined flow of algorithm. Additional watermarking and half

toning algorithm will play a vital role to provide enhanced level of security.

7 ACKNOWLEDGMENT

I hereby take this opportunity to express my heartfelt gratitude towards the people whose help was very useful to complete my dissertation work on the topic of Modern image cryptography using Hennon map equation. It is my privilege to express sincerest regards to my dissertation Guide Prof. Jyoti Raghatwan, for valuable inputs, able guidance, encouragement, whole- hearted cooperation and constructive criticism throughout the duration of my project work. I deeply express my sincere thanks to our Head of Department Prof. Veena lomate for her encouragement and allowing us to present the

8 REFEREN C ES

[1] M. Naor and A. Shamir , "Visual cryptography, in Ad- vances in Cryptology", vol. 950. New York, NY, USA: Springer-Verlag, 1995, pp.112.

[2] R. Z. Wang, Y. C. Lan, Y. K. Lee, S. Y. Huang, S. J. Shyu, and T. L. Chia, "Incrementing visual Cryptography using random grids", Opt. Commun, vol. 283, no. 21, pp. 42424249, Nov. 2010.

[3] P. L. Chiu and K. H. Lee, "A simulated annealing algorithm for general threshold visual cryptography schemes", IEEE Trans. Inf. Forensics Security, vol. 6, no. 3, pp. 9921001, Sep.2011.

[4] K. H. Lee and P. L. Chiu, " Image size invariant visual cryptography for general access structures subject to display quality constraints", IEEE Trans. Image Process. vol. 22, no. 10, pp. 38303841, Oct. 2013.

[5] G. Ateniese, C. Blundo, A. D. Santis, and D. R. Stinson,"Ex- tended capabilities for visual cryptography", Theoretical Comput. Sci., vol. 250, nos. 12, pp. 143161, Jan. 2001.

[6] C. N. Yang and T. S. Chen, "Extended visual secret sharing schemes: Improving the shadow image quality", Int. J. Pattern Recognit. Artif. Intell., vol. 21, no. 5, pp. 879898, Aug. 2007.

[7] K. H. Lee and P. L. Chiu.", An extended visual cryptog- raphy algorithm for general access structures, IEEE Trans. Inf. Forensics Security,vol. 7, no. 1, pp. 219229, Feb. 2012.

[8] Z. Zhou, G. R. Arce, and G. D. Crescenzo, "Halftone visual cryptog- raphy",IEEE Trans. Image Process. vol. 15, no. 8, pp. 24412453, Aug. 2006.

[9] T. H. N. Le, C. C. Lin, C. C. Chang, and H. B. Le, A high quality and small shadow size visual secret sharing scheme based on hybrid strategy for grayscale images ,Digit. Signal Process. vol. 21, no. 6, pp. 734745, Dec. 2011.

[10] X. Wu, D. Ou, Q. Liang, and W. Sun, "A user-friendly se- cret image shar- ing scheme with reversible steganography based on cellular automata", J. Syst. Softw., vol. 85, no. 8, pp. 18521863, Aug.