International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600

http://www.ijcsjournal.com Volume 5, Issue 1, No 14, 2017 ISSN: 2348-6600
Reference ID: IJCS-224 PAGE NO: 1395-1400

Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

STEGANOGRAPHY USING REVERSIBLE TEXTURE SYNTHESIS

G.RAJESHWARI1*, Dr.S.SUBBAIAH2*
1P.G & Research Department of Computer Science,
2 Asst. Professor Department of Computer Science and Applications,
Vivekanandha College of Arts and Sciences for Women. (Autonomous), Tiruchengode,
Namakkal-637 205, Tamil Nadu, India.
smileysindhuIT.gjss@gmail.com
subbunaren@yahoo.com

ABSTRACT- Steganography is the science and art of covert communication, which aims to hide the secret messages into a cover medium while achieving the least possible statistical detect ability. We propose a novel approach for steganography using a reversible texture synthesis. A texture synthesis process resample's a smaller texture image, which synthesizes a new texture image with a similar local appearance and an arbitrary size. The texture synthesis process into steganography to conceal secret messages. In contrast to using an existing cover image to hide messages, our algorithm conceals the source texture image and embeds secret messages through the process of texture synthesis. This allows us to extract the secret messages and source texture from a steganography synthetic texture. First, our scheme offers the embedding capacity that is proportional to the size of the steganography texture image. Second, a steganography algorithm is not likely to defeat our steganographic approach. Third, the reversible capability inherited from our scheme provides functionality, which allows recovery of the source texture. Experimental results have verified that our proposed algorithm can provide various numbers of embedding capacities, produce a visually plausible texture images, and recover the source texture.

Keywords Data embedding, example-based approach, reversible, steganography, texture synthesis

I.INTRODUCTION

In the last decade many advances have been made in the area of digital media, and much concern has arisen regarding steganography for digital media. Steganography is a singular method of information hiding techniques. It embeds messages into a host medium in order to conceal secret messages so as not to arouse suspicion by an eavesdropper.

International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
Since 2012
http://www.ijcsjournal.com Volume 5, Issue 1, No 14, 2017 ISSN: 2348-6600
Reference ID: IJCS-224 PAGE NO: 1395-1400
Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

A typical steganographic application includes covert communications between two parties whose existence is unknown to a possible attacker and whose success depends on detecting the existence of this communication In general, the host medium used in steganography includes meaningful digital media such as digital image, text, audio, video, 3D model, etc.A large number of image steganographic algorithms have been investigated with the increasing popularity and use of image steganographic algorithms adopt an existing image as a cover medium.

II.DIGITAL IMAGE PROCESSING

This means Least Significant Algorithm. In LSB algorithm, the message bit is taken from the message byte and then that particular bit will be embedded inside the least significant bit of an image or video or audio file. This is done because.

1. The message embedded in the least significant bit of an image file will not draw the suspicion of the hacker as the minute difference that would be made in the pixel value of the image file will not be perceived by the normal naked human eye.
2. The message that will be embedded in the LSB of an audio file will not create suspicion to the hacker as that change would not be perceived by the human ear.
3. The same concept works out even with video file.

However, there are few weaknesses of using LSB. It is very sensitive to any kind of filtering or manipulation of the stego-image .Scaling, rotation, cropping, addition of noise, or lossy compression to the stego-image will destroy the message. On the hiding Therefore, if this method causes someone to suspect something hidden in the stego-image, then the method is not success.

Disadvantages Low robustness to malicious attacks

- Vulnerable to accidental or environmental noise
- Low temper resistance

We use DES (Data Encryption Standard), Triple DES (Triple Data Encryption Standard), RSA (Rivest-Shamir-Adleman) Algorithms to embed the data. These algorithms are better than LSB Algorithms. An AVI (Audio Video Interleave) fie is nothing but a sequence of high resolution image called frames. It is possible to collect all the frames in bitmap format. Each frame consisting of three channel of RGB. After collecting the frame we perform DCT (8x8 block) on any channel (say R Channel) of the frames and embed the secret information bits in selected higher order coefficients. Each frame is processed by 8x8 Inverse DCT block processing and the combined to get AVI with hided message.

Decoding is done in reverse process of encoding. First each frame is extracted from just created AVI. Perform 8x8 DCT block processing on the channel where secret information was embedded earlier (R-channel here) and secret bit information's are extracted by subtracting from original DCT block processed values.

The advantage of proposed over cryptography alone, is that messages do not attract attention to themselves. Plainly visible encrypted messages-no matter how unbreakable-will arouse suspicion, and

International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
Since 2012
http://www.ijcsjournal.com Volume 5, Issue 1, No 14, 2017 ISSN: 2348-6600
Reference ID: IJCS-224 PAGE NO: 1395-1400
Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

may in them be incriminating in countries where encryption is illegal. Therefore, whereas cryptography protects the contents of a message, steganography can be said to protect both messages and communicating parties.

Advantages

- Resistance to brute force attacks.
- Eliminate Security Issues.
- User Friendly

III. LITERATURE REVIEW

Minimizing Additive Distortion in Steganography Using Syndrome-Trellis Codes

This paper proposes a complete practical methodology for minimizing additive distortion in steganography with general (no binary) embedding operation. Let every possible value of every steganography element be assigned a scalar expressing the distortion of an embedding change done by replacing the cover element by this value. The total distortion is assumed to be a sum of per-element distortions. Both the payload-limited sender (minimizing the total distortion while embedding a fixed payload) and the distortion-limited sender (maximizing the payload while introducing a fixed total distortion) are considered. Without any loss of performance, the no binary case is decomposed into several binary cases by replacing individual bits in cover elements. The binary case is approached using a novel syndrome-coding scheme based on dual convolution codes equipped with the Vitter algorithm. This fast and very versatile solution achieves state-of-the-art results in steganographic applications while having linear time and space complexity w.r.t. the number of cover elements. We report extensive experimental results for a large set of relative payloads and for different distortion profiles, including the wet paper channel. Practical merit of this approach is validated by constructing and testing adaptive embedding schemes for digital images in raster and transform domains. Most current coding schemes used in steganography (matrix embedding, wet paper codes, etc.and many new ones can be implemented using this framework.

A.F5 – A Steganography Algorithm (2001)

Many steganographic systems are weak against visual and statistical attacks. Systems without these weaknesses offer only a relatively small capacity for steganographic messages. The newly developed algorithm F5 withstands visual and statistical attacks, yet it still offers a large steganographic capacity. F5 implements matrix encoding to improve the efficiency of embedding. Thus it reduces the number of necessary changes. F5 employs per mutative straddling to uniformly spread out the changes over the whole steganography

B.Statistically Steganography. Dead End Challenges and Opportunities (2007)

The goal of this paper is to determine the steganographic capacity of JPEG images (the largest payload that can be undetectably embedded) with respect to current best steganalytic methods. Additionally, by testing selected steganographic algorithms we evaluate the influence of specific design elements and principles, such as the choice of the JPEG

International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
http://www.ijcsjournal.com Volume 5, Issue 1, No 14, 2017 ISSN: 2348-6600
Reference ID: IJCS-224 PAGE NO: 1395-1400
Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

compressor, matrix embedding, adaptive content-dependent selection channels, and minimal distortion steganography using side information at the sender. From our experiments, we conclude that the average steganographic capacity of grayscale JPEG images with quality factor 70 is approximately 0.05 bits per non-zero AC DCT coefficient.

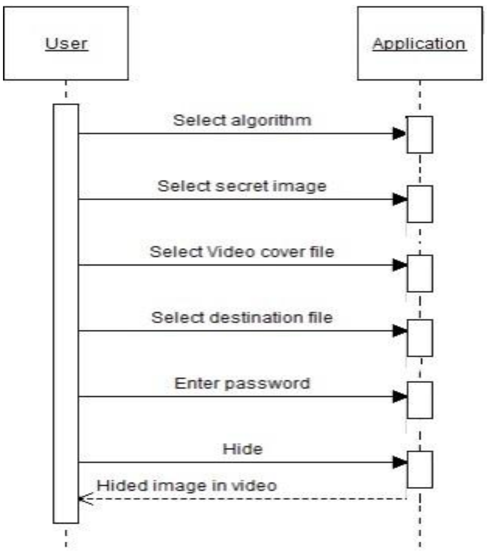
C.Modified Matrix Encoding Technique for minimal distortion Steganography (2006)

It is well known that all information hiding methods that modify the least significant bits introduce distortions into the cover objects. Those distortions have been utilized by steganalysis algorithms to detect that the objects had been modified. It has been proposed that only coefficients whose modification does not introduce large distortions should be used for embedding. In this paper we propose an efficient algorithm for information hiding in the LSBs of JPEG coefficients. Our algorithm uses modified matrix encoding to choose the coefficients whose modifications introduce minimal embedding distortion. We derive the expected value of the embedding distortion as a function of the message length and the probability distribution of the JPEG quantization errors of cover images. Our experiments show close agreement between the theoretical prediction and the actual embedding distortion. Our algorithm can be used for both steganography and fragile watermarking as well as in other applications in which it is necessary to keep the distortion as low as possible.

D.A human-oriented image retrieval system using interactive genetic algorithm (2002)

This paper gives an overview idea of retrieving images from a large database. CBIR is used for automatic indexing and retrieval of images depending upon contents of images known as features. The features may be low level or High level. The low level features include color, texture and shape. The high level feature describes the concept of human brain. The difference between low level features extracted from images and the high level information need of the user known as semantic gap. A Single feature can represent only part of the image property. So multiple features are used to enhance the image retrieval process. This paper has used color histogram, color mean, color structure descriptor and texture for feature extraction. The feature matching procedure is based on their Euclidean distance.

IV.HIDING AND RETRIEVING IMAGES AND VIDEO



International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600

http://www.ijcsjournal.com Volume 5, Issue 1, No 14, 2017 ISSN: 2348-6600
Reference ID: IJCS-224 PAGE NO: 1395-1400

Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

Fig 1 In this diagram how processes operate with one to another in what order. It is a construct of a Message sequence chart.

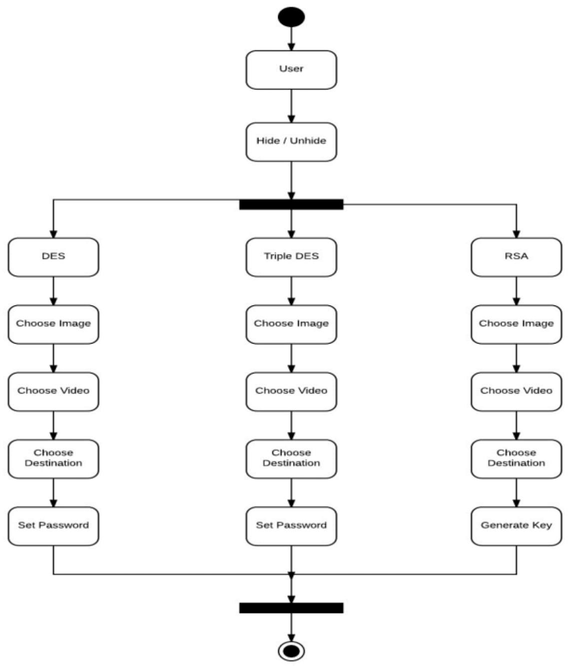


Fig 2 In this representation of workflow of step wise activities and an actions with support for choice, iteration and concurrency.

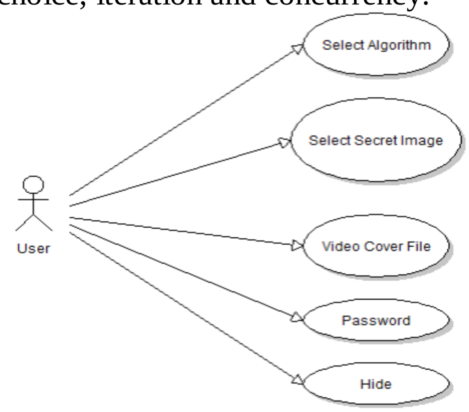


Fig 3 It representation of a user's interaction with the system that shows the relationship between the user and the different use case in which the user is involved

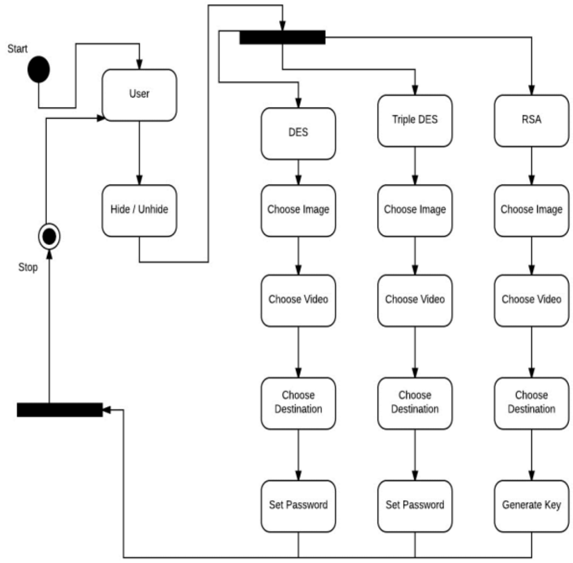


Fig 4 In this diagram computer related fields to describe the behavior of systems.

V.CONCLUSION

We conclude that since the texture synthesis can synthesize an arbitrary size of texture images, the embedding capacity which our scheme offers is proportional to the size of the stego texture image Thus it can be considered to be the most critical stage in achieving a successful new system and in giving the user, confidence that the new system will work and be effective.

International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
Since 2012
http://www.ijcsjournal.com Volume 5, Issue 1, No 14, 2017 ISSN: 2348-6600
Reference ID: IJCS-224 PAGE NO: 1395-1400
Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

VI.REFERENCES

[1] N. Jhanwar, S. Chaudhuri, G. Seetharaman, B. Zavidovique," Content Based Image Retrieval Using Motif Cooccurence Matrix," Image Vis.Comput., vol. 22, no. 14, pp. 1211–1220, Dec. 2004.

[2] H.-W. Yoo, H.-S. Park and D.-S. Jang, "Expert system for color image retrieval," Expert Syst. Appl., vol. 28, no. 2, pp. 347–357, Feb. 2005.

[3] E. J. Delp and O. R. Mitchell, "Image coding using block truncation coding," IEEE Trans. Commun., vol. COM-27, no. 9, pp. 1335–1342, Sep. 1979.

[4] C-C Lai and Y-C Chen, "A user-oriented image retrieval system based on interactive genetic algorithm," IEEE Trans. Instru. Measur, vol. 60, no. 10, pp. 3318-3325, Oct.2011.

[5] S.-B. Cho and J.-Y. Lee, "A human-oriented image retrieval system using interactive genetic algorithm", IEEE Trans. Syst., Man, Cybern. A, Syst.,Humans, vol. 32, no. 3, pp. 452–458, May 2002.

[6]V.Srikanth, C.Srujana, P.Nataraju, S.Nagarajuand Ch. Vijayalakshmi, "Image gathering using both color and texture features", IJECT, vol. 2, SP-1, pp. 55-57, Dec. 2011.

[7] S-Pattanaik, D.G.Bhalke, "Beginners to content based image retrieval," IJSRET, vol. 1, issue 2, pp.40-44,May 2012.

[8] S.-S., Sebastian-S., "Image retrieval with interactive query description and database revision," unpublished.

[9] S.-S., Sebastian-S., "Content based image retrieval based on database revision," International Conference on machine vision and image processing, Dec 2012.