International Journal of advancement in electronics and computer engineering (IJAECE)
Volume 7, Issue 1, January 2018, pp.106-110, ISSN 2278 -1412

Result Analysis of Reversible Texture Synthesis Using Steganogrphy.

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Abstract *– Major necessity for any steganography method is to decrease the changes happening in the cover image by the data embedding process. Steganogrphy is that the profession of concealing a privacy message among a declared medium like image, audio or video. A texture creation technique re-samples a less significant texture image that synthesizes a latest texture image with the same native appearance and arbitrary size. This paper on steganogrphy relating to numerous technologies is studied within which steganogrphy employing a reversible texture synthesis with quality assessment is being targeted. A texture synthesis method takes the small unit of the texture image that results in a brand new texture image with a smaller portion of previous texture and with arbitrary size. This paper focus on the analysis of steganographic techniques established a impact full system to.*

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

I. Introduction

Steganography is taken into account a popular topic since web becomes the most common method of communication. Steganography is that the art and science of hiding communication. A steganographic system therefore embeds hidden content in ordinary cover media therefore as to not arouse an eavesdropper's suspicion. the most classes of file formats which will be used for steganography are: Text Steganography, Image steganography, Audio steganography, and Protocol steganography. Steganography [1] a singular methodology of data activity techniques. It insert messages into a bunch means so as to hide secret messages thus as to not stimulate thought by an eavesdropper [2]. The data hiding method through a steganographic system starts by distinctive a canopy medium redundant bit. The embedding method creates a stego medium by replacement these redundant bits with knowledge from the hidden message. Textures are vital for a large type of applications in camera work and image process.

Texture pictures typically return from scanned pictures, and therefore the accessible images could also be too tiny to hide the complete object surface. in this state of affairs, an easy tiling can introduce unacceptable artifacts within the types of visible repetition and seams. Patch-based algorithms describe the steganography and reversible texture synthesis [3].Patch-based algorithmic rule will increase the standard of the image of pixel based mostly synthetic texture. In most of the image steganographic strategies, uses the present image as their cover medium. This leads to 2 drawbacks. Since the scale of the quilt image is fastened, embedding an oversized secret message can ends up in the distortion of the image. so a compromise ought to be created between the scale of the image and therefore the embedding capability to enhance the standard of the quilt image. This technique improves the image quality of pixel-based artificial textures as a result of texture structures within the patches ar maintained. A patch represents a picture block of a source texture wherever its size is user-specified.

II. Related work

II.1. Lossless Data Embedding Capacity in the LSB

A simplification of the recognized least significant bit (LSB) variation is predictable for the reason that the data-embedding procedure, that introduces further operational points on the capacity-distortion curve. The length of secret message is derived by examine the lossless capacity in the LSB and shifted LSB plane. Randomizing the LSBs in the decreasing order of lossless capacity in the LSB Plane. Thus, the lossless capacity used to measure the degree of randomization of the LSB plane. This methodology is employed for Steganography detection. For this technique, are often reliably observe the presence of secret messages within the images. If the set of tiles is made enough and there's

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no periodicity, we are able to within the tiles anything we wish like texture, geometric primitives etc.

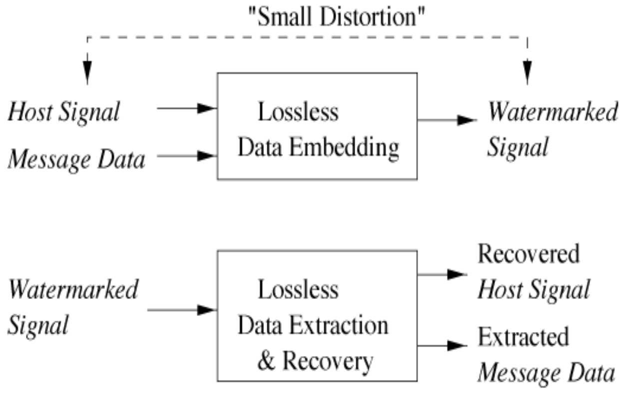

Fig.1. Lossless data embedding, extraction, and recovery

II.2. *A Non-Parametric Method for Texture Synthesis*

The texture synthesis method emerges a new image outward from an initial seed; take into account one pixel at a time. the target of this methodology is to preserve local structure and produces good results for a large form of synthetic and real-world textures. The algorithmic rule considers texture, pixel by pixel, outwards from an initial seed. First, selected one pixel so the model captures high frequency info as possible. Using probability tables for the distribution of single pixel is synthesis the method by using all potential contexts.

II.3. *Markov Random Field (MRF) Method*

Fast Texture Synthesis using Tree-structured Vector quantisation, Author Li- Yi Wei and marc Levoy present an easy formula that may synthesize completely different form of textures. The inputs to the algorithmic rule contain any random noise image with user species size and an example texture patch. To create the visually plausible image like algorithmic rule makes modifications in random noise image. Since this method need only texture patch it becomes edibles and simple to use. There are 2 major parts in the algorithmic rule, the looking algorithmic rule and multi resolution pyramid. the benefits of this algorithmic rule are its image processing speed and image quality: The algorithmic rule provide better quality of synthesized image texture than previous techniques, while it increase the computation speed twice faster order of magnitude than older approaches that generate same result as this algorithmic rule.

II.4. *Wang Tile Method*

A simple system for patch with a small set of Wang Tiles. The tiles are made up with patterns, texture or geometry that when aggregate create a representation which is continuous. Wang Tiles have square like structure and edges have particular color. When shared edges of different tiles have same color than this tile called as valid tile. This mention technique is used to create arrangement of terrains objects or plants. In This project show how the environment like terrain can be shown easily by lighting the each Wang tiles which contain the geometry like structure.

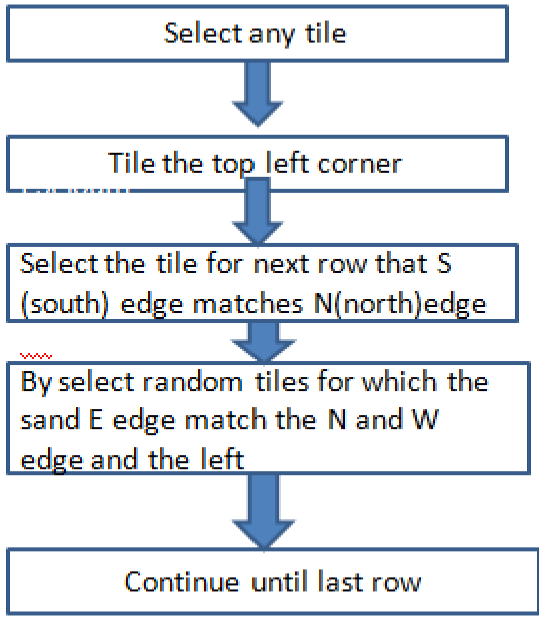

Fig.2: Wang Tile Method

III. Proposed Method

III.1. 2D-Discrete wavelet transformation (2D-DWT)

A few systems can change a picture into the recurrence area, for example, DCT (discrete cosine change), DFT (discrete Fourier change), and DWT (discrete wavelet change). DWT is extremely viable to immaculate recreation of a disintegrated picture. Wavelet examination deteriorates picture data into estimation coefficients cA(LL1) and subtle elements coefficients grids cH(HL1), cV(LH1) and cD(HH1) (even, vertical, and corner to corner, separately) got by wavelet decay of the info picture The subtle elements coefficients named HL1, LH1, and HH1 speak to the finest scale wavelet coefficients. To get the following coarser scaled wavelet parts, the estimation coefficients cA (LL1) is further decayed and fundamentally sub-inspected. This procedure is rehashed a few times, which is dictated by the application nearby. The estimation sub-sign demonstrate the general pattern of pixel qualities. Then again, changes in the points of interest part don't impact fundamentally on a picture. We utilized vertical (LH) of third level DWT deterioration which builds the SNR by diminishing the impact of commotion on the spread picture.

III.2. HAAR wavelets

The first DWT was invented by Hungarian mathematician Alfred Haar. For an input represented by a list of 2^n numbers, the Haar wavelet transform may be considered to pair up input values, storing the difference and passing the sum. This process is repeated recursively, pairing up the sums to provide the next scale, which leads to $2^n - 1$ differences and a final sum.

III.3. Daubechies wavelets

The most commonly used set of discrete wavelet transforms was formulated by the Belgian mathematician Ingrid Daubechies in 1988. This formulation is based on the use of recurrence relations to generate progressively finer discrete samplings of an implicit mother wavelet function; each resolution is twice that of the previous scale. In her seminal paper, Daubechies derives a family of wavelets, the first of which is the Haar wavelet. Interest in this field has exploded since then, and many variations of Daubechies original wavelets were developed.

III.4. The Dual-Tree Complex Wavelet Transform (ℂWT)

The Dual-Tree Complex Wavelet Transform (ℂWT) is a relatively recent enhancement to the discrete wavelet transform (DWT), with important additional properties: It is nearly shift invariant and directionally selective in two and higher dimensions. It achieves this with a redundancy factor of only 2^d substantially lower than the undecimated DWT. The multidimensional (M-D) dual-tree ℂWT is non separable but is based on a computationally efficient, separable filter bank (FB).

IV. Result

Results occur in proposed work which is usually implemented on a graphic user interface window in matlab and shown as a figure or snapshot of the run program step by step.

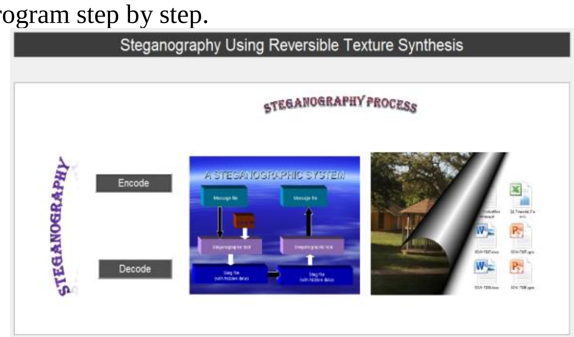

Figure 3 GUI image for Steganogrphy using reversible texture synthesis

Figure 3 First graphic user interface window in which Stenography process is shown. In Stenography complete process occurred in the proposed work is shown into a single window for presentation. In which we see encoder, decoder, and Steganogrphy system with text file hidden on image also.

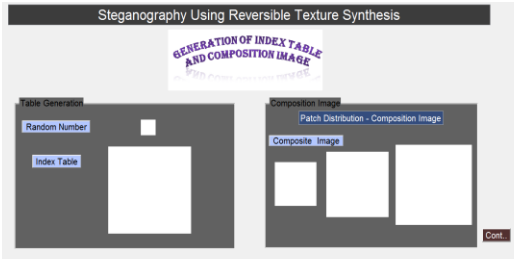

Figure 4 Generation of index table and composition image

Figure 4 shows the Generation of index table and composition image for the Steganogrphy using reversible texture synthesis. This process occurs after the click on embedding process button on previous GUI window. Random number input window for generate index table

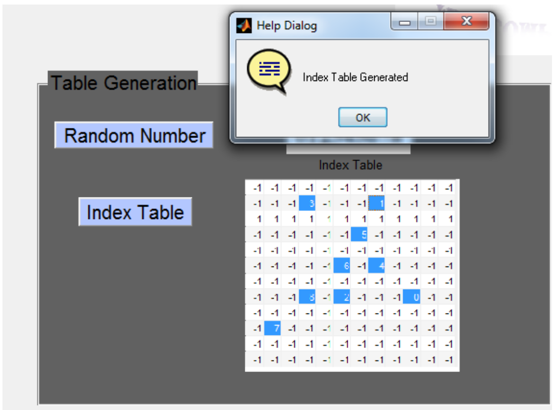

Figure 5 Index table for random number input should be generated

After that for next step we have to click on Random number which gives us a popup window in which we select randomly any number after that index table generation is processed. which is shown in figure 5 Index table for random number input should be generated.

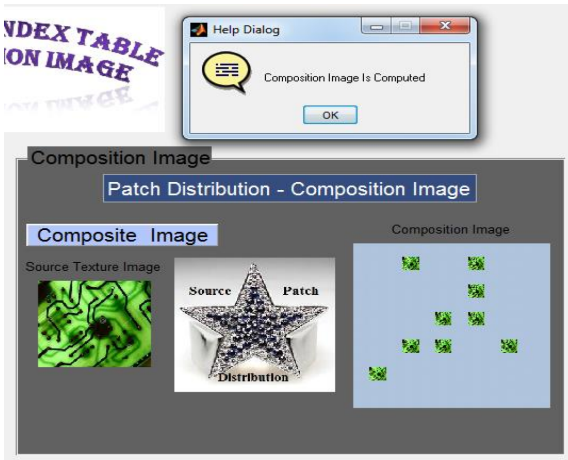

Figure 6 Composite image for Patch distribution has been generated

In figure 6 Composite images for Patch distribution has been generated which is generated on behalf on index table. This process is known by Patch distribution because of this process a image is selected for cover and index by index table random variable no. and generate composition image.

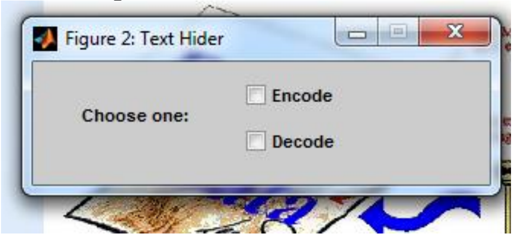

Figure 7 Text hider

After click on an encode button on a popup window is generated which shows two option in which one have to chosen which is taken for encoding process of image selected. In figure 7 Text hider window is shown.

After choosing encoding process a window is pop up which is known as message space for hiding secret message, Figure 8 shows the hiding of message should have limited message length

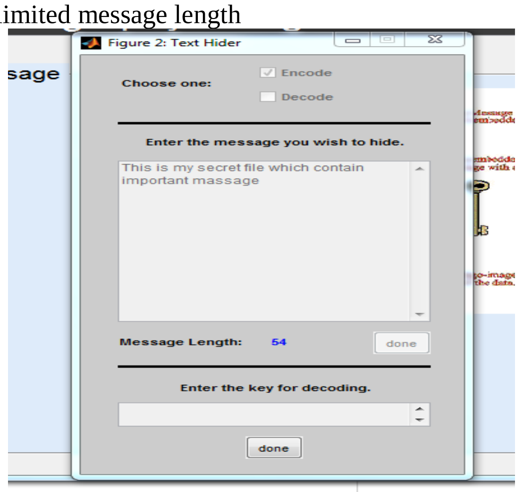

Figure 8 Decoding key selection process

In figure8 programmer/user select the desired key for message decoding

Figure 9 Notification Message for encoding process

Figure 9 shows the Notification Message for encoding process which is generated after completion of embedded process.

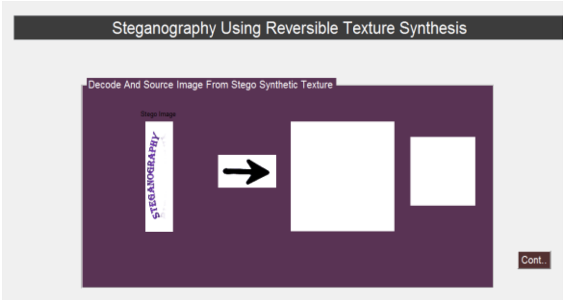

Figure 10 Decode and source image from stego synthetic texture

In above figure 10 Decode and source image from stego synthetic texture. In which all patches of image for data transmission securely with the data hide on image should be decoded and process is shown in above figure.

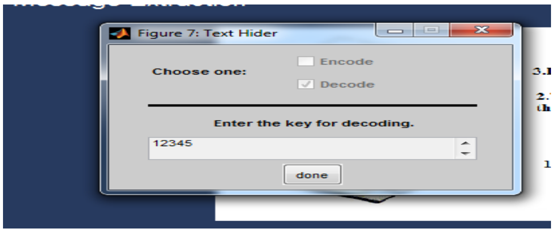

Figure 11 Decoding key entering window

After Decoding process has been done decoding key should be required to show original secret message sent by sender.

Figure 12 Decoded message after decoding process

In figure 12 shows the original message sent by user securely received at receiver side by entering password for decoding message which is hiding on image.

V. Conclusion

The steganographic algorithmic rule using reversible texture synthesis is Implemented. The system conjointly provides reversibility to retrieve the first source texture from the stego synthetic textures. In proposed work a reversible steganographic algorithm using texture synthesis. Given an original source texture, our scheme can produce a large stego synthetic texture concealing secret messages. To the best of our knowledge, we are the first that can exquisitely weave the steganography into a conventional patch-based texture synthesis. Our method is novel and provides reversibility to retrieve the original source texture from the stego synthetic textures, making possible a second round of texture synthesis if needed. With the two techniques we have introduced, our algorithm can produce visually plausible stego synthetic textures even if the secret messages consisting of bit "0" or "1" have an uneven appearance of probabilities.

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