Various Techniques in Video Steganography - A Review

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Abstract— Now a day's Data handling very risk in internet against intruder. In case data means like text, image, audio, video etc. Stegnography is one of the best methods for secret and securely sharing data's. Real meaning for Steganography is the art of hiding the message from sender to receiver very secure method. Secure video Steganography is a challenging task of sending the embedded information to the receiver without being detected. Basically Steganography using text, image, audio, video. This paper presents a review on various techniques used for video Steganography. Here we are review about video Steganography using various techniques are discussed like DCT, DWT, LSB techniques, IWT. This paper is very helpful for video Stegnography researcher to know whether work is already available or not.

Keywords— *DCT, DWT, LSB, IWT.*

I. INTRODUCTION

Video

Video is the technology of electronically recording, transmitting, storing, capturing, and reconstructing a sequence of still images representing scenes in motion [13]. Following are important characteristics of the video. In videos Frame rate, the number of still pictures per unit of time of video the ranges from -six or eight frames per second (frame/s).The size of a video image is measured in pixels for= digital video. Horizontal scan lines and vertical lines of resolution for = analog video. Aspect ratio describes the dimensions of video screens and video picture elements. All popular video formats are rectilinear, and so can be described by a ratio between width and height [14]. Video quality can be measured with formal metrics like PSNR or with subjective video quality using expert observation.

Video Stegnography

Video Steganography is the art of hiding information in ways that avert the revealing of hiding messages in videos. Actually message like text, image, audio, video and etc. It is focused on spatial and transform domain. Spatial domain algorithm directly embedded information in the cover image with no visual changes with good quality. The result of algorithms has the advantage in Steganography capacity. Transform domain algorithm is embedding the secret information in the transform space. This kind of algorithms has the advantage of good stability, but the disadvantage of small capacity.

Video Steganalysis:

In modern world, information hiding in video streams has played an important role in the steganography and correspondingly video steganalysis techniques are catching attention of the security. Basically steganalysis, to detect the existence of secret messages [31] .

II. VARIOUS TECHNIQUES OF VIDEO STEGNOGRAPHY

The major work of video Steganography is hide secret message without affecting the visual quality, structure and content of the video file. Here following methods are achieved the above things.

A. Video Steganography based on Non-uniform rectangular partition

Non-uniform rectangular partition algorithm is used steganography in the uncompressed video. That means it try to hide a video stream in another video stream with almost the same size. Proposed work, each frame of both videos as the images and apply the image steganography for each frame with some necessary mechanism. Major condition of the algorithm is host video stream is F, hidden video stream is H. The frame length of F is longer than or equal to that of H. Each frame of the secret video will be Non-uniform rectangular partitioned and the partitioned codes obtained can be an encrypted version of the original frame. These codes will be hidden in the Least 4 Significant Bits of each frames of the host video [8].

B. Compressed Video Steganography using TPVD

The proposed method data hiding process are executed fully in the compressed domain. Algorithm works as data are embedded in the macro blocks of I frame with maximum scene change and in block of P and B frames with maximum magnitude of motion vectors. To enlarge the capacity of the hidden secret information and to provide an imperceptible stego-image for human vision, a novel stegnographic approach called tri-way pixel-value differencing (TPVD) is constructed from all pixel pairs and embedded with secret data is generated. Though decompression is not required. Proposed method provides high capacity and imperceptible stego-image for human vision of the hidden secret information [2].

C. An adaptive scheme for compressed video steganography

Proposed method, for each I-VOP, the blocks with high spatial changes were selected and secret data were embedded in some AC coefficients. For P-VOP and B-VOP, secret bits were embedded in horizontal and vertical components of motion vectors with large magnitude which represented high temporal changes. The method did not require the original video signal or bit stream for data extraction. The algorithm was performed for different bit rates and experimental results indicated that this algorithm had high visual quality and embedding capacity [10].

D. Video steganography by LSb substitution using different polynomial equations

Least significant bit (LSB) insertion is an important approach for embedding information in a carrier file. Least significant bit (LSB) insertion technique operates on LSB bit of the media file to hide the information bit. Proposed method, Data hiding scheme will be developed to hide the information in specific frames of the video and in specific location of the frame by LSB substitution using polynomial equation. Here the information will be embedded based on the stego key. Key is used in the form of polynomial equations with different coefficients. By using this capacity of embedding bits into the cover image can be increased [3].

E. Video stegnography using 32 *32 vector quantization of DCT

The proposed method of video stegnography which has been achieved with 32*32 vector quantization of DCT. Proposed work first of all the video has been sliced into different number of images. Then all the sliced images are passed to the 32*32 pixel management procedure followed by the LSB quantization method thorough which we find the vacant spaces of the images. The text message to be embedded is converted to the ascii encoded bits to make it compatible according to the vector table of the current segment of the video. The idea is to fill those bits first which occupy low intensity and if still there are bits left to be embedded then it to be embedded into high intensity bits .The scheme of embedding bits are finally performed by IDCT [4].

F. A high capacity video steganography based on integer wavelet transform

The proposed system utilizes Integer wavelet transformation in cover image so as to get the stego-image. The capacity of the proposed algorithm is increased as the only approximation band of secret image is considered. The extraction model is actually the reverse process of the embedding model. Experimental results show that proposed method gets stego-image with high capacity and security with certain robustness. Integer wavelet transforms are used to exploit the spatial and temporal correlation in and between the video frames or minimizing the embedding distortion. Another achievement of a wavelet basis is that it supports multi resolution [5].

G. Video steganography technique using dynamic cover generation

In this research we propose a new stegnographic system wherein the cover media itself is generated by the system instead of using an existing cover and partial of data is the cover itself and rest is embedded inside the cover. This makes steganalysis more difficult as what data cover itself means is difficult to judge thus improving security [7].

III. Conclusions

Hiding a message with steganography methods reduces the chance of a message not visible for intruders. This paper explores a small review about of the art of video steganography. This paper presents various types of video stegnography techniques. Comparing the performance of video stegnographic technique is difficult unless identical data sets and performance measures are used. The video stegnographic techniques are obtained good for certain applications like security technologies in videos. This paper provides effective review and some guidelines on the design of a video stegnographic system. Also this paper very helpful for know the video stegnographic in current trends and to develop the next level of the video stegnographic techniques for researchers.

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