# A Survey of Video Steganography Techniques

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**Abstract – Internet is the media due to which is possible to transfer data from one place to another place with very high speed. But it is very risky to transfer data over internet. Hence to maintain privacy and to prevent an unauthorized person from extracting information steganography technique is used. Steganography is the technique of hiding secret data. The secret information like text, image, audio and video. This secret information will be hide in the text, image, audio and video files. Hide secret information in video file is called video steganography. Research working on video steganography with different of methods like Least Significant Bit (LSB), Modified Least Significant Bit. Discrete Cosine Transform (DCT), Hash-Based Least Significant Bit (HLSB). This paper presents an overview of present methods, with the goal of collecting together the research efforts in this field, to characterize the achievements, and to identify future research directions.**

**Index Terms – Video steganography, Data Hiding, Encryption, PSNR.**

## 1. INTRODUCTION

Now a days, the increment in the unauthorized attacks, security breaks and unwanted access. So it is much important to protect or secure our data or information from the hackers or unwanted access. While in cryptography, the message has been encrypted but when communicate with third party, the encrypted message can be decrypted very easily and destroyed. While in steganography, it hides the secret data or information in some cover source in such a way that the data is also hidden so that while communicating unwanted access cannot be done easily between two parties.

Video steganography is a method of hiding data or information into frames in video format. Video is a combination of frames or pictures used for hiding text messages. There are different techniques used to hide the data in different frames of video, which is secure from human eye. Different methods directly embedded data in the cover frame with no changes with good quality. Now a days, data hiding in video frames plays important role in steganography.

## 2. RELATED WORK

### 2.1 EXISTING METHODS 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.

#### 2.1.1 LSB substitution using polynomial equations

In [5] Poonam V Bodhak have proposed an approach which is based on Least data transmission with high portability and high consistency. Here, the data and text have been read which is to be hidden in the cover frames or images. The text have been converted into binary form and each pixels of the frame have been calculated. Each bit of the text message is to be replaced with the frames of LSB. significant bit (LSB) insertion. Their objective was to establish a secure way of to retrieve the message the method has been written. The frame has been read and each pixel of frame is calculated. Now the Retrieve bits are convert each 8 bit into character. The method is highly portable. Its disadvantage is easily to implement and does not stand up to compression. Suitable for lossy compression.

#### 2.1.2 Embedding and Extracting Algorithm

In Embedding algorithm, they first read the cover video. Now the video has been segmented into frames and compute the histogram of each frame. If the histogram value of frame is greater or equal to histogram constant value then determine the parameters used in recovery stage. Now embed the hidden data into frame and get the stego image. Combine each frame to get the video and send to the other side with whom you want to communicate.

In Extracting algorithm, first of all read the stego video and segment the stego video into frames. Now read the recovery parameters of frame1 and determine appropriate frames. Extract or de-embed the hidden or secret data form frame. Gaining the secret message and we get back the hidden message sent from other side. This technique is only apply on compression video. It is not sufficient for uncompress video because quality of can be loss in embedding process.

#### 2.1.3 Hash-Based Least Significant Bit (HLSB).

In [2] Kousik Das gupta have proposed algorithm Hash-Based Least Significant Bit (HLSB). In this technique they will hide the text message in video file using different way. In this technique they will use LSB video frames for hiding secret message. They first break the text message of eight bit in three parts three, three , two. And this different parts of text message will be embedded in video frames. One new procedure use in hash function which are used for selecting bit position where data is placed. But this technique will be apply only compress

video not on uncompress video. First they take a compress video file. Then they break video into different frames according to need how many frames they required. Then they find the position of bit using hash function where text message is placed. Now they embedded text message of eight bit which are break into three parts of three , three, two according to they get position from hash function. If they used this technique in other formats they required little bit modification. In other formats they first compresse video need to decompress and then apply this technique without any changing. Result and limitations of this technique is that it is apply on only compress video files. They can developed in future based on Steganographic mechanism for video steganography is the future scope of their technique.

2.1.4. Modified Least Significant Bit:-

In [1] Maninder Pal Singh, Harmandeep Singh have proposed Most Significant Bit(MSB). MSB, also called the high-order bit. The MSB is sometimes referred to the left-most bit due to the assembly in writing more important digits further to the left. The MSB can also equate to the sign bit of a binary number in one's or two's complement notation, "1" meaning negative and "0" meaning positive. In their technique the problem definition is they increase hiding capacity as compare to LSB. Firstly a video file is read and Video is in any format like avi, mp4. The video consists of audio as well as images. On both parameter work can be done so according to requirement video information is extracted. In this block diagram frames information is collected like their Number of frames, Height, Width, Frames per second. After that frames extracted from video but for embedding of data only few frames required so some frames are selected on which data to embed. The secret message in any format like images, audio, video or text. In their paper, image is used as secret message to hide. To generate stego object they applied modified LSB technique on cover as well on message to hide the message in cover object. In their paper, stego frame is generated after hiding the color image inside it using modified LSB technique. The stego frame again combine with other frames to make again video. In their technique they find result in parameter like peak signal to noise ratio of lsb is 44.1 db and MLSB 47.80-47.85dB or Payload Capacity is 8 and MLSB is 4. They use MLSB approach to Embedded of secret image into the meaningful frame of any type of video. In their paper, taken different videos and hide data. Their technique MLSB has better hiding capacity as compared to LSB and better MSE and PSNR as compared to existing MLSB technique.

## 3. RESULTS AND DISCUSSIONS

In 2015 Maninder Pal Singh, Harmandeep Singh [1] presented an efficient high capacity and a secure technique for video steganography. In this paper they hide the image ,text message, in different frames using modified LSB technique. But the limitation and result of this technique they hide secret message hide in frames but the capacity of hiding message is not sufficient for large message. In April 2012 Kousik Dasgupta, J.K. Mandal and Paramartha Dutta[2] proposed technique is hiding secret information within a video.This technique is Hash Based List Significant Bit. In this technique a Hash function is use for selecting frames. Result of this technique is work on platform independed application's with high consistancey and portability. Prof. D P Gaikwad, Trupti Jagdale, Swati Dhanokar[3] presented the steganograph technique for hiding the variable sized secrete data into video. They used Least significant bit insertion (LSB) technique. In this technique they will compress secret message is compress according to size of video before embedding. Result of this technique is capacity is little bit increase the capacity but not sufficient. Amba Mishra, Prashant Johri[4] present technique to hide the secret data within a cover frame. They use only embedding and extracting algorithm. They will hide text in running frames for security. Here they will use GA for extra security of text message unauthroized person cannot detect this message. In April 2012 Poonam V Bodhak, Baisa L Gunjal [5] designs a software to develop a steganography application to hide information or text message in video. In this technique they will be first hide text message in video file but carrying of video quality because video quality also maintained. This technique is use for increase the security of text message so unauthorized person cannot detect easily. In January 2013 Pritish Bhautmage , Prof. Amutha Jeyakumar , Ashish Dahatonde [6] parposed a new technique for information hiding for high quality of videos. In this they will use two different algorithm DCT(discrete cosine Transform) and LSB for hiding text message. In this technique text message select for hiding according to index value of text message. In this technique through they will extract text message easily as compaire to other. In August 2015 S. Deepa, R. Umarani [7] proposed algorithm Bit Exchange Method. This technique video break in two parts and then they hide text message bit by bit like matrix. Result of this technique is if any bit is loss all message is also loss. Hilal Almara'beh[8] this paper is based on all technique use in video stegnography for hiding information with high security. But in all techniques one or more difficulty reamin same like security ,capacity ,quality etc. Saurabh Singh, Gaurav Agarwal [9] parposed a method LSB Replacement. In this technique they will hide data in any other data. They also keep in mind data cannot loss is originality. And then text message hide in video frames or image so unauthorized person cannot be esaily identify which frames in text message is hidden because frames are running very fast. Spyridon K. Kapotas, Eleni E. Varsaki and Athanassios N. Skodras [10] parposed a new technique H.264 Encoded technique. In this technique they will hide high capacity data or text message in frames or video files. In this they will use two different parts of H.264. This technique also called blind information hiding technique. This technique is used in content-based data verifying and also hidden communication. Sherly A P and Amritha P P [11] they

parposed a different technique Tri way pixel value(TPVD). This technique is use in compress video file or moving frames. This technique is provide security of undetectable frames. In this no need of video decompression video. the results of proposed technique is high inconsiderable with high capacity.

## 4. CONCLUSION

There has been significant amount of research on image steganography over the years. An Efficient Modified LSB technique has better hiding capacity in compressed video as compared to LSB but not sufficient. A Prototype for Secure Information using Embedding Algorithm and Extracting Algorithm which decrease the discolor pixels in every frame,to increase the embedded Capacity in compressed video stegnography. A Vector Embedding method is proposed which direct apply on compressed video. Information security Using Spread Spectrum method to but limitation is low data security as compare to LSB method. Existing research efforts in video steganography have been limited. The question is how to accelerate the research and development of a Video Steganographic scheme for Covert Communication and Information Hiding. A new video steganography algorithm is required. vector embedding approach seems to be more promising to hide the data in motion vector components. It is presume that in the future more efficient and new advanced techniques will invented that will be efficient transmision of secret data or text message through the Internet.

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