

Advanced Steganography for Hiding Data and Image using Audio-Video

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Abstract— Steganography is a craft of concealing the discharge message that is being send in the other non mystery content. The advantage of steganography is that the normal puzzle message does not pull in mindfulness viewing itself as an object of examination. Our point is to hide secret information and picture behind the sound and highlight record separately with. Sound records are by and large compacted for limit or speedier transmission. Sound records can be sent in short stay lone parts.

Keywords — *Steganography, Cryptography, Encryption Algorithm*

1. INTRODUCTION

Security has transformed into a basic issue as information development. The encryption field serves to give security on pictures and data, for instance, mystery, substance approval and data starting affirmation. Steganography focuses on disguising information in a way that the message is indistinct for untouchables and just appears to the sender and proposed recipient. It is useful instrument that allows stealthy transmission of information over an over correspondences channel. The advantage of steganography over cryptography alone is that the normal riddle message does not pull in mindfulness viewing itself as an object of examination. Sound component crypto steganography which is the blend of picture steganography and sound steganography using PC legitimate sciences framework as a device for check.

The accompanying Figure 1. Show four sorts of steganography philosophy:

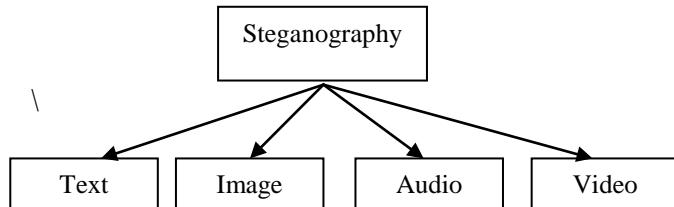


Figure 1:-Types of Steganography

Our point is to disguise puzzle information and picture behind the sound and highlight report exclusively. Sound records are by and large compacted for limit or speedier transmission. Sound records can be sent in short stay single bits. There are distinctive sorts and strategy of data stowing ceaselessly in sound such as Least Significant Bit Encoding and Phase coding. In LSB coding is the minimum troublesome way to deal with insert information in an electronic sound record. By substituting the smallest basic piece of each examining point with a twofold message, LSB coding mulls over a considerable measure of data to be encoded. In Phase coding addresses the bustle's impairments inciting frameworks for sound steganography.

1.1 Stegnography

Steganography concentrate on concealing data in a manner that the message is imperceptible for pariahs and just appears to the sender and planned beneficiary. It is valuable device that permits incognito transmission of data again and again interchanges channel. Steganography is a method which is utilized to conceal the message and keep the discovery of shrouded message. Different advanced strategies of steganography are

a) Video Steganography c) Audio Steganography

Sound Video stegnography is a present day method for concealing data in a way that the undesirable individuals may not get to the data. The propose strategy is to shroud mystery data and picture behind the sound and video document separately.

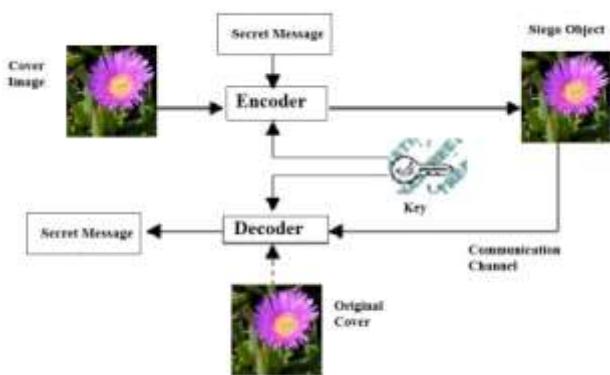


Fig 2:- Stenography Mechanisms

1.2 Audio Stegnography

Sound steganography programming can install messages in WAV, AU, and even MP3 sound documents. In sound steganography sound record is altered in an a way they contain a shrouded data. This adjustment done in a manner that emit information must be secure and without destroying the first flag.

The fundamental model of Audio steganography comprises of Carrier (Audio document), Message and Password. Bearer is otherwise called a spread document, which hides the mystery data. Encoding mystery messages in sound is the most difficult strategy on the grounds that the human sound-related

framework (HAS) has such a dynamic reach, to the point that it can listen over. Sound records are typically compacted for capacity or speedier transmission. Sound documents can be sent in short remain solitary portions. There are different sorts and system of information covering up in sound such as Least Significant Bit Encoding and Phase coding. Embedding mystery messages in sound document is more troublesome than inserting messages in advanced picture. With a specific end goal to shroud mystery messages, different techniques for installing data in computerized sound like Least critical piece, equality bit coding, stage coding, spread range and so forth.

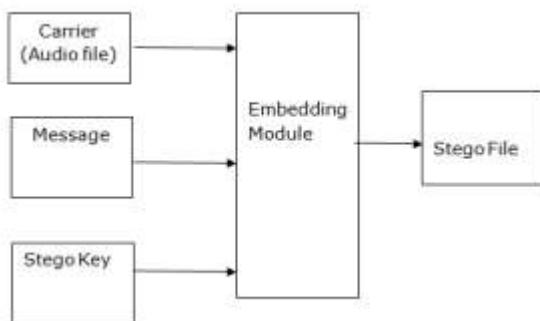


Figure 3:- Basic Audio Steganographic Model

1.3 Video Stegnography

Video is an electronic medium for the recording, replicating and television of moving visual images. Video Steganography is a system to conceal any sort of documents into a conveying Video file. The utilization of the video based Steganography can be more qualified than other interactive media records, as a result of its size and memory prerequisites. Recordings are the arrangement of images. The number of still pictures per unit of time of video extents from six to eight edges for every second. In video steganography information takes cover behind the video utilizing distinctive strategies. Fundamentally there are three inserting systems for pictures practically speaking, to be specific Least Significant Bit (LSB), Transform based and Masking and sifting. The best method is that to shroud mystery message without influencing the nature of video, structure and substance of video. In the wake of concealing a mystery information in video make "stego" video document which is send to the beneficiary.

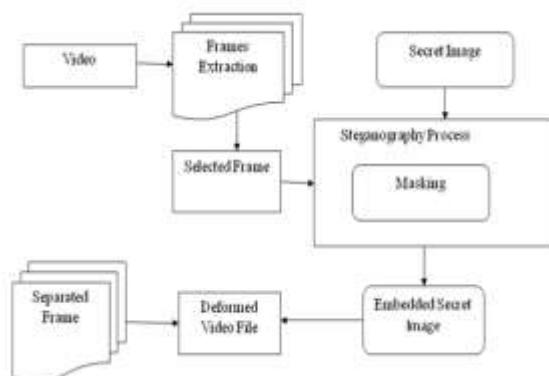


Figure 4:-Hiding Image Behind Video File

2. RELATED WORK

In PC vision, steganography is an immense territory of study and research that have been done all through. There are numerous Techniques of video steganography, for example, Least Significant Bit strategy (LSB), Spread Spectrum, and Discrete Cosine Transform (DCT). Minimum Significant Bit technique (LSB) is a standout amongst the most widely recognized and fruitful strategy which shroud the mystery information at all critical piece of the spread video. Alongside this numerous Author's had likewise utilized distinctive strategies and Encryption Algorithms to give more mystery to the message.

Might 2014, Manpreet Kaur, Er. Amandeep Kaur [1] utilized Hash-LSB technique which is an effective steganographic strategy for inserting the mystery message into spread video. Here the writer has connected cryptographic technique i.e RSA calculation to secure a mystery message.

April 2014, Deepak Kumar Sharma, Astha Gautam, [2] A twofold hash limit methodology is used to pick the pixel from line and section. A quadratic testing framework is used for handling the issue of effect where we are incorporating a prime number with the present hash regard instead of direct chase. A division technique framework is used to point out the pixel in an edge that is pixel's range in line and area in a packaging. Right when pixel is found, the character of information that is to cover, a twofold estimation of that lone character is supplanted by one of a kind pixel's red part, then second packaging is to pick and second character's parallel worth is supplanted by the main pixel's green section, this will continue until the each combined character of the information are concealed.

December 2010, Kriti Saroha, Pradeep Kumar Singh, [3] Shows another steganographic method for introducing a photo in an Audio record. Emphasis will be on the proposed arrangement of picture concealing in sound and its relationship with clear Least Significant Bit (LSB) insertion methodology for data stowing ceaselessly in sound.

Might 2009, Cheng-Hung Chuang and Guo-Shiang Lin, [4] an optical cryptosystem with adaptable Steganography is proposed for highlight game plan encryption and translating. The optical cryptosystem uses a twofold subjective stage May 2009, Cheng-Hung Chuang and Guo-Shiang Lin, [4] an optical cryptosystem with adaptable Steganography is proposed for highlight course of action encryption and interpreting. The optical cryptosystem uses a twofold self-assertive stage encoding figuring to scramble and unscramble highlight game plans. The component sign is at first traded to RGB model and after that secluded into three channels: red, green, and blue. Each channel is encoded by two sporadic stage shroud made from session keys. For higher security, an upside down system is associated with figure session keys. The figured keys are then introduced into the mixed element diagram by a substance subordinate and low mutilation data embeddings framework. The key movement is refined by disguising considered data along

with the mixed component plot with a specific hiding plan made by the zero-LSB sorting framework.

2007, Malik, H.M.A, Ansari, R., KhokharA, [5] introduced novel strategy for data concealing in cutting edge sound that undertakings the low affectability of the human sound-related system to stage bending. Garbled however controlled stage changes are displayed in the host sound using a course of action of allpass channels (APFs) with specific parameters of allpass channels, i.e., shaft zero ranges. The APF parameters are chosen to encode the embeddings information. In the midst of the area organize, the power scope of the sound data is assessed in the z-plane a long way from the unit circle. The power reach is used to assess APF shaft ranges, for information deciphering.

3. PROBLEM DEFINITION

In existing framework, there are a few disadvantages which influence the nature of sound video record furthermore diminish the security level. The collector need the precise of verification picture which the beneficiary matches with the confirmation picture in the video outlines for getting to stego-sound record and recipient likewise sends the casing number to the sender where the information is to be covered up. This expansions multifaceted nature and declines the security level. The primary drawbacks connected with the utilization of existing strategies such as reverberation concealing, spread range and equality coding are; human ear is exceptionally delicate to commotion and it can frequently recognize even the scarce piece of clamor brought into a sound record and another issue is strength.

SCOPE

The scope of the project is to limit unauthorized access and provide better security during message transmission. To meet the requirements, we use the simple and basic approach of steganography and cryptography. In this project, the proposed approach finds the suitable algorithm for embedding the data in the digital audio signals and video frames using steganography which provides the better security pattern for sending the messages through network.

4. PROPOSED METHODOLOGY

We are consolidating cryptography and steganography for concealing information behind sound and picture behind video in sound video record. For concealing picture behind video we utilized LSB trade procedure and for concealing information behind the sound utilized Parity coding calculation. The Blowfish calculation is utilized for more security reason.

Sender chooses any one sound video record. After that sound video record separate utilizing as a part of manufacture programming. Presently sender will choose a mystery picture which will be transmitted to the recipient. In next step select the video document. Video is only an accumulation of various edges. The quantity of still pictures per unit of time of video reaches from six to eight edges for every second. The

calculation of video stegnography depends on the way that every pixel spoke to by 3 bytes where every byte speaking to the force of 3 essential hues that is RGB Red, Green and Blue) Size of picture document is specifically identified with number of pixels and granularity of shading definition. Sender chooses the more than one casing and utilizing LSB calculation implanted the mystery picture into the casing. The piece of LSB of mystery picture installed in one edge and MSB in another casing. The choice of casings is rely on upon the client or sender. He can be selecting every time new frames. The framework requested passkey for the client. The client entered the passkey to the framework in a number. This passkey number inside chooses the edge number.

Assume chose outline no 15 of video then next chose edge is 16 naturally

Presently the piece of LSB of mystery picture cover up in first casing and MSB some portion of picture stow away in next casing.

For concealing mystery message behind sound select the sound record.

Sender will choose a for the transmission which we will be installed in video by the framework in the video outline signs of the sound video document and the encryption key will be holed up behind the video outline.

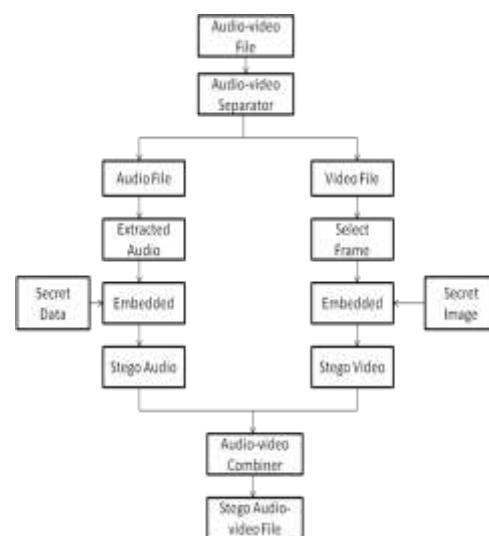


Fig 5:- Working at Sender Side

5.1 LSB Coding

An extremely mainstream strategy is the LSB (minimum huge piece), which replaces the slightest critical piece in a few bytes of the spread document to conceal a grouping of bytes containing the shrouded information. That is normally a viable procedure in situations where the LSB substitution doesn't bring about critical quality corruption, for example, in 24-bit bitmaps. In figuring, LSB is the bit position in a parallel whole number giving the units esteem, i.e., figuring out if the number is even or odd. The LSB is some of the time alluded to as the privilege most piece, because of the tradition in positional

documentation of composing less critical digit further to one side. It is practically equivalent to the minimum huge digit of a decimal whole number, which is the digit in the ones (right-most) position..

1	0	0	1	0	1	0	1
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Fig 2: Binary representation of Decimal 149

The parallel representation of decimal 149, with the LSB highlighted. The MSB in a 8-bit twofold number speaks to an estimation of 128 decimal.

A calculation of vide steganography depends on the face that every pixel is spoken to by 3 bytes where every byte reproducing the power of 3 essential hues that is RGB(Red, Green, and blue) . Size of pictures record is specifically identified with number of pixel and granularity of shading definition.

Lets information to be shrouded =ABC

ASCII code of A= 65 and relating twofold is 01000001.

ASCII code of B= 66 and relating twofold is 01000010

ASCII code of C= 67 and relating twofold is 01000011

Let the main pixel's RGB segment

Red	Green	Blue
10110001	01001100	10001001101

Red component is replaced with binary of 65i.e. A

Replaced Red components

Red	Green	Blue
01000001	01001100	10001001101

Green component of second pixel is replaced with binary of 66 i.e. B.

Replaced Green components

Red	Green	Blue
10110001	01000001	10001001101

Red	Green	Blue
10110001	01000001	01000001101

Blue component of third pixel is replaced with binary of 67i.e. C

Replaced Blue components

Red	Green	Blue
10110001	01000001	10001001101

And the process is continues.

In proposed method hiding a secret image behind the video using LSB algorithm. Video is nothing but a collection of frames. Here we used LSB algorithm for hiding secrete message using 2 frames. For the less distortion of cover media and accurate recovery of data at reciver side.

Consider pixel of the cover media is 254

Binary representation is 11111110

This binary code can be encrypting by using some masking. We can use any sequence of binary number.

Consider the binary number which is used for mask is 11110000

Perform the ANDing operation of the binary representation of the first pixel of the cover image and binary number used for mask.

$$\begin{array}{r}
 X1 = 11111110 \\
 \oplus \\
 \text{Mask} = 11110000 \\
 \hline
 A = 11110000
 \end{array}$$

Now select the first pixel of secrete image. The image which we want to hide. Suppose the first pixel of the secrete image is Y=127

Binary representation of Y is = 01111111

Again perform the ANDing operation of the first pixel of the secrete image and binary number of mask.

$$\begin{array}{r}
 \rightarrow Y = 01111111 \\
 \rightarrow \text{Mask} = 11110000 \\
 \hline
 \rightarrow B = 01110000
 \end{array}$$

Now performing LSB substitution on process. In LSB substitution the 4 bit of the of the every secrete image in the four bit of every bit of the cover file.

$$\begin{array}{r}
 \rightarrow A = 11110000 \\
 \rightarrow B = 01110000
 \end{array}$$

After Applying LSB algorithm the modified A is =11110111. This representation is converted into digital the value of A=247.

The original values of pixel of the cover media is 254 and after embedding the secret image the value of pixel is 247. If we do the calculation $254-247=7$

That means there is only lost of 7 bit. This lost do not effect on cover media. So there is no distortions detect.

5.2 Parity coding

Equality coding is one of the vigorous sound steganographic methods. Rather than breaking a sign into individual examples, this technique breaks a sign into discrete specimens and inserts every piece of the mystery message from an equality bit. In the event that the equality bit of a chose district does not coordinate the mystery bit to be encoded, the procedure transforms the LSB of one of the specimens in the locale. In this way, the sender has to a greater extent a decision in encoding the mystery bit. In the event that the equality bit of a chose locale does not coordinate the mystery bit to be encoded, the procedure flips the LSB of one of the examples in the district.

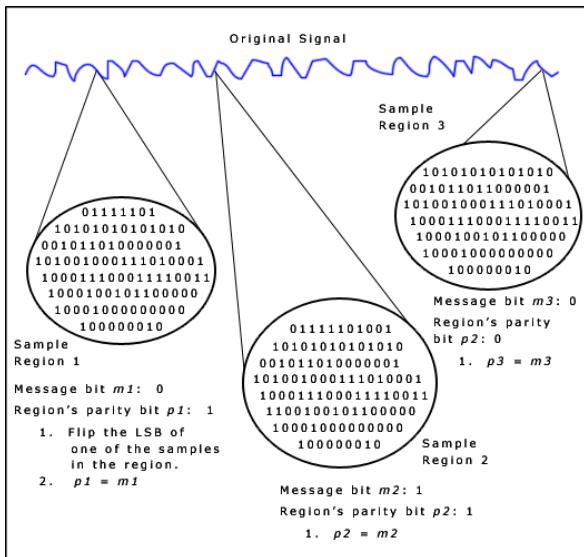


Fig 5:- Parity Coding Procedure.

5. CONCLUSION

In this paper, diverse systems are talked about for installing information in content picture, sound/feature signs and IP datagram as spread media. All the proposed techniques have a few confinements. The stego sight and sound delivered by specified routines for mixed media steganography are pretty much defenseless against assault like media organizing, pressure and so forth. The exploration to gadget solid steganographic procedure is a ceaseless process. We are going to propose a framework that will give better stego documents utilizing sound video approach. Information security using data hiding Audio-Video with the help of computer forensic technique providing better hiding capacity and security. This method is very safe and secured. Data recover at the receiver side is error free.

REFERENCES

- [1] Manjinder Kaur1, Navjot Kaur2, Harkamaldeep Singh, "Adaptive K-Means Clustering Techniques For Data Clustering" International Journal of Innovative Research in Science, Engineering and Technology, ISSN: 2319-8753, Vol. 3, Issue 9, September 2014
- [2] Shiv Ram Dubey, Pushkar Dixit, Nishant Singh, Jay Prakash Gupta4 1glau, Mathura, India "Infected Fruit Part Detection Using K-Means Clustering Segmentation Technique", International Journal Of Artificial Intelligence And Interactive Multimedia, Vol. 2, Nº 2. Doi: 0.9781 / Ijimai. 2013
- [3] D Surya Prabha and J Satheesh Kumar, "A Study on Image Processing Methods for Fruit Classification" roc. Int. Conf. on Computational Intelligence and Information Technology, CIIT, 2012
- [4] Prabhisek Singh, Ramneet Singh Chadha Computer Sc. & Engg., CDAC Noida India. "A Novel Approach to Image Segmentation", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 3, Issue 4, April 2013
- [5] Guo Feng; Cao Qixin and Nagata Masateru, "Fruit Detachment and Classification Method for Strawberry Harvesting Robot", International Journal of Advanced Robotic Systems, Vol. 5, No. 1, ISSN 1729-8806, pp. 41-48, 2008
- [6] J.Ramprabhu1, S.Nandhini2, "Embedded System Based Fruit Quality Management Using PIC Micro Controller" International Journal for Research in Applied Science & Engineering Technology (IJRASET), Volume 3 Issue I, ISSN: 2321-9653, January 2015
- [7] Singh Dhillon, Er. Ashok Kumar Bathla, "Detecting Guava Quality Using Gradient Function Histogram Plotting" International Journal of Engineering and Technical Research (IJETR) ISSN: 2321-0869, Volume-2, Issue-9, September 2014
- [8] Kyosuke Yamamoto 1, Wei Guo 1, Yosuke Yoshioka 2 and Seishi Ninomiya, "On Plant Detection of Intact Tomato Fruits Using Image Analysis and Machine Learning Methods" Sensors 2014, 14, 12191-12206; doi:10.3390/140712191, July 2014
- [9] Sanjay Chaudhary*, Bhavesh Prajapati, "Quality Analysis and Classification of Bananas" International Journal of Advanced Research in Computer Science and Software Engineering, Volume 4, Issue 1, ISSN: 2277 128X, January 2014
- [10] Ghabousian, A., & Shamsi, M., "Segmentation of apple color images utilizing fuzzy clustering algorithms," Advances in Digital Multimedia, vol. 1(1), pp. 59-63, 2012
- [11] D. I. Amarasinghe and D. U. J. Sonnadara, "Surface color variation of Papaya fruits with maturity", Proceedings of the Technical Sessions, 25 , 21-28, Institute of Physics – Sri Lanka, 2009
- [12] Slamet Riyadi, Ashrani A. Abd. Rahni, Mohd. Marzuki Mustafa, and Aini Hussain, "Shape Characteristics Analysis for Papaya Size Classification" The 5th Student Conference on Research and Development –SCoReD, Malaysia, 1-4244-1470-9/07 IEEE. 11-12 December 2007
- [13] Leemans, V., magein, H. & Destain, M.F. On-line fruit grading according to their external quality using machine vision. Biosystem Engineering 83(4): 397 – 404, 2002.
- [14] Hamirul'Aini Hambali, Hazaruddinharun, University Utara Malaysia ,Sharifah Lailee Syed Abdullah, Nursuriati Jamil, University technology Mara, "A Rule-Based Segmentation Method For Fruit Images Under Natural Illumination", Ieee ,978-1-4799-4575-7/14/ 2014
- [15] Abhishek Silwal, Aleana Gongal, Manoj Karkee., "Identification of red apples in field environment with over the row machine vision system", Agric Eng Int: CIGR Journal Vol. 16, No. 4, December, 2014

- [16] Tomas U. Ganiron Jr. International Association of Engineers (IAENG)," Size Properties of Mangoes using Image Analysis" International Journal of Bio-Science and Bio-Technology Vol.6, No.2 (2014), pp.31-42 , 2014.
- [17] Sharifah Lailee Syed Abdullah¹, Hamirul'aini Hambali², And Nursuriati Jamil³ Sarawak, Malaysia. Universiti Utara Malaysia "Adaptive K-Means Method For Segmenting Images Under Natural Environment" Proceedings Of The 4th International Conference On Computing And Informatics, Icoci 2013, 28-30 August, 2013.
- [18] Yutan Wang, Jiangming Kan, Wenbin Li And Chuandong Zhan, "Image Segmentation And Maturity Recognition Algorithm Based On Color Features Of Lingwu Long Jujube", Advance Journal Of Food Science And Technology 5(12): 1625-1631, Issn: 2042-4868; E-Issn: 2042-4876, 2013.
- [19] Payne, A. B., Walsh, K. B., Subedi, P. P., & Jarvis, D., "Estimation Of Mango Crop Yield Using Image Analysis - Segmentation Method," Computers And Electronics In Agriculture, Vol, 91, Pp. 57-64, 2013.
- [20] Sharifah Lailee Syed Abdullah^a, Hamirul'aini Hambalia^{B*}, Nursuriati "Segmentation Of Natural Images Using An Improved Thresholding-Based Technique" Jamilc International Symposium On Robotics And Intelligent Sensors 2012 (Iris 2012)