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Image-Text Fusion Algorithm for Secure Message Transmission

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ABSTRACT:In this model we proposed Image-text fusion algorithm. Image compression is reduce the number of bitsrequired to represent an image without degrading the quality of the image to an unacceptable level. Thereduction in file size allows more images to be stored in a given amount of disk or memory space andreduces the time required for images to be sent via the internet. Storage capacity and the speed oftransmission are the two important factors that arise during the heavy duty of multimedia over theinternet. The best image quality at a given bit-rate (or compression rate)is the main goal of imagecompression. We implement lossless technique so our peak signal to the noise ratio and mean squareerror will go better than the old algorithms and due to DWT and IDWT we willget good level ofcompression.Henceoverallresultof Image-Textfusionalgorithmisgood.

KEYWORDS: DWT(Discrete Wavelet Transform)

I. INTRODUCTION

Thedemandfor secure communication over the link has augmented the needfor robust algorithms. In order to ensure confidentiality, authenticity and integrity of themessages transmitted, the algorithms must facilitate high efficacy. Now a days majordemand is whatever the data is transfer over the link with the help of IOT(internet ofthings).So the Data security, Data compression and data enhancement are the importantthings while the transmission. For this purpose we are designing the algorithm who givesus higher efficiency, good security and the respective algorithm will help us for datahiding as well. To fulfil these requirements we are using the algorithm named DiscreteWaveletTransform(DWT).WiththehelpofsomelittlebitmodificationsinDCTalgorithm so that we can compile our data and encodes with each other and forwardahead.

In this paper,wehave implemented amethodforsharing secret messagesencryptingthemingrey-scaleimages,thatareprocessedwithDiscreteWaveletTransform (DWT). The algorithm incorporates a novel sub-bandelimination techniqueto exploit the basic properties of DWT and embed a text message in the eliminated sub-band.Theprocessofbandeliminationisgovernedbydetermining theenergycontribution of each band. Theproposed technique ensures that the textmessage isreceived only by an authenticated receiver possessing the access key. This technique isfound to provide a reliable exchange of information, as well as acceptable compressionratios. This paper further illustrates a detailed analysis of the algorithm.Theinternetisusedextensivelyasdigitalcommunicationmediumnowadays,formostoftheapplications.With extensiveuseofthe internet,security is being aprimeissuetomaintain the confidentiality of the data with fast speed. An authentication provides theprotection from the unauthorized access. Now a days millions of images and videos arecirculatedviatheInternetalloverthe world.Storagecapacityandthespeedoftransmissionarethetwoimportantfactorsthatarisesduringtheheavydutyofmultimedia over Internet. The best image quality at a given bit-rate (or compression rate)is the main goal of image compression. A huge amount of internet information is usedeither graphical or pictorial in nature. The requirements for storage and communicationsare high. Compressing the data is one of the way out for this problem. In this work weproposedaapproachtointegratemanymethodtointroduceanefficientimagecompressiontechnique thatmaybegoodmethodcomparedwiththeexistedmethods. Image security is most important aspect in any

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transmission. For security purpose we are sending the chaotic image after using DWT. Whatever the input image given to the DWT is converted into four sub-components that are horizontal component, vertical component and two diagonal components.

MOTIVATION

Existing system ofinformation security that is Cryptography does not guard againstthe vulnerabilities and threats that emerge from the poor design of systems, protocols,and procedures. These need to be fixed through proper design and setting up of adefensiveinfrastructure.

Steganography technique is gone in the wrong hands like hackers, terrorist, criminalsthen this can be very much dangerous for all. Huge number of data, huge file size, sosomeonecansuspectaboutit.

Watermarking doesn'tpreventimagecopyingbutwecantrackdownand detectownership of copiedimages.WatermarksResizing, compressing images from onefile type to another may diminish the vanishes if someone manipulates the imagewatermarkanditbecomesunreadable.

II. LITERATURE SURVEY

Now a days millions of images and videos are circulated via the Internetall over the world. Storage capacity and the speed of transmission are the twoimportant factors that arise during the heavy duty of multimedia over Internet.The best image quality at a given bit-rate (or compression rate) is the main goalof image compression. A huge amount of internet information is usedeithergraphicalorpictorialinnature.Therequirements forstorageandcommunications are high. Compressing the data is one of the way out for thisproblem.[1]

Inthisworkweproposedaapproachtointegratemanymethodtointroduce an efficient image compression technique that may be a good methodcomparedwiththeexistedmethods(MohamedA.El-Sharkawy,1997IEEE).Image compression is important in the transmission and storage of imageinformation.[2]

Discrete Wavelet Transform (DWT) based coding, is another efficienttechnique used for image compression and Security. The ability to display image at differentresolutions like low frequencies and high frequencies simultaneously makes it abetter method compared to others. Utilizing the benefits of both DCT and DWTpopular coding techniques a new technique known as hybrid transform techniquehasbeenintroducedwherethese twocodingschemesareimplementedtogether(M.MohamedSathik, K.SenthamaraiKannan and Y.JacobVetha Raj,SIPIJVol.2,No.1,March2011)

Data hiding in encrypted images has the advantage of good privacy andsecurity.[3]

This technique will be used for hiding a secret image inside a coverimage using secret keys. In this paper, the Discrete Wavelet Transform method isused.(DWT)isanywavelettransformwhich isdiscretelysampledwhichcapturesbothfrequencyandlocationinformation.TheDiscreteWaveletTransformgivestheexcellentpeaksignaltonoiseratio(PSNR)andlesscomputationtime.The mainadvantageofusingDWTtransformisthatthewholeimagewouldbeprocessedasasingleunit.Itshowshighrobustness.[4]

The embedded secret image can be extracted with high visual quality.The patch can be used instead of pixels which result in large hiding room. Thussparse coding is used, which is an approximation solution; the leading residualerrorsareencodedandself-embeddedwithinthecoverimage.[5]

Nolossofdataisobservedbecausethelearneddictionaryisalsoembeddedintotheencryptedimage andalargevacatedroomcan beachievedandthus the data hider can embed more secret messages in the encrypted image. ThePSNRofthemethodhasbeenincreased by9.18percentapproximately.[6]

Thisworkproposesanovelschemetoreversiblyhide data intoencryptedgray scale image in a separable manner. During the first phase, thecontent owner encrypts the image by permuting the pixels using the encryptionkey. The data hider then hides some data into the encrypted image by histogrammodification based data hiding, making use of data hiding key. At the receiverside, if the receiver has only encryption key, he can generate an image similar tothe original one, but cannot read the hidden data. Peak Signal to Noise Ratio(PSNR) of this decrypted image is much higher than the existing methods. If thereceiver has only data hiding key, he can extract the data, but cannot read thecontent of the image. If the receiver has both keys, he may first extract the data[7]

using data hiding key and then decrypt the image using encryption key. Themethod also has a higher data hiding capacity than the existing reversible datahidingtechniquesin encryptedimage.[8]

Data hiding for digital images is important because it can protect data andcommunicationagainstmaliciousattacks,suchas

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informationstealingandcopyright piracy. A VQ based data hiding method reads a cover image C and asecretdata stringSastheinput,andcreatesastegoimageoracodes treamas theoutput O. VQ based data hiding methods usually provide reversible data hiding,referring to that the output O can be used to reconstruct the original cover imageC and the secret data string S. This paper presented existing data hiding methodsfor VQ based images, including VQ, SMVQ, and SOC images. These methodswereclassified intofournonoverlappinggroupsaccordingtoreversibili tyandtheiroutputformats.[9]

Reversible methods that produce steno-images as out-puts: A method inthis group has the most restrictions than other groups. This paper indicated thattheexistingmethodshavesmall capacityforthesecretdatathanothermethods.[8][9]

This paper showed that nonstandard encoding methods (e.g., JNC) areused to increasethe capacity for the secret data. They are becoming dominant inthisgroup.[10]

III. PROBLEM STATEMENT

Majordemandforsecurecommunicationov erthelink.mostoftheapplications of Wavelet Transform is about image processing such as imagecompression, edge detection, noise removal, etc. images can be decomposedinto four parts by two-dimensional Wavelet Transform. By setting some partsofitssub-images,wecanreducethequantityofinformation,ino therwordswecancompresstheimageby settingtheuselessdata.

In order to ensure confidentiality, authenticity, and integrity of messagestransmitted; the algorithms must facilitate higher efficiency. The security forthe digital images has become highly important since the communication bytransmitting of digital products over the open network occur very frequently.The main goal of security management is to provide authentication of users,integrity,accuracyandsafety ofdataresources.

IV. HARDWARE AND SOFTWARE REQUIREMENT

MinimumSystemRequirements:
UserInterfacewillbecreatedinMATLAB.
Windows: WewillbeusingWindowsXP/Windows7 /Windows8/Windows10asOperatingSystem.
HardwareRequirement:
HardDisk:500GBandabove
Ram:4GBand above
ProcessorPentiumandabove
SoftwareRequirement:
MATLABR2009b

V. METHODOLOGY

Transmitter:-
IntransmitterSectiontheinputimageisgiventotheTw oleveldecomposition.
TwoLevelDWT:-
In two level DWT we separate out components that are LL,HH,HL,LH respectively. Afterthat we are separate out the LL image into Four components again and for remainingdiagonalcomponentswareusingIDWTi. e.InverseDWT.
Inversewavelettransform:-

By using IDWT to the components and then IDWT will convert them into the chaoticimage means it is the random image or we can say fused image in this image the pictureis not visible either it will looks like complete black color image or in the form of dottedimage this is also known as Fused Image. If in case of data hacking this image will not bedecode by the unauthorizeduser because from the fused image no one can make little bitjudgmentofwhatactualdata ispresentinimage.Because forthistheunauthorizedpersonmust need trial and error. And for Trial and Error needs 10-12Lakh Permutation computewithout this the unauthorized user will never conclude that what actually stored in thisfusedimage.Althoughtheyare notabletoretrievetheinformation.Thenthisfusedima gewillsend tothereceiversection.
Receiver
Image-TextfusionImage:-In Receiver section we are again using inverse DWT for Text-fused image.Thatmeansewe are using Double inversion.Firstlywe are taking the inverse DWTof the originalinputin transmitter section and now we are again taking the Inverse DWT of Inverse DWT inReceiver section. After taking Inverse DWT of Inverse DWT we can get the originalimage.
TwoLevelDWT:-
The original image is getting after IDWT and we will going to extract again in FourComponent. Once extraction is done then we are adding the hidden massage signal sothatwearegettingrecoveredImage.Sothisisoveral lsimplelayoutoftheproject.

VI. CONCLUSION

The algorithm suggested for concealing the secret message will be known as“WaveletBasedImage-

TextFusionAlgorithm".
It will exhibit the feature of being adaptive and highly flexible offering arobustperformance.
The unique approach of taking a host image as a carrier data, processing itwith wavelet transform and then replacing certain coefficients with the ASCIIvaluepertainingtothesecretmessagewillfacilitatevisualencryption.
Data confidentiality is important criteria for any modern communication. Thedata hiding approach is obtained with the help of wavelet transform Wavelettransformprovidesdecomposition(average subband)oftheoriginal

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