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Advanced Encryption Then Compression System For Grayscale Images And Color Images

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Abstract - Image encryption and compression algorithms such that compressing encrypted images can still be efficiently performed . The Proposed System encryption used as AES algorithm .and compression of the encrypted image using Huffman algorithm and Hybrid ETC algorithm. PSNR value is calculated for input image and decompressed image and results are plotted on graph. PSNR results indicate that ETC algorithm gives better PSNR value i.e. better image quality. The conventional methods for measuring quality of image are MSE & PSNR.

Key Words: **PSNR, AES, ETC, Encryption, MSE.**

1.INTRODUCTION

Encryption then compression system is that compression has to be conducted in the encrypted image. In an ETC system, Alice encrypts the image and sends it to Charlie as depicted in. Charlie does the compression and forwards the compressed image to Bob decompresses and decrypts it to get back a reconstructed image.

2. LITERATURE SURVEY

S.Dharanidharan , S.B.Manoojkumaar , Proposed that Encryption Algorithm to encrypt the full image in an efficient secure manner, after encryption the original file will be segmented and converted to another image files. By using Huffman Algorithm the segmented image using compression.[5].

Kalyani G. Nimbokar, Milind V.Sarode, Proposed that image encryption scheme operated in the prediction error domain is ab.le to provide a reasonably high level of security**.** Encryption-then-Compression (ETC) system. Within framework, the image encryption has been achieved via random permutation. The analysis regarding the security of the proposed permutation-based image encryption method and the efficiency of compressing the encrypted[7].

3. PROBLEM IDENTIFIED

In existing Encryption Then Compression system for Encryption Prediction Error Clustering and Random Permutation algorithm is used, and for compression Adaptive coding algorithm is used. Both mentioned algorithms are uses only Gray Scale image as Input i.e. Color image cannot be used as Input while using these algorithms.

4. Proposed System

In proposed image Encryption then compression system for encryption AES algorithm is used and for compression Huffman Algorithm and Hybrid ETC algorithm is used. By using both these algorithms it is possible to use Gray scale as well as color images as input.. For Hybrid ETC algorithm it is showing better compression results than Adaptive coding as well as better PSNR values (Better image quality) than traditional Prediction error clustering and random permutation algorithm

4.1 AES algorithm Used as Encryption

AES has a fixed block size of 128 bits and the key size of 128,192,or 256 bit. The block and Keysize in any multiple of 32 bits, with a minimum of 128 bits. The Blocksize has a maximum of 256 bit. AES operates on 4*4 matrix of bytes. AES chipper is number of repetitions of transformation round that convert the input plaintext into final output of chipertext.

4.1.1 Encrypted image of compression using Huffman algorithm

An algorithm which is used to compress lossless data is called Huffman coding. Huffman coding use of a variable-length code table for encoding a source symbol. The use of that it builds an extended binary tree with a minimum weighted path length from a set of given weights.

4.2 Hybrid ETC compression algorithm:-

Hybrid ETC compression is the better compression result for Adaptive coding algorithm and Huffman algorithm and PSNR results also better for ETC algorithm The proposed Pixel Size Reduction loss-less image-compression algorithm works by simply representing pixel in least number of binary bits from each symbol.

5. RESULT AND ANALYSIS

1) **PSNR Value :-**PSNR is most commonly used to measure the quality of for image compression. The signal in this case is the original data, and the noise is the error introduced by compression.
PSNR= (10*log10(r*r/MSE)

R=7 Image Index	ETC	Huffman	AC
Lena	69.64	66.21	66.61
Peppers	68.59	66.31	66.73
Goldhill	68.97	65.31	67.12
Boat.	70.95	66.17	67.6
Man	70.83	65.85	67.06
Harbor.	70.38	65.37	67.1
Airplane.	69.44	65.91	66.75
Barbara.	68.57	65.84	66.32
Bridge.	70.49	65.95	66.83
Tank	68.82	65.97	66.81

Table:PSNR value Results of huffman ,Hybrid ETC, AC compression.

6. CONCLUSION

In proposed Encryption Then Compression System AES algorithm used as encryption and hybrid ETC algorithm uses as compression .Gray scale as well as color image as Input. With this algorithms PSNR result also calculated for hybrid ETC , Huffman and Adaptive algorithms. Hybrid ETC compression algorithm Better results then Other two algorithm.. Thus it is concluded that ETC system encryption as AES , Huffman and Hybrid ETC algorithm it is possible to use color as well as gray scale image as input and receiver will get better image quality.

7. REFERENCES

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