

**SURVEY OF IMAGE COMPRESSION AND ENCRYPTION METHOD LOSSLESS APPROACH**Lavanya.M<sup>1</sup>, Dr.Kodhai.E<sup>2</sup>, Dr.Danapaquiame.N<sup>3</sup>

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**Abstract**— image compression and encryption systems have been raised to give security to the information in the pictures, yet at the same time picture encryption is to be done before the picture pressure. This makes an issue of how to synchronize both these operations so that pressure of the Encrypted pictures is finished with greatest proficiency. In this paper we examine different systems rose for Encryption then Compression prepare and eventually outline another and proficient strategy that gives most extreme productivity as far as encryption and additionally as far as pressure.

**Keywords:** Compression, Encryption, Lossy, Lossless, Run Length, Encoding, Huffman Coding, Arithmetic Coding, LZW.

**I. INTRODUCTION**

The Prime need of Image Compression is to decrease the size the picture for capacity reason [1]. Presently a day it is regular to pack the record picture so that new changes can happen and to meet the criteria for certain confinement. This paper demonstrates about various strategy utilized for picture pressure. Pressure of paired crude information is expressively unique in relation to pressure of picture [2]. Picture Compression additionally diminish the excess, additional data, and to change information in effective way. Why the need of short information is more required? The ideal purpose behind this is it let down the

cost. Information Compression has persuading application in field like circulated framework. There are a few approaches to grouped picture pressure procedure. Among them one of imperative attributes is that how much measure of information is decreased amid pressure which can't recuperate amid decompression Technique in which just some measure of information is evacuated is called lossy information pressure. What's more, system in which we get information is same as real information is known as lossless information pressure. Lossless picture pressure are at prime significance in field of medicinal while for lossy it is valuable in video pressure. At the point when forgiven data

A1/A2 repetition of information RD for same bit of information in different lines is spoken to as takes after

$$RD = 1 - (1/LR) \quad (1)$$

Where R is pressure proportion LR=A1/A2 [4]. There are numerous procedure for taking after pressure which are as per the following

Run length Encoding, Arithmetic coding, Huffman, Dictionary Based, Sliding window Technique, etc[3]. Among this we have utilized four systems Run Length Encoding, Huffman Coding, Arithmetic Coding, and LZW.

## II. TYPES OF COMPRESSION

In classification of Image compression method there are two types.

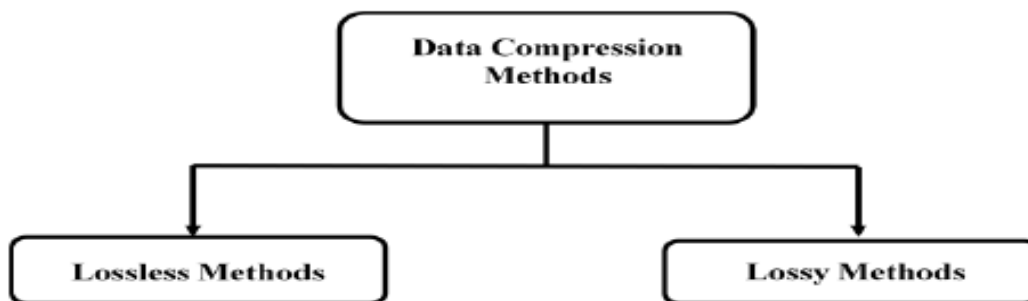


Fig. 1. Types of Data Compression Techniques

### A. Lossless Compression Technique

Lossless pressure is a pressure in which after decompression the picture stays same as the genuine picture. Lossless information pressure most likely adventures measurable repetition to express information all the more exactly with no misfortune in data [11]. As said before lossless techniques are favored for therapeutic imaging, specialized drawing, satellite picture and so forth. The accompanying is a portion of the techniques which are utilized for lossless pressure. It has numerous applications and valuable in arrangement like ZIP document and in hold of UNIX. Numerous records arrange like GIF, PNG utilizes just lossless pressure for their picture [7]. There is numerous calculations which are utilized as a part of lossless picture pressure.

### B. Lossy Compression

In lossy pressure name itself expresses that there is loss of information in some way. The decompressed picture is not same as real picture [5]. Lossy pressure has player pressure proportion over lossless methods with some loss of information. It is not reversible. Keeping in mind the end goal to check the picture quality, it checks the Pixel shading variety of in shading values. The variety is small to the point that human eye can't recognize [6]. The most widely recognized case of lossy pressure is JPEG and Wavelet Coding. Lossy pressure is most usually used to pack sight and sound information like sound, video, and still pictures, particularly in applications, for example, gushing media [15].

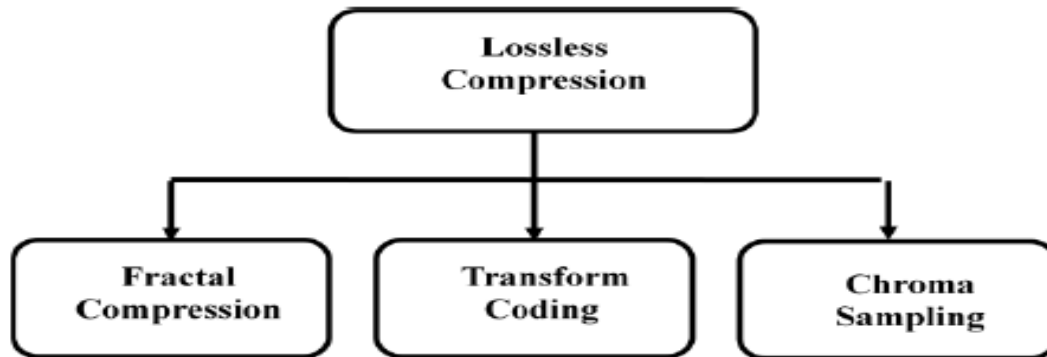


Fig. 2 - Types of Lossy Compression

## COMPRESSION ALGORITHM

### A. Run Length Encoding

One of the least difficult shapes in pressure procedure is run length encoding. The principle idea for run length coding is this that it changes the referred to images which are known as runs. The change obscure image is supplanted by single known and indistinguishable esteem [9]. The records which utilizes the most run length coding is TIFF, BMP, and so forth. It is a Lossless technique and Useful in fax application in which the majority of the information is spoken to by white spaces. For case, the content "1010000001" is considered as a source to pack, taken the initial 3 letters as a non-run having a length 3, and the following 6 letters taken as a run having length 6, since image 1 is rehashed therefore [10].

### B. Huffman Coding

Huffman coding relies on upon the run of likelihood conveyance. To build up a code words pixel estimation of likelihood circulation is utilized. In initial step recurrence is figured and afterward code is

allotted to it. Image with more likelihood gets short code. Toward the end parallel tree is made. The Huffman Coding is recognized from the Shannon Fano technique by its base up approach [12]. For ex, for taking after succession {p,q,r,s} the likelihood of grouping is {0.121,0.28,0.372,0.28}. Tree is made from left to ideal with two image of littler likelihood. Summation of two numbers must be identical likelihood of third. The procedure carries on till it cleared out to one [8]. The bits are numbered from ideal to left yet need is given to attach and afterward to others [9].

### C. Number juggling Coding

Among all procedure math coding is effective method for lossless statically encoding and increase considerably more consideration in couple of years. In number juggling coding as opposed to coding every picture pixel(symbol) exclusively, whole picture succession is allotted single math code word [13] A code word from interim 0 to 1 (0,1) is characterized. The yield from a math coding procedure is a solitary number under 1 and more noteworthy than or equivalent to 0. This single number can be

exceptionally decoded to make the correct stream of images that went into its development. To build the yield number, the images are characterized a set probabilities.

#### D. LZW

LZW is indicated by the name Lempel–Ziv–Welch created by Abraham Lempel, Jacob Ziv and Terry Welch in 1984. It is lexicon based pressure method which permits mapping of a variable length of picture grouping to settled length of code [14]. LZW calculation records the example in word reference. The initial 255 sections contain the estimation of ASCII subsequently the genuine distribution of file to the string begins from file 256. The primary working rule of LZW calculation is the various event of bit succession for a given picture that should be encoded. LZW calculation assembles a word reference by supplanting the different events of example by a file code. As it is versatile system so no compelling reason to transmit the word reference. At beneficiary side lexicon will be modified amid deciphering process.

#### IV. COMPARATIVE ANALYSIS

Relative examination for different picture pressure procedures is done subsequent to checking of pressure proportion or as far as time execution time of different calculations on different pictures.

##### A. Pressure Ratio

Pressure proportion is the proportion between the first size of the picture and the packed size of the picture it is ascertained as

Unique Size

$$\text{Pressure Ratio} = \frac{\text{Unique Size}}{\text{Compacted Size}} \quad (2)$$

Compacted Size

##### B. Pressure Time

Time taken for pressure and decompression must be mulled over as sometimes decompression time and now and again pressure time to be considered is important and at times those two are vital. Here we look at pressure proportion of Run Length Encoding, Huffman Coding, Arithmetic Coding and LZW calculations on different pictures. Table I demonstrates near examination for the strategies talked about in the paper for the pictures in fig. 2 alongside the application territory



(a)

(b)

Fig.3. (a) Image\_1 with original file size= 10,834 bytes  
(b) Image\_2 with original file size= 8392 bytes

Table 1

Algorithm	Image_1	Image_2	Application Area
	CR	CR	
Run Length Encoding	1.03	1.02	Used mostly for frequently occurring Sequences of pixels.
Huffman coding	1.57	1.19	Used in JPEG
Arithmetic Coding	1.84	1.58	Used in TIFF and GIF files
LZW	1.28	1.36	Used mostly for TIFF, BMP

## LITERATURE SURVEY

Sri kanth.S and Mehr S. (2013)" [16] Compression productivity for joining diverse implanted images"[1]In this paper we utilizing distinctive wavelet families and after that analyze the PSNRs and bit rates of these families. These calculations were tried on various pictures, and it is seen that the outcomes got by these calculations have great quality and it gives high pressure proportion when contrasted with the past exist lossless picture pressure strategy. In which we utilize the diverse inserted Wavelet based picture coding with Huffman-encoder for further pressure. In this paper they executed the SPIHT and EZW calculations with Huffman encoding.Nilesh B (2000)"image pressure utilizing discrete wavelet change" [17] this paper presents different procedures of picture pressure. In which we contrasting the execution of pressure procedure is troublesome unless indistinguishable information sets and execution measures are utilized. It is found that the lossless picture pressure method is best over the lossy pressure procedure. In which we examine

the distinctive kind of existing pressure techniques. In present time some different procedures are included with essential strategy. In some region the neural system hereditary calculation are utilized for picture pressure. Y.Suresh by any stretch of the imagination (2011)"lossless picture pressure in light of information collapsing"[18] The essential idea of information pressure which is connected to cutting edge picture and video pressure strategies, for example, JPEG, MPEG, and MPEG-4 et cetera. The fundamental thought of information pressure is to diminish the information relationship. By applying Discrete Cosine Transform (DCT), the information in time (spatial) space can be changed into recurrence area. In view of the less affectability of human vision in higher recurrence, we can pack the picture or video information by stifling its high recurrence parts however no changes to our eye do. We present a strategy called Motion Estimation (ME). In this technique, we find comparable piece of picture in past or future edges. At that point supplant the picture by a Motion Vector (MV) to diminish time relationship .Puate j and

Jordon F ("utilizing Fractal plan to insert a computerized signature into a picture" [19]. We propose another plan in light of a fractal coding and interpreting. A fractal coder misuses the spatial repetition inside the picture by building up a relationship between its diverse parts. We depict an approach to utilize this relationship between its diverse parts. Concerning a low pass sifting, the tests that have been performed for  $n=4$ , demonstrate some shortcoming against obscuring convolutions. However,  $n=8$  the procedure seemed, by all accounts, to be extremely vigorous, notwithstanding when the obscuring assault was trailed by a JPEG pressure. DwivediAn et al (2012), "A Novel Hybrid Image Compression Technique" [20] in this study, they consolidated the established wavelet based strategy with MFO-CPN. In this examination that Haar wavelet brings about higher pressure proportion however the nature of the remade picture is bad. In which db6 with a similar number of wavelet coefficients prompts to higher pressure proportion with great quality. General they found that the utilization of db6 wavelet in picture pressure out performs other two. In this plan a few tests are utilized to explore the helpfulness of the proposed conspire. Jassim F and Qassim E (2012) "Five modules strategy for picture pressure" [21] in this paper we changing over every pixel esteem  $8 \times 8$  pixel esteem. A different of 5 for each of RGB exhibit. After that the esteem could be isolated by 5 to get new values which are bit length for every pixel and it is less away space than the first values which is 8 bits. The benefit of their technique is it given high PSNR (crest flag to clamor proportion) despite the fact that it is low CR pressure proportion. This technique is proper for bi-level like highly contrasting

therapeutic pictures where the pixel in such pictures is displayed by one byte (8 bit).

## VI. CONCLUSION

Picture Compression is a vital field of research because of its extensive variety of utilization in picture handling zone. In this paper we played out a study on different lossless packing methods. Paper fuscous primarily on calculation recorded Huffman Coding, Run Length Encoding, Arithmetic Coding, and LZW. Relative examination is accommodated the talked about procedures in light of the pressure proportion accomplished by every system.

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