Quality Image Compression without Any Loss

U.Sowndharya Lakshmi, S.Tharanya, R.Tharagai, S.Kalaivani

Abstract— **Image compression using fractal technology based on image coding in similar image structure which implied on many fields of image recognition, retrieval of image and authentication using encryption and decryption. Complex encoding system having high computational complexity can publish its speeds up to their quality of image and its requirements. Blocks of fractal image processing equals its correlation coefficient where its ranges of pools in their chosen domains can be matched in the preset block. There are two encoding process that rushes significant schemes that preserves reconstruction of good image quality. The range block and domain block performs spatial correlation in image for obtaining local optima. In this paper, we propose preprocessing in one eighth of domain block number in fractal image compression reduces its pair wise comparisons between range and domain blocks. They are classified into three classes and this classification done with same method and its matching domain block which can be searched in the same class.**

Index Terms—**Fractal image compression, complex encoding system, correlation coefficient, local optima, range block and domain block.**

I. INTRODUCTION

Image compression in current researches concentrates son image processing and they are viable to its research area leading to the increasing need for multimedia transmission of data and storage. Lossy compression is a method that develops an automated algorithm which is to be termed as baseline of fractal image compression [1]. It proposes the classifying methods for determination of domain blocks.

From the existing information the matched range of blocks can be used for encoding process which calculates the spatial correlation between range and domain blocks. The algorithm based on inner product [2]. With the discrete cosine transform of removal of redundancy the existing block of eighth mapping domain can be computed by that algorithm. The fractal encoding of algorithm chooses faster process for domain block with range block as centre. Demanding the contents of multimedia in the growing image compression techniques interested in researching the digital images and video to the deep interest by the researchers.

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Development of quality of images which are higher in quality and less expensive acquisition of imaging devices can produce steady increase in both of the images size, its picture resolution and consequently its greater design for its compressions efficiency. A storage capacity for transferring the bandwidth can grow according to its compression requirement applications.

When a work of transforming domain from image compression in image for its various dimensions, its multiple spectral and high volume digital images which can analyze the compression system for suitable image processing, its storage and transmission of its computational complexity for its practical implementation [3].

To reduce number of bits need to represent an image with basic rule for compression can represent the array of numbers in which the integers can be more specific and termed as digital image. The arrays of images are rather two dimensional or its black and white and three dimensional of its color image. The compression algorithms exploit the redundancy of an image representing the low number of bits that can maintain the feasibility for different dimensions in their visual quality.

Related factors that are needed for compression of image include the requirement of large storage of multimedia data. Low power devices having small storage capacity for handheld phone transmits network bandwidths which are available at present [4]. The effect of computational complexity can have practical implementation over the image compression techniques which can reproduce the visual dimensions.

The array value represents the calculation for intensity of picture element or pixel whose values ranges from 0 to 255 which can only be positive integers. Each pixel of a black and white image acquires one byte of computer memory. When the image has grayscale resolution of 8 bits per pixel the primary colors have triple values. Usually the captured images are rectangle having the aspect ratio of 3 bytes of storage space. This aspect ratio makes the difference between standard definition television and high definition television. The corresponding aspect ratio in which the same picture having height remains same in both of the pictures that has number of rows remains same.

II. DATA COMPRESSION MODEL

A Data compression scheme is required for increasing efficiency in raw video data rates to bring them down efficiently and make them into manageable values. Mainly it comprises of three major steps that includes removal or reduction in redundant data, entropy reduction and encoding in entropy [5]. It can perform step by step transformation of image in its quantization with entropy of coding.

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JPEG for mostly compressed images for standard using discrete cosine transform for transforming the image from spatial domain to frequency domain. For high frequency of heavy quantization contains low visual information. It reduces the size represents the transformation with image quantization [6]. For further reduction of transformation redundancy follows its quantization of image data.

Storage for data reduction in the compression technique is the main advantage over data compression. There exist more approaches that reduce the cost for communication in transmission of bulk of data over long links. They have high and efficient utilization for the available bandwidth in data links. It helps in reduction of cost significantly which can communicate along with rate of data reduction due to its communication cost.

Data compression aids in rate reduction of data and it can also increases the quality for multimedia presentation through the limited communication channels along their convenient bandwidth. Due to data rate reduction for data compression for increase in the multimedia quality for presentation through limited bandwidth for communication channels in creating new opportunities. For offers given in compression techniques in the network of computers where the usage of internet is becoming more image friendly and graphical user friendly more than being just data centric or text centric.

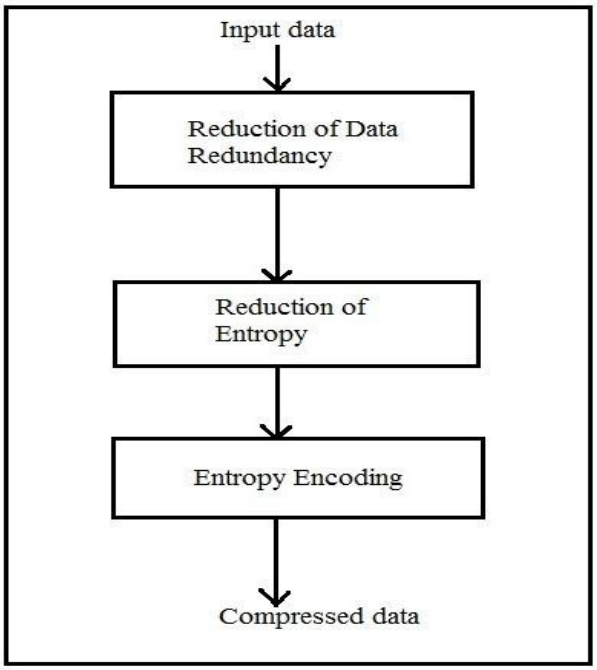

Fig.1 Representation of Data compression technique with reduced data redundancy.

This phenomenon creates many new opportunities for increasing the performance with creative applications where they maintain digital library, video teleconferencing and it can also archive digital data for entertainment. These are just the few advantages over data compression rather there are many secondary advantages over data compression has great implications over the access for data [7]. The enhanced data compression may helps in performance for more compressed records which can pack in buffer space given for implementing the traditional computer system.

Increase in the record of potential probability can be searched in the main memory where it can secure data using encryption for transmitting them separately. Data security can be compressed using decoding parameters along with database files which can restrict the proprietary information being accessed by the anonymous users. The next level of security can be achieved through transparent compression and decompression process of unauthorized users [8]. The input and output operations of a computing device can increase highly due to data representation in short.

Naturally the data compression reduces the backup cost and recovery of data in computer system as represented in Fig.1. It can store large database for backup files in compressed format. Reducing the cost for enabling the more multimedia applications could be the main advantage over data compression techniques.

Depends on sensitivity of data and area of application of data compression the extra overhead can be incurred. It mainly occurs in encoding and decoding process of data compressions in some areas are very serious drawbacks here. This kind of extra overhead requires data record reliability along with single bit error in code compression which can cause misinterpretation of a decoder along with subsequent bits which can lead to incorrect data production.

By transmitting the sensitive compressed data like information about any medicals through some noisy communication channel which can be a very risky wireless media. It can totally destroy the data transmission process by introducing burst errors in that noisy channel. Due to disruption of properties in the compressed data the original data differs with data compression can be a risky problem. In many system implementations the complexity of data compression can increase the cost of system and the efficiency will be greatly reduced in the area of applications which requires low power VLSI implementation.

III. ENTROPY BASED IMAGE COMPRESSION

In the digital image compression based on information theory principles. The concept of entropy in image compression used for measuring the amount of information can have source to produce the technique. The amount of information produced is termed as entropy. For every product having the symbol probability has its own logarithm for each symbol. There is a negative summation for all products in the entropy for given symbol set have set of compression algorithms. They create method for representing the information source sing the number of symbols. Thus the amount of space reduced have number of symbols to be stored in the source of information for representing the amount of time necessary to transmit the capacity for given channel in a data compression system.

The source of symbols mapping in the few target symbols refers to data compression can transform its target symbols back to the source of symbols representing the close approximation form for original information known as decompression for compression system [9]. It consists of two steps having sample for signal quantization. The compression algorithm considers the several choices for tackling conflicts arises. The degree of comparison requires data including the speed of operation. If anyone attempt for run programs in

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direct compressed data for decompression speed will be the paramount.

The size for compared value considers the compressed file for decompressed quality of image [10]. Compression is also known as encoding process and decompression is known as decoding process in digital data compression algorithms. They are classified into two compression categories known as lossless and lossy compression.

1) In lossless image compression algorithm the original data recovery can be done directly from the compressed data. The discrete data in general can be used as text or computer generated data which includes image and video information. It can achieve modest amount of data compressed which is not sufficiently used for high compression ratios. Examples of lossless compressions are GIF, Zip file format etc. Such methods are mainly helps reducing redundancy of data in original with no loss of data.

2) In lossy compression technique it refers to the loss of information which compresses the data and distorts the higher compression ratios which has possibility for comparing the lossless compression in image reconstruction. This lossy compression sacrifices the data exactly reproduces for better compression. It creates approximation in original removes redundancy. The degree of closeness measures the distortion defines the amount of information lost. Examples of lossless compression techniques are CCITT T.6, JPEG Baseline and JPEG 2000.

There are three main criteria for designing the lossy image compression ratio with acceptable distortion. The restriction on coding and decoding of time with different algorithms produces various types of distortion with the acceptability which is often application dependant. It has clear distortion increase and decrease in bit rate. A lossy compression is suitable for graphics and sound data which cannot necessarily reproduce exactly.

IV. Sorting and Rearrangement in Fractal Image Compression

Fractal image compression is an image coding technology based on local image structure having similarity of fractal images. They are mainly used widely in many fields such as image retrieval, de-noising images. It also includes authentication of images using encryption. It is proposed on the basic fact for defining the similarity between two blocks of fractal image which is equivalent for absolute value of

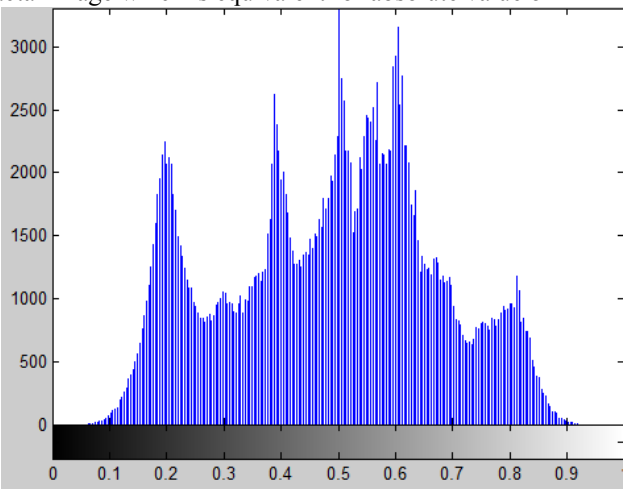

Fig.2 Histogram of Input data.

Pearson's correlation coefficient between all blocks in range and domain pools which are chosen and used for classification.

This coefficient correlation based on block of method classification for increasing the probability matching. The domains block sorting with respect to APCCs between these domain blocks and a preset block of each class. This kind of fractal compression suffers high computational complexity in encoding. The power of country MSE values can be calculated for all other countries existing in ICA algorithm.

Fractal Image Compression (FIC) is recognized as NP-hard problem and this kind of computations suffers a high number of mean square errors. Their approaches were of two stages which perform spatial correlation in image for both range block and domain block so which can be obtained using local optima.

The total number of domain block in the three domain classes are only one eighth of the domain blocks in BFIC. It can greatly reduce the pair wise comparisons between the range blocks and domain blocks. All these blocks are classified into three classes which commonly reduce the pair wise comparisons. It also classifies the same method with its matching domain block which can be searched in the same class.

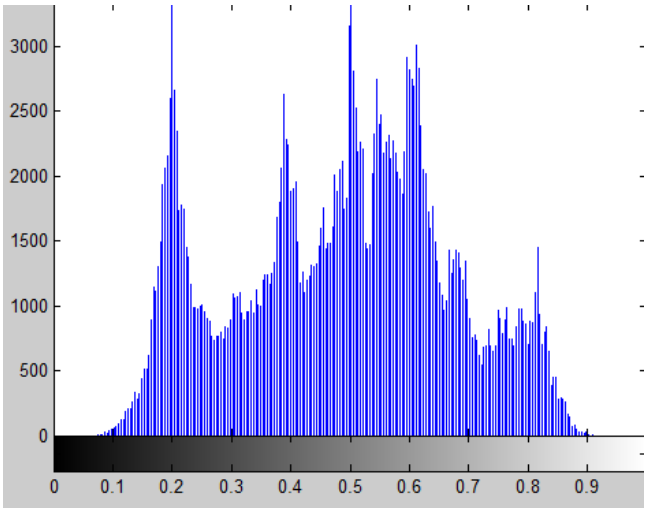

Fig.3. Reconstructed Histogram.

The eight transformations applied to octuple the block number of the domain pool. This octupling blocks leads to computational complexity in searching the matching pairs. Without enlargement of domain pool the other eight transformations are called as crude domain pool and those with enlarged transformations are known as BFIC domain pool. The index block of crude domain pool in the transformation of class belongs to transformed domain blocks which retain its image encoding.

V. Transformation-Correlation Coefficient

The new Fractal image compression technique in our proposed method based on the fact that the affine similarity between two blocks of image compression data is equivalent to the absolute value of Pearson's correlation coefficient

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(APCC) between them. There are two more classifications which makes this coefficient correlation into fractals. First of all the blocks in the range and domain pools are chosen and classified using an APCC based block classification method. This helps in increasing the matching probability for all the blocks.

Second main thing will be by sorting the domain blocks with respect to APCC between these domain blocks and a preset block in each class, the matching domain block for a range block can be searched in the selected domain set in which these APCCs are closer to APCC between the range block and the preset block.

A novel fractal compression scheme can be proposed to meet both quality of a reconstructed image and its efficiency requirements at the same time. Naturally this scheme based on fact that affine similarity between two image blocks in fractal image compression equivalent to absolute value of correlation coefficient between them whether the image measurement is MSE or SSIM. This should be an efficient feature that speeds up encoding because of its similarity. Some other strategies like synthesis with other technologies and sorting with some features were applied for speeding up the encoding process in fractal image compression. Moreover these are variance based block sorting scheme proposed for efficient encoding in reconstructed image quality.

VI. CONCLUSION

In this paper we propose the over-long encoding time in fractal image compression is one of the major problems for its application. Although many researches were published to speed up encoding of FIC, the encoding time is still long, and in some schemes the reconstructed image quality becomes unacceptable. Based on the conclusion that the affine similarity between two image blocks in FIC is equivalent to the absolute value of Pearson's correlation coefficient between them, a new FIC scheme is proposed in this paper. Firstly, the Fisher's 3 class method, which has been proved to be an APCC-based on block categorization method in this paper, is used to greatly reduce the number of blocks in the domain pool and classify the remaining domain blocks into 3 classes. Secondly, the domain blocks are sorted by APCCs between each domain block and the preset block in each class, and then the matching block for a range block is searched in a domain set selected by APCC with the preset block.

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