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A Survey on: An Efficient and Secure Fractal Image and Video Compression

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ABSTRACT: Compression is nothing but the reducing the size of file or any document , The Image compression is to reduce the size of graphical file without disturbing its quality. Depending on the compression ratio the reconstructed image has to be exactly same as the original or some unspecified loss may be cause. Image and Video compression is an essential technology in multimedia and digital communication fields. Ideally, an image compression technique removes unnecessary and unrelated information, and efficiently encodes what remains. It is necessary to throw away both on redundant information and relevant information to achieve the compression. The existing image compression algorithm is based on the correlation between adjacent pixels and therefore the compression ratio is not high. But the correlation not only exists in adjacent pixels within a local region, but also in different regions and local regions with global regions. The fractal schemes is based on the self-similarities that are built in many real world images for the purpose of encoding an image as a collection of transformations .The combined DCT and Fractal Image Compression approach to perform the video compression with scalability vector. The DCT will use these weighted values as DCT coefficient. Fractal video compression follows the property of self-similarity. That's the biggest reason for high compression ratio.

KEYWORDS: Image compression, *DCT*, fractal image compression Peak Signal to Noise Ratio (PSNR), Structural Similarity Index (SSIM) and Universal Image Quality Index (UIQI)

I. INTRODUCTION

Image processing is a quickly developing field with universal use in the domain of mobile technology. An increasing number of products like cellular phones, smart phones, laptop computers and cameras used in transmit and receive videos and images by means of portable wireless devices. The demand for efficient techniques that can store and transmit visual information has been increased by the increasing use of color images as well as video in the continuous growth of multimedia application. Because of this demand, image compression has become a important factor and the requirement for efficient algorithms that can gives large compression ratio with low loss has increased. We are downloading image files from the internet can be an extremely time consuming task. In multimedia communication, a major portion of the communication bandwidth is occupied by image data because they are the major portion of the multimedia data. Hence, formation of efficient techniques for image compression has become reasonably important.
Image compression reduces the size in bytes of a graphics file without spoiling the quality of an image beyond acceptable limits. It also, decreases the time taken to send images via the Internet or downloaded from web pages.
In this paper we have discussed about the various fractal image compression techniques.

II.RELATED WORK

In [1]The technique of Genetic Algorithm (GA) is applied for Fractal Image Compression (FIC) with the help of this algorithm to reduce the search complexity of matching between range block and domain block. One of the image compression techniques in the spatial domain is Fractal Image Compression but the main drawback of FIC is that it has a more computational time due to global search. In order to improve the computational time and also the suitable quality of the decoded image, Genetic algorithm is developed. The Genetic Algorithm is a better method than the acceptable exhaustive search method[8]
The research done by William Robson Schwartz [2] proposed method based on robust feature descriptors to speed up the encoding time. The classification search approach based on a quad-tree technique. For each level of the quad-tree decomposition, domain blocks are group together and only those belonging to the closest of that group to a given range

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block are considered as candidates to a match. The procedure to encode an image using fractal compression The use of strong features provides more characteristic and typical information for regions of the image. When the regions are better represented, the search for similar parts of the image can be reduced to focus only on the most similar matching region, which gives to reduction on the computational time. The experimental results show that the use of robust feature descriptors reduces the encoding time while keeping high compression rates and reconstruction quality.

In A Combined DWT-DCT approach to perform Video compression base of Frame Redundancy[3] approach is about the up-down sampling based approach. Here presenting a combined DWT-DCT approach to perform the video compression with scalability vector. The DWT will perform the adaptive filtering and DCT will use these weighted values as DCT coefficient. The DCT and DWT approach will gives the high degree of compression ratio. It will give the compression approach to reduce the media size and Improve the video compression by improving the frame based similarity and the correlation.

In [4] Combination of DCT and fractal image compression techniques is proposed. DCT is employed to compress the color image while the fractal image compression is employed to evade the repetitive compressions of similar blocks. Similar blocks are found by using the Euclidean distance measure. Here, the given image is encoded by means of Huffman encoding technique. The implementation result shows the effectiveness of the proposed scheme in compressing the color image. Also, a comparative analysis is performed to prove that our system is competent to compress the images in terms of Peak Signal to Noise Ratio (PSNR), Structural Similarity Index (SSIM) and Universal Image Quality Index (UIQI) measurements.

The APPCC [5] proposed based on the fact that the allowing for similarity between two blocks in FIC is equivalent to the absolute value of Pearson's correlation coefficient (APCC) between them. First, all blocks in the range and domain pools are chosen and classified using an APCC-based block classification method to increase the matching probability. Second, by sorting the domain blocks with respect to APCCs 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. Experimental results show that the proposed scheme can importantly for speed up the encoding process in FIC while preserving the reconstructed image quality well.

III. PROPOSED ALGORITHM

In the proposed system we are going to build a Fractal compression system which will provide the ability of the image compression as well as video compression with high compression ratio. The image compression and Video compression technique can reduce the storage and transmission costs. In order to overcome existing system difficulty and to compress the image efficiently as well as video also compression also possible. The proposed system provide an efficient and secure fractal image and video compression. The proposed system will consist of different modules. In this system data is nothing but the Image or Video with the size PSNR ratio of the image and Frames, frame size ,no. of frames and also the PSNR ratio of the video. The data collection will be done through "Data collection module", The "Preprocessing Module " will define and read the input image as well as video. And "Compression Module", will process of the compression.

Following will be the step to involved in fractal compression:

Step 1: Read the Input Image or Video
If image go to step 6
Step 2: Read the Video Features and Compression format,
Step 3: Find the Number of Frames in Video ,each frame is nothing but the Image, N
Step 4: counting the frame one by one to [Repeat Steps 5 to 7]
Step 5: Get the no. of Frame from Image called FrameImage
Step 6: If first frame Then Write FrameImage to seprate Folder Else

6.1 Implement the Convolution Filter on FrameImge(no.) and FrameImage(no.-1)
6.2 Perform the Simalrity measure called Riez transformation to extract the internal image features
6.3 Perform the Edge Detection on both images
6.4 Create the structured Mask on both images
6.5 Implement the Similary measure and return the similarty vector between 0 and 1

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Step 7: If SimilaryVector(FrameImage(no.),FrameIm age(no.-1))=1 { Discard the Similar Image }
Step 8: Create an empty Video file Video1
Step 9: Now we get all the absolutely different images in a folder imgfolder
Step10: if the frame no is first then to Length (imgfolder) {
Step 11: Read Image img (no) from folder
Step 12: Add the image img (no) in Video1 }
Step13: Save the video and show the result }

IV. CONCLUSION AND FUTURE WORK

In " An Efficient and secure fractal image and video compression" it can be used efficiently to implement images and video will compressed effectively using DCT. Generally, the DCT based compression technique produce some blocking artifacts. Here, the artifacts were removed by utilizing the fractal image compression method. Also, the self similarities between the analogous blocks were found by using the Euclidean distance measure. So, this eliminates the continual compression of analogous blocks. From the implementation results, the proposed system was efficient in compressing the images. Also, the proposed system technique will be successfully compressed the images and video with high PSNR value, SSIM index and the UIQI value.

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