A Novel Parallel Compression with Discrete Cosine Transform

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Abstract: **Compression of an image is always an interesting research issue in the field of image processing. Parallel image compression is a good solution to improve image compression rate. In this paper we propose a secure and parallel image compression technique over images. Initially image can be segmented and performs parallel image compression with Discrete Cosine Transform (DCT).Our proposed model gives more efficient results than traditional approaches.**

I. INTRODUCTION

Stereoscopy is called any technique which is capable of creating the illusion of a three-dimensional image. In image graphs or movies the illusion of depth is created by presenting a different image to each eye.The human eyes are close to each other (approximately5cm). Thus every viewed object has a slightly different viewing angle in each eye. If two artificial created images have the same angle difference called the deviation, and each eye sees only the corresponding image, a special effect is created.

An image is an optical representation of the object by radiation source. Stereoscopic images are mainly applied in digital cinema, and medical surgeries. And it has be using for decades for many applications. In many applications such as television and gaming applications and stereoscopic displaying is also available. This is the process of two images in different positions such as human brain fuses the two images to create an image as stereoscopic images. In stereoscopic images, the process of making is left and right images are sequentially displayed as clock wise and anti-clock wise. Image processing is a method of signal processing. Its output is related to images and input as image parameters. Its main aim is bit compression which increases the image quality. The scalability of the images refers to a quality reduction and that is achieved by bit stream only.

A second target is to propose a straightforward technique for measuring the crosstalk portion and termination proportion that depends on seeing test designs on the application without the requirement for electronic or optical instruments. Our trust is that this instrument can be disseminated broadly and will prompt the gathering of reliable data around stereoscopic presentations, and in this way, to the creation of the most ideal stereoscopic showcases.

Three-dimensional space (additionally: 3-space or, once in a while, tri-dimensional space) is a geometric setting in which three qualities (called parameters) are required to decide the position of a component (i.e., point). This is the main importance of the term measurement. In physical science and arithmetic, an arrangement of n numbers can be comprehended as an area in n-dimensional space. At the point when n = 3, the arrangement of every such area is called three-dimensional Euclidean space. It is normally spoken to by the image. Moreover, for this situation, these three qualities can be marked by any blend of three looked over the terms width, stature, profundity, and expansiveness.

The above concept is mainly used to prepare stereoscopic images. Stereoscopic graphics are regularly alluded to as stereoscopic models. Aside from the rendered realistic, the model is contained inside the graphical information record. Nonetheless, there are contrasts: a stereoscopic model is the numerical representation of any three-dimensional item. A model is not in fact a realistic until it is shown. A model can be shown outwardly as a two-dimensional image through a procedure called stereoscopic rendering or utilized as a part of non-graphical reproductions and computations. With stereoscopic printing, models are also rendered into a physical representation of the model, with constraints to how exact the rendering can coordinate the virtual model.

II. RELATED WORK

Even though various traditional approaches proposed by the various authors from years of research, every approach of compression techniques have their own drawbacks and advantages. Compression rate and time complexity or time taken to compression an image is important factors while compression of image.

Disadvantages:

- Traditional compression of image rate time complexity is more
- No parallel compression mechanism
- Not an optimal transmission with cover images.

There are many techniques for compression of images. Image compression might be lossy or lossless. Lossless compression is favored for documented purposes and frequently for medicinal imaging, specialized drawings, cut workmanship, or funnies. Lossy compression techniques, particularly when utilized at low piece rates, present compression ancient rarities. Lossy techniques are particularly reasonable for regular images, for example, images in applications where minor (now and again indistinct) loss of constancy is adequate to accomplish a significant lessening in bit rate. The lossy compression that producible contrasts might be called outwardly lossless.

This serves as a three-parameter model of the physical universe (that is, the spatial part, without considering time) in which all known matter exists. In any case, this space is one and only case of a vast assortment of spaces in three measurements called 3-manifolds. In this established illustration, when the three qualities allude to estimations in various headings (arranges), any three bearings can be picked, given that vectors in these bearings don't all lie in the same 2-space (plane).

This requires some practice, however after this; anybody ought to have the capacity to view stereo images. The thought is that the pair of images ought to be isolated by around the same separation as that of your two eyes. At that point, you need to look to boundlessness, while pleasing your eyes on the nearby combine of images. The settlement you will do naturally, however this is an irregular condition of your eyes (as a rule when your eyes center to boundlessness, they additionally suit to endlessness).

Focusing to infinity while accommodating to a nearby image is what you have to practice. Do this by identifying two objects in both images which are the same. Then gradually relax your focus. Do not keep focusing on the images. You will notice that the two objects which you were looking at, seem to merge together. They should merge over each other, and not have a top/bottom asymmetry (if there is, tilt your head until they are on the same line). As soon as they merge, keep your focus, try to look at something in the image which you know is almost at infinity, wait a few seconds, and the full 3D picture will come into view. If you are unable to get the 3D-picture, try the method while sitting closer to or further away from the image.

III. PROPOSED WORK

We are proposing an efficient and parallel image compression technique, it initially divided into block and apply the compression mechanism parallel and combine after compression mechanism. Data can be embed into the cover image securely in the least significant bits, before data embedding ,data can be encoded with cryptographic model and at receiver end it can be segmented again and decompress and decode the data from cover image.

Advantages:

- Parallel compression mechanism improves the performance
- Time complexity to compress is less
- Secure transmission of data with cover image is optimal

Data Embedding:

LSB (Least Significant Bit) substitution is the method of processing the LSB bit pixels of the carrier image. It is a simple method for embedding message and the image. The LSB insertion varies according to number of bits in an image. For an 8 bit image, the least significant bit i.e., the 8 th bit of each byte of the image is changed with the bit of cipher text. For a 24 bit image, the colors of each component like RGB (red, green and blue) are changed. LSB is effective in using BMP images since the compression in BMP is lossless.

Image Compression:

We compression the image with parallel discrete cosine transform, it improves the compression rate and reduces the time complexity to compress and decompress the image.

1. Take an image and divide it up into 8-pixel by 8-pixel blocks parallel from both ends. If the image cannot be divided into 8-by-8 blocks, then you can add in empty pixels around the edges, essentially zero-padding the image.
2. For each 8-by-8 block, get image data such that you have values to represent the color at each pixel.
3. Take the Discrete Cosine Transform (DCT) of each 8-by-8 block.
4. After taking the DCT of a block, matrix multiply the block by a mask that will zero out certain valuesfrom the DCT matrix.
5. Finally, to get the data for the compressed image, take the inverse DCT of each block. All these blocksare combined back into an image of the same size as the original.

Key Generation:

Diffie-Hellman is the one of the most efficient key exchange algorithm is used where users are expecting data confidentiality and security during the transmission of the data .In this protocol of example we are considering two users Alice and Bob.

• Initially they are agree on two public prime numbers p and g from the both ends. Gis also known as the generator

• Alice selects a secret integer ‘a’ and calculates and calculates $x = g_a \bmod p$ and forwards the x to Bob

• Similarly Bob selects a secret integer ‘b’ and calculates $y = g_b \bmod p$ and forwards the y to Alice

• Now alice calculates the below with the received Y from Bob to achieve final session key

Y_a mod p

• Bob calculates the below with the received X to achieve final session key at Bod end

X_b mod q

Steganography and Cryptography are closely related constructs. The hidden or embedded image, audio or a video files act as carriers to send the private messages to the destination without any security breach. Steganography techniques can be implemented on various file formats such as audio („.mp3‟, „.wmv.‟, etc.), video(„.mpeg‟, „.dat‟, etc.) and images („.jpeg‟, „.bmp‟, etc.). However, the images are the most preferred file format for this technique. At present, there are a lot of algorithms that help in executing the steganography software.

Encoding and Decoding:

Triple DES is the common name for the Triple Data Encryption Algorithm (TDEA) block cipher. It is so named because it applies the Data Encryption Standard (DES) cipher algorithm three times to

The standards define three keying options:

- Keying option 1: All three keys are independent.
- Keying option 2: K1 and K2 are independent, and K3 = K1.
- Keying option 3: All three keys are identical, i.e. K1 = K2 = K3.

Keying option 1 is the strongest, with 3 x 56 = 168 independent key bits.

Keying option 2 provides less security, with 2 x 56 = 112 key bits. This option is stronger than simply DES encrypting twice, e.g. with K1 and K2, because it protects against meet-in-the-middle attacks.

Keying option 3 is no better than DES, with only 56 key bits. This option provides backward compatibility with DES, because the first and second DES operations simply cancel out. It is no longer recommended by the National Institute of Standards and Technology (NIST) and not supported by ISO/IEC 18033-3.

IV. CONCLUSION

We have been concluding our current research work with efficient and parallel image processing technique and secure data encoding and key generation mechanism. Image compression can be efficiently with DCT and key can e generated with Diffie hellman key exchange protocol and data can be securely transmitted through Triple DES cryptographic algorithm.

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