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AN EFFICIENT MULTIPLE DATA COMPRESSION TECHNIQUE

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ABSTRACT

In today's internet world, compression of data is required for effective and secure transmission. Data in uncompressed form requires more storage and transmission bandwidth. Data compression involves encoding information using fewer bits than the original representation to reduce resource usage, such as memory space and transmission time. Choosing efficient data compression technique is most important. Here we propose application that compresses the data multiple times to make the size of the data much smaller than the original data and the compression ratio reduces each time the data is being compressed. Decompression which is the reverse process of compression gives back the original data, which was compressed multiple times.

KEYWORDS: Data compression, Transmission time, Memory, Bandwidth.

INTRODUCTION

In the last decade we have been seeing a revolution in the way we communicate and still it is continuing. This transformation is along with the ever-growing Internet. The development of mobile and video communication is increasing day by day. Data compression is one of the techniques for each of these aspects of multimedia revolution. It would not be practical to put the images, video, audio on websites if it were not for data compression algorithms. Cellular phone communication, the advent of digital TV would not have been possible without compression. The technique of data compression is used in every field of technology from music on MP3 to modem. Data compression may be viewed as a branch of information theory in which the primary objective is to minimize the amount of data to be transmitted. A simple characterization of data compression is that it involves transforming a string of characters in some representation (such as ASCII) into a new string which contains the same information but whose length is smaller than the original string. Data compression has important applications in the areas of data transmission and data storage[1]. The technique of data compression has been classified into two major categories:

- Lossy compression
- Lossless compression

Lossy data compression concedes a certain loss of accuracy in exchange for greatly increased compression [2]. This type of technique is usually applied in graphics images and digital voice. The output of the compression is not as same as the original data. Lossless compression consists of the techniques which are guaranteed to generate an exact duplicate of the input data stream after compress and expand cycle. This type of technique is usually used in storing database records, spreadsheets or word processing files. In these applications a loss of even a single bit could be catastrophic. Historically, data compression was not one of the first fields of computer science [3]. It seems that workers in the field needed the first 20 to 25 years to develop enough data before they felt the need for compression. Today, when the computer field is about 50 years old, data compression is a large and active field, as well as big business. Principles, techniques, and algorithms for compressing different types of data are being developed at a fast pace by many people and are based on concepts borrowed from disciplines as varied as statistics, finite-state automata, space-filling curves, and Fourier and other transforms.

EXISTING SYSTEM

The existing systems application use Discrete Cosine Transforms (DCT), Fast Fourier Transform (FFT), Wavelet Transforms, Prediction Methods which are good in compressing the data only once and their performance can deteriorate when tried to compress repeatedly. This is a major drawback of the existing compression techniques.

PROPOSED SYSTEM

The system been proposed develops a software which helps in compression of data repeatedly. The data can be in any form, such as text, image, etc [4]. In order to get back the original data we need to know how many times data has been repeatedly compressed. The size of the compressed data is always less than the original data in every repetition of the compression process.

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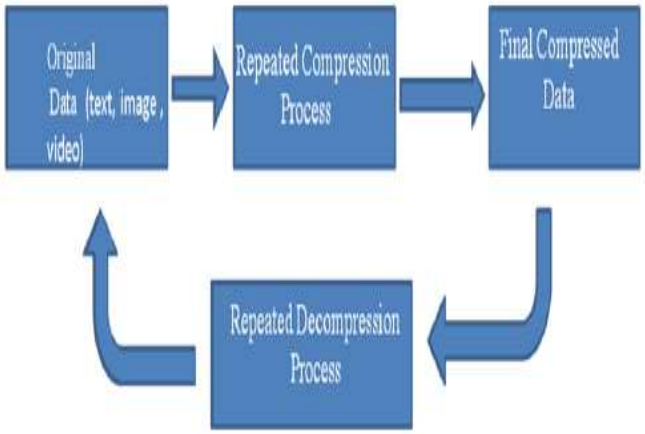

Figure 1.Process of compressing the data.

Algorithm for compression of image

- Step 1: read the input image file
- Step 2 : read N (count)
- Step3 : read four pixels at a time go to step4
- Step4: if all the pixel values are same, represent it as 00 and binary value of any one pixel. Else if only two values are there then represent it as 01,binary value of one pixel, binary value of another pixel and order of pixels either 0 or 1.Else if three values are same then represent it as 10 and binary value of 1st pixel, binary value of 2nd pixel, binary value of 3rd pixel and indication of pixel if repeated 1 else 0 else represent it as 11 with binary value of any 3 pixels, and representation of those pixels [5].
- Step 5: repeat step 3,N number of times
- Step 6 :Stop

Advantages of proposed compression technique

- The amount the disk space required is less.
- Compression obviously reduces the cost of backup and recovery of data in computer systems by storing the backup of large database files in compressed form.
- The rate of input-output operations in a computing device can be greatly increased due to shorter representation of data.
- Compressed data increases the speed of reading and writing.
- It can increase the speed of file transfer.
- It reduces the data storage requirements.

RESULTS

The figure 3.1 is the snapshot of the user interface, where user can browse the file to be compressed and can select the no of times the file to be compressed. Similarly the process repeats for decompression. The figure 2, 3 are uncompressed images of size 512*512 are considered for multiple compressions. The below figure 2.1, 3.1 are images after decompression [6][7].

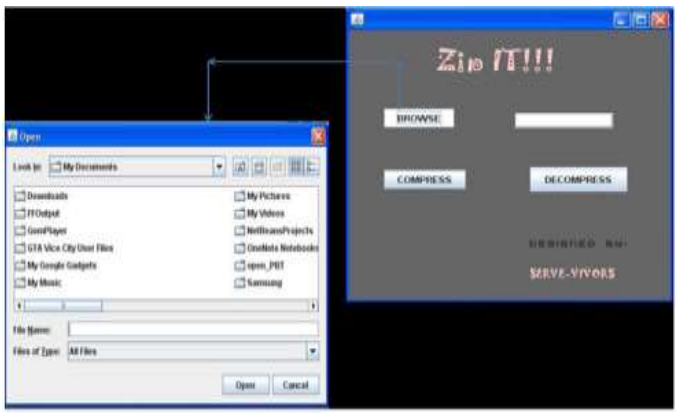

Figure 3.1: Snapshot of user interface.

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Figure 2: Input image of size 512*512

Figure 2.1: Image after decompression of same size 512*512

Figure 3: Input image of size 512*512

Figure 3.1: Image after decompression of same size 512*512

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CONCLUSION

The objective of the present study was the compression of compressed data uses the lossless data compression technique with the help of this project very large size is reduced to very small size. There are no existing algorithms which work on compression of compressed data, the project works on any windows environment. The data transmission speed can be increased. In future with the help of data encryption to the compressed data great level of security can be achieved to very large size data. Data compression and encryption can provide secure and fast transmission of data. As this project gives very good compression ratio, smaller the size of data easier is the data transmission.

FUTURE SCOPE

In future with the help of data encryption to the compressed data great level of security can be achieved to very large size data. Data compression and encryption can provide secure and fast transmission of data. As this project gives very good compression ratio, smaller the size of data easier is the data transmission.

REFERENCES

[1] Khalid Sayood, "*Introduction to Data Compression*", 3rd Edition, Elsevier publication, 2010.
[2] Mark Nelson, "*The Data Compression Book*", 1st Edition, BPB publication, 1993.
[3] David Salomon, "*Data Compression the Complete Reference*", *4th Edition, Springer publication*, 1993. T.C. Bell, J.G. Cleary, and I.H. Witten. Text Compression. Advanced Reference Series. Prentice Hall, Englewood Cliffs, NJ, 1990.
[4] B.L. van der Waerden,"*A History of Algebra" Springer-Verlag*, 1985.
[5] T.M. Cover and J.A. Thomas, "*Elements of Information Theory*" Wiley Series in Telecommunications John Wiley and Sons Inc., 1991.
[6] T. Berger "*Rate Distortion Theory: A Mathematical Basis for Data Compression*" Prentice-Hall, Englewood Cliffs, NJ, 1971.
[7] A. Gersho and R.M. Gray "*Vector Quantization and Signal Compression*" Kluwer Academic Publishers, 1991.