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Adaptive Lossless Compression

Abstract

Compression is very important concepts now a days due to all are online in nature. Everybody needs everything in very short speed and early as early possible. This paper discusses adaptive lossless image compression and text compression which send the data online as compressed form and at receiving end same data can be obtained. Model based image compression is based on adaptive Huffman coding. Adaptive comes from dynamically updating.

Keywords: Image Compression, Compression Ratio, Lossless Image Compression.

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Introduction

Compression efficiency is directly proportional to quality of image. Lossless image compression and text compression retrieve the same data after compression. Main applications of lossless image compression are in medical, astronomical, scientific, professional video processing application images etc. Lossless image compression technique sends the data as a character in the text data and intensity in the case of image data. Initially it sends first character to the receiver end and generates a Huffman tree for that data and store the character in the tree in left or right side. If same character again occurs in the text or image then it send the different code according to the character present in the tree to the receiver side. Adaptive lossless image compression is a user defined set of functions that allows the transmission of data. The level of compression is constantly adapted according to the plateform provided. Image compression is a viable approach towards preserving energy by reduction of the height. Adapting refers here changing of the compression level during the transmission.

Related Work

Boncelet et. al researched using three entropy coding methods for lossless image compression applying digitized radiographs and dicscovered that a bit rate of about 4 to 5 bit per pixel is best. Tavakoli, used number of lossless coding techniques to Magnetic Resonance images and reported a compression down to about 5 to 6 bit per pixel, with Lempel-Ziv coding receiving the best results. Lossless compression works with non-correlated data. Roose et. al. researched prediction, linear transformation, and multiresolution methods for non-correlating medical image data prior encoding . The compression result was 3:1 in angiograms and less than 2:1 in MRI. Kuduvalli and Rangayyan worked on similar techniques and discovered linear prediction and interpolation techniques fetches the best results with similar compression ratios.

Paper is divided into number of sections for better understanding of the methods and techniques. Section II describes lossless image compression methods. Section III **describes Framework for Adaptive Lossless Compression**. Section IV tells experimental performance. Section V shows conclusions.

Adaptive Lossless Image/Text Compression Methods

Image compression/text compression provides a bandwidth savings related to sending smaller amount of data over the internet. This method is applicable for images, audio and video compression. It also saves storages space and provides a higher level of security and monitoring.

Lossless compression methods are usually two-step algorithms:

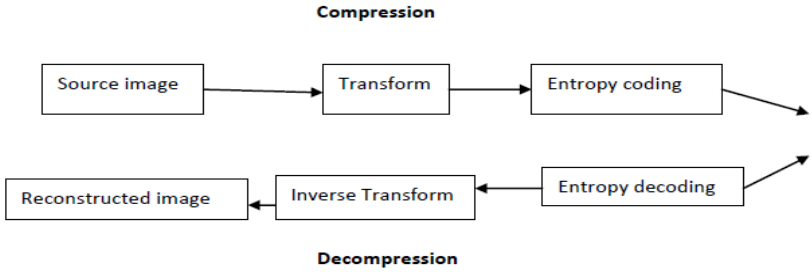

Fig:1 Lossless Image Compression

1. Qriginal text/image transforms to other format where the inter-pixel redundancy is reduced.
2. Process uses an entropy encoder to remove the coding redundancy.

Medical images can be compressed to about half of their original size without destroying the data. In this way diagnose is easy and fast can be done in every where through the nation. Lossless image compression methods result in no loss in the compressed images so that it can perfectly restore the original images when using a reversible process is applied so both encoding and decoding are same. Compression ratio measure the quality of image how much storage amount is reduced. Other factors are bit rate, mean square error and sum of absolute difference.

Coding redundancy can be used in variable length code schemes like Huffman coding and arithmetic coding.

Inter pixel Redundancy is a redundancy corresponding to statistical dependencies among pixels, especially between neighboring pixels.

Psycho visual redundancy is a redundancy corresponding to different sensitivities to all image signals by human eyes. Therefore, eliminating some less relative important information in our visual processing may be acceptable.

Conclusion

Best compression is the compressions which reduced the size of contents as well as increase the transmission speed. In this way we conclude that during compression of a online data it give better response comparative to the static compression. Static compression need time to change the variable length code of each symbol in the complete contents after that it send the symbols according the bits has been set. But Dynamic compression dynamically allocate bits incoming during scanning and it simultaneously decode the bits using tree.

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