Memory Optimization of Map Image

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Abstract: In this paper study the compression method for digital map images. The digital maps are stored and distributed electronically using raster image compression format. In this paper study the different compression technique for the digital map images, which support storage size, decompression of image and smooth transition. For the compression number of methods are used, in this describe the compression technique with their factor. The system is therefore capable of improving the overall performance of the system under test.

Keywords: universal codebook, row-column reduction, Discrete wavelet transform, discrete cosine transform

I. INTRODUCTION

An image is defined as a matrix of pixel or intensity values.Image compression is used for reduce the redundancy and randomness present in the image; it will increase the storing space and efficiency level of the images.To remove the redundancy to compress any images. There are two types of compression that is lossless and lossy compression technique.if any pixel value is changed from a digital image and then energy will be lost and this technique is call "lossy compression". The amount of information retained by an image after compression and decompression is known as "lossless compression". Digital map are stored in vector formats which are normally obtained from spatial databases. The visual overlook of maps representing the same region varies depending on the type of the map (topographic or road map), and on the desired scale (local and regional maps). Single map images are replicateeach scale separately and it keeps as single raster images increase with the location information of the map. A map image use color tones with high spatial resolution for representing the information of image like road, infrastructure and places detail. For reducing the objective redundancies used traditional hybrid coding architecture for achieving compression. In our daily routine numbers of images through printed or online area such as newspaper, magazines, etc., we are not remembering such a large amount of visual information of image. Only saliency uses for image compression. To give results in loss of memorable regions that is also important for number of applications. Therefore we use this concept for perceptual visual compression of images which preserves the memorability of the images.   In the vector image compress uses a file size 150kb, typical map images compress by factor of about 20:1. Form the previous compression   techniques the complete image must be decompress in memory before the image can be viewed.

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The techniques to keep these memorable regions, the salient regions should be memorable because it is noticed by the human. Some of the perceptual coding techniques is used the saliency for region selection in images. Saliency is based on the contextual information of a scene. It gives information about the unique or distinct regions in an image.

II. LITERACHURE REVIEW

Researchers do work on multiple image compression technique in that lossy and lossless compression is present. To improve the redundancy, reduce cost for storage and transmission. Techniques are used which preserve the memorable region in an image, for perceptual visual compression of image.   Saif alZahir[1] describe the lossless compression technique use for the format of raster map images having a different number of discrete colors. In that use universal codebook with symbol entropy and row-column reduction coder. In this paper compression technique use for map and chart images, that has a perceptually distinguishable number of different colors. In that use compression ratio for the image is 0.036 bits per pixel, it will be greater than other image like JPEG.   In [2] the author using DCT and DWT for JPEG and PNG image for reduces the irrelevance and redundancy of the image data able to keep or transmit in an effective from using the algorithms. In this paper compare the image compression technique of DCT and DWT algorithms. In that proposed DWT and inverse DWT for compression. For this only JPEG and PNG images used for compression.

The khosala and ziao [3]describe the a novel framework technique for the image memorability, n this introduce how memorability of image regions and various types of features fade over time, method offering memorability maps which are interpretable than [7].A long term human visual memory which can store some amount of visual information, it tends to degrade over time. The exposure of high scale image collections and increasing demands in storing, organizing, interpreting, and summarizing large amount of digital information. In [4] authors discuss the phase spectrum of quaternion Fourier transform (PQFT) offer To recognize proto-object, in this used multi-resolution wavelet domain foveation filter for hiding the unwanted coefficients. In this paper figure out the spatiotemporal saliency of map image by the quaternion representation. The quaternion representation of image which easily compose rotation, intensity, color, and motion factor are composed. Phase spectrum of quaternion Fourier transform (PQFT) method is describe, in that evaluate the spatiotemporal saliency map image by its quaternion representation called a novel multiresolution spatiotemporal saliency detection model. The human eye will typically focus on which Salient region in natural scenes are normally consider as areas and verify these areas in the object detection step.

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In this cover the features as a quaternion image which is superior than the every factor are processing separately, because some factors cannot "pop out" they are calculate every side. The spatiotemporal saliency map method show the PQFT model, it deal with videos, natural images and psychological patterns. These pattern are superior than other models, in this shows PQFT saliency detection model is effective model. In [5], this paper discusses the memorability of an image dataset, it was marked and some element conduct for this memorability. analyze the part of the visual observation in image memorability about the axis. To finish the given period of time recollect the image memorability. The eye-tracking experiment result work on the dataset of images of various memorability points. It look over axis is predictive and the attention-related feature advantageously exchange low-level quality in image memorability projection. The role of visual observation is important and it taken along with further low-level features. Author proposedone approach related to memorability but can't find the relation between attention and memorability. Attention might play an important part in memorability both from experimental and predictive view when it taken together with other features. Proposed the eye-tracking experiments with subset of image dataset.

In[6],the author develop a convolutional neural network(CNN) based image compression method it suited with JPEG-2000.in this paper reuse of JPEG-2000 encoder to achieve bitstream.in that CNN based component help to improve the compression efficiency. The bit stream recompression combines Pixel CNN with RNN to utilize the relation between wavelet transform coefficients.

These all paper show different compression techniques with different images for that we can develop an algorithm where any random image with any resolution or size, it could be compressed at a uniform rate without degrading the quality of images. Compress the house map with compression ratio without degrade the image quality.

III. DISCUSSION

This In this paper study the compression technique of map images. The digital map are stored and distributed using the image compression. The two types of image compression are used lossy compression and lossless compression. Compression is minimizing the size in byte of file without reducing the quality of images. The image file can be compressed in different ways. For internet use most common compressed image file format is JPEG and GIF format. The compression is done due to reduce the number of bits required to store the same image, lesser the number of bits per pixel lesser the space consumed to store the image. Several methods is used for compress the image, they depend upon their parameters like compression ratio, PSNR, delay, etc. In this paper discuss some method of compression. Compress the image with their parameter and improve compression ratio.

A. DWT and DCT

The DWT and DCT compression technique use for the JPEG and PNG images in that without degrading the quality of image result a good compression ratio. PSNR and MSE have been calculating the image compression related to the image. Image compression technique use encoding method for transform as image transform, parameter quantization,

encoding and DCT Based transform coding. Transform based compression is useful compression application[2].

(i) The wavelet transform is used to split the given function or continuous time signal into various wave signal. Quantization, entropy coding, DWT. The group of function by wavelets.

$$\psi_{a,b}(t) = \frac{1}{\sqrt{|a|}}\psi\left(\frac{t-b}{a}\right), \ a,b \in R, a \neq 0,$$

Where ψ is a function called wavelet, 'a' is another function which measure the degree of compression and b is a translation function which measure the time location of the wavelet.

(ii)DCT-based transform method used by JPEG image compression, it standard of the lossy compression method. DCT was efficient image compression method.

DWT hs higher compression ratio and DCT are lower than DWT ,in which DCT computing cost lower that DWT.higher flexibility of DWT function

B. Universal codebook construction and row column reduction coding

To compress the color map and grapg image use to method is universal code book construction and row column reduction coding, use 0.36 bps(bit per pixel) compression ratiowill begreater than the JPEG image

(i) universal code book construction : In this method entropy of image is high, the entropy is a uncertainty in a quantitative measure for a particular message, more information of image required higher entropy. it implies tht reduce the entropy of signal,the predctability of the next object given the preceding object increase.this method creating the codebook used a huffman tree codes. Binary image are codede with matrix form with block of 8×8 pixel.the frequency analysis on block is higher than 250000. Binary imags of white and black pixels dominantthe background and other section of the image. In normal to expect all-zeros and all-one 8×8 blocks to have the higher frequency of incident, form the shortest huffman code. From the sample identified a total 65,534 blocks ofthis selsct 6,952 blocks that occur 2 times or more than. form a large set of our codebook and calculated rest of the blocks[1].

The average huffman codeis used for construct the codbook with length of 4.094 bits per block. It is higher than entropy of 4.084 bits per block. To calcuate the frequency of all unique 8*8 blocks it take some days to complete the task, ituse Intel Dual Core Machine with 2.4GB of RAM.

(ii) Row Column Reduction Coding(RCRC)

For the compression use RCRC to handle the blocks and greater the compression ratio. It works on 8×8 block it create a row refrence vector,column reference vector and reduced block [1]. In this compress and decompress the image using RCRC.

C. Memorability Region

The memorability map point are used for the optimized image compression, in that memorability of object of image is negative connection of object count with the memorability of image, their existing a number of objects.

Using the memorability of image region which local region forms an object of image, it may be fail to remember using data driven approach that merge local image and global image features. Human memory is a long term memory, it stored memorable amount of visual data information and remembered numbers of picture even after seeing once. A novel framework was the predicting image memorability, in this memorability of image regions and various types of features disappear over time, offer the memorability region in maps. Doing the compression of originl image using memorabilty three factor are offer [12]

1. The model which based on the simulate the neglecting local image region
2. The memorability maps of individual image is automatically discover, that release which region are memorable.
3. It can improve the overall image memorability prediction.

Memorability uses the noisy memory procedure, encoding images which store in memory, image consists of various types of image region and feature. After delay in between previous and next image presentation, people are remembering some image regions and objects more than other. To represent Image region choose various features as attributes .in that consider some attributes (gradient, color, texture, shape, saliency and semantic) of images region. The attributes remove form the all region and assign to region.

Table :- compression method with their compression ratio

Sr. No.	Compression method	Compression ratio(%)
1	DCT	74
2	DWT	80
3	Universal code book	88.11
4	Row-Column Reduction Coding	73.44

IV. CONCLUSION

In this paper review on different compression method , study the compression technique and their parameter. DWT, DCT, memorability and others are compression method. From above analysis comparison of the other method show the greater performance with respect to the compression size and percentage of image. In this comparative study of different method with respective compression ratio.

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