Design an approach for Image Compression Using Encoding & DPCM

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ABSTRACT

In Today's data to day life information can be gather from different source like Text, Image, Audio, and Video & Animation. Every domain plays vital roles in information age. But we all know that time is very crucial these days. So, if we want to explore our work done by images may be give better result in many aspects. Since we are using Image as data source so that we apply concentration over Image processing techniques. Firstly, if we gather data from any source then we have to apply compression techniques so that our storage is used effectively in terms of cost and time. We all knows we have numbers of compression techniques available in open market. As a Researcher we have to apply or select best one in terms of their performance. We know that frequency play important roles in image. Here we are Implementing DPCM Techniques for Image compression. In Image processing we have to apply encoding techniques. We have number of encoding techniques available. Every technique having different working mathematical model. We implemented Huffman Techniques which gives better result in terms of CR, MSE & PSNR Values.

Keywords: Image Processing, Different Compression techniques. Encoding Techniques, Image performance measurement

I INTRODUCTION

The image can represent in 2-dimensional mathematical functionality which having some major characteristics like color, hue & many more.
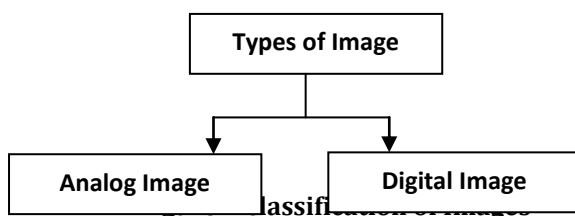
We all knows that in 21st century Text data or Image data play very important roles in many businesses. During doing any communication between Sources to Destination we use many protocols and different techniques so that we can use our medium in effective way.

We have many social networking web portals like Instagram where image play very important roles. In twitter and Facebook Images has vital roles in terms of Message passing. Since many platforms uses Images as image input component so we have to concentrate over this data.
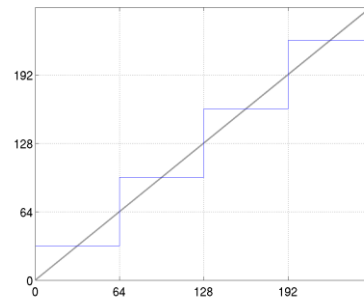
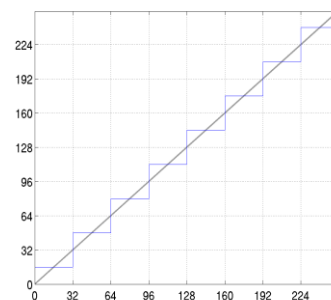

Figure 2: Level quantization Step 01

Figure 3: Level quantization Step 02

1.1 Digital Image

A digital image can be defined with mathematical equation. A digital image can be represented as below:

2

$$f = \begin{bmatrix} f(1,1)\,f(1,2)\ldots\ldots\ldots\ldots\ldots\ldots\ldots f(1,M) \\ f(2,1)\,f(2,2)\ldots\ldots\ldots\ldots\ldots\ldots\ldots f(2,M) \\ . \\ . \\ . \\ . \\ f(N,1)\,f(N,2)\ldots\ldots\ldots\ldots\ldots\ldots f(N,M) \end{bmatrix}$$

Figure 4: Image Depiction

II LITERATURE SURVEY

Here Authors explained the process utilized DPCM & LMS are using to reduce the unusual bit in given image during image compression. Here Quantization level used by Authors are 1 & 3. This can be easily seen or understand by histogram.

After applying LMS at every pixel we got reduced result by 2 unit. When we calculate estimation error after compression the error is less in comparison to previous one. When we compare on the basis of CR, we also got good results.

In this work Authors explore how the transmission channel errors affect the PSNR performance of the quantized sensing measurements and then increases the resistance of the transmitted data to the noisy channel.

Finally, they conclude that DPCM-based method in CS though can produce better rate-distortion performance compared to simple SQ-based CS, is more vulnerable to channel errors. Optimal energy allocation methods using both MSE and MAE criteria are proposed and the effect on CS image reconstruction is investigated.

In this work Authors Presented Here Authors Explained about ordered approach for near Lossless Image compression techniques. Here Authors Implemented DPCM techniques along with hierarchical mechanism. Authors Implemented dynamically optimization methods for better compression work done in this domain [11].

Finally, they concluded their compression values less by 10% in comparison to Previous implemented version.

III PROBLEM IDENTIFICATION

The Objective of this proposed work is to implement a robust technique that works for the images compression using Differential Pulse Code Modulation (DPCM) which can compress the data as much as possible. The hardware implementation and algorithm are also typical work. The early research in image compression introduced many techniques such as JPEG, JPEG-200, and JPEG-LS. In our implementation we will try that our algorithm is very simple so hardware implementation is easy in next step.

IV Block Diagram & Methodology
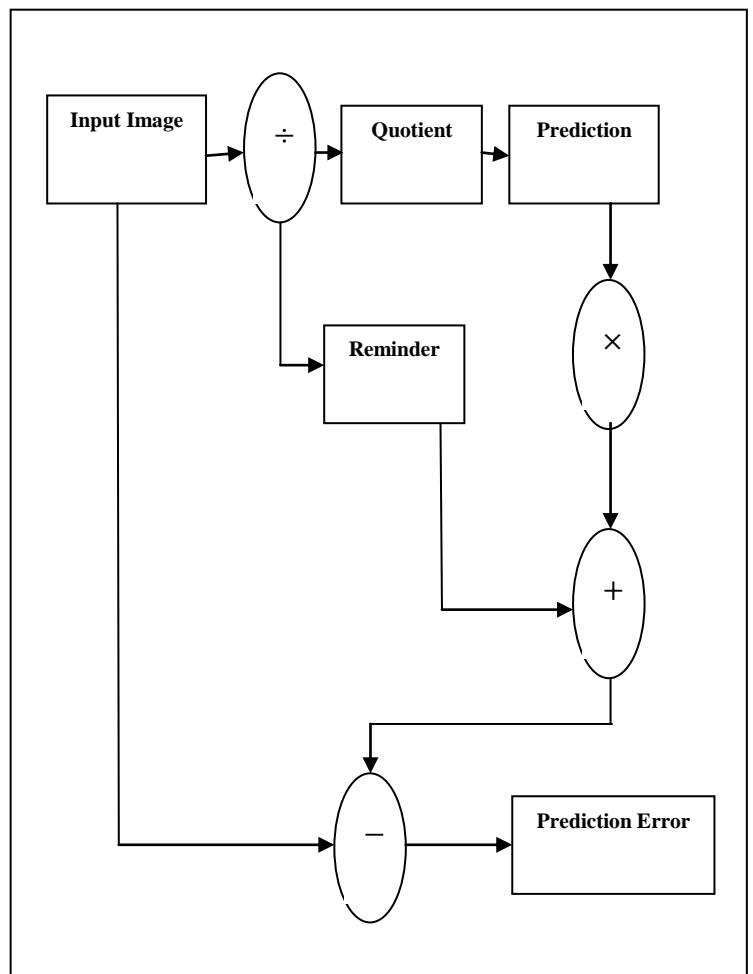
V Experimental Result

Image compression technique is very important part in Digital Image Processing. Here we are doing our job in four Phases:
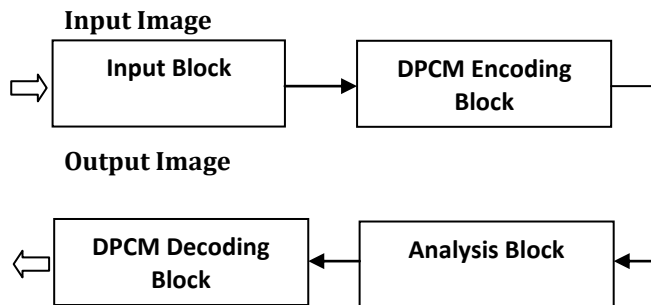

Figure 6: Process Diagram of Our Method

Description: In the above two figures we configure our tweeter API.
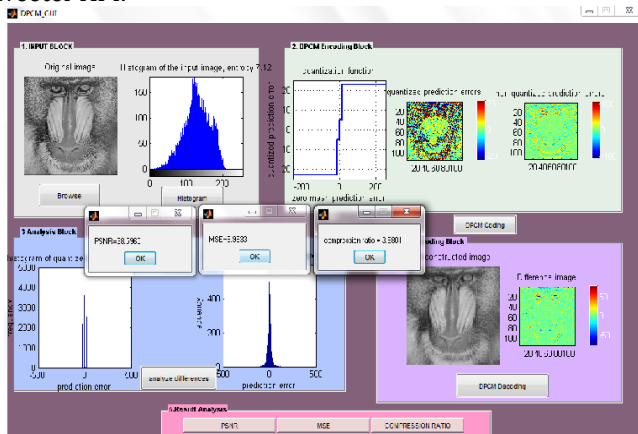

Figure 7: Baboon Image as Input

In above fig 7 we analyse the overall result for image Baboon. Here we have 4 blocks each block having different working behaviour.

VI CONCLUSION

Here Author concluded that a new method of compression which is based on EDT and Huffman entropy encoding. Comparison was based upon Different parameter like MSE, CR & PSNR values. Here we found that our proposed methods give better result in comparison of previous implemented mechanism by other Authors.

VII FUTURE SCOPE

In near future we all knows that neural network plays vital roles in Image processing. We will try to implement this project with the help of neural networks and Deep Learning. In case of huge data set it will work in better ways. In today's scenario a data generated in a huge amount which we have to process in effective manner so that we store it in a huge data in a less memory.

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