Enhancement of Gray Color Image using Limited Histogram Equalization Technique

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Abstract:- Image enhancement plays asignificant role in multimedia and image processing applications. Many images writhe from poor dissimilarity and noise due to the insufficient lighting during image obtaining. So it is required to enhance the contrast of image as well as remove the noise that reductions image quality. The objective of enhancement is to improve the fundamental appearance of an image without any degradation in the input image. The main goal of this paper is to give a simple implementation of histogram equalization algorithm of a color image in efficient manner.

Keywords: *Image Enhancement, Histogram Equalization.*

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1. INTRODUCTION

Image enhancement is among the simplest and greatestexciting areas of digital image processing. Image enhancement is a technique that is used to enhance the difference of the image which has been lost at the time of gaining[1]. Image enhancement can be used in many fields are to be explored such as satellite images analysis, forensic images, medical images, remote sensing images and general images. Improvement in quality of these corrupted images can be achieved by using application of enhancement techniques.The important features of image enhancement techniques are the reduction of noise, blurriness, increase the contrast of the image and enlightening the particulars[2].Image enhancement can be classified into two groups namely frequency and spatial domain methods. In the frequency domain way, the enhancement is directed by adjusting the frequency transform of the image. Another method, the image pixels are directly reformed to enhance the image. Frequency domain is time consuming process and fast while compare to the spatial method. Histogram equalization is a modest and commonly used image contrast enhancement technique better in performance on almost all typed of images [3]. Histogram equalization is the process to shots to allocated more number of gray intensities to the frequency appeared gray levels.

This paper is organized as follows, Section II describe literature survey, Section III represent Image enhancement techniques, Section IV Histogram equalization, SectionV Proposed methodology, and Section VI deals the Simulation results and Section VII Conclusion.

2. LITERATURE SURVEY

Image enhancement is basic idea smeared in image processing that improve the accuracy and appearance of the image [4]. There is huge number of techniques available up to date to enhance images like contrast enhancement, hue, Intensity, and saturation transformations, Edge enhancement ,Compactness slicing, making digital varieties, producing synthetic stereo images, BBHE, local Histogram equalization etc. to give a proper results[5]. Histogram equalization is a meek and broadly used image contrast enhancement technique. Histogram Equalization is an extremely well known approach for improving contrast of a picture. Its fundamental thought deceits on mapping the dark levels in view of the chance circulation of the data dim stages [6].

3. IMAGE ENHANCEMENT TECHNIQUES

Image enhancement can be used in many fields where images are to be analyzed such as satellites, medical, forensic, forest, deep sea,mining, and non-accessible area image analysis etc.It can be defined the Image enhancement technique as transforming an image P into image Q using transformation function S. The values of pixels in images P and Q are denoted by p and q, respectively. As said, the pixel values p and q are related by the expression, $q = S(p)$ .Where S is a transformation algorithm that converts a pixel value p into a pixel value q.

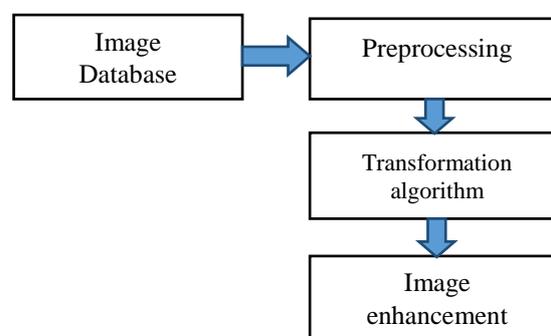The results of this transformation are converted into the color range togrey scale image.

Fig 1.Block diagram of Image enhancement

The block diagram shows the image enhancement technique. The image database provide the low quality

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image to the preprocessing block want to enhance. Further the selected poor image is converted to the distinct layer image. After the conversion to the image next to it is the preprocessing so that the enhancement process will be more efficient and resulted image will be improved. After performing the preprocessing process, applying the efficient transformation techniques to earn the high quality of image. After applying the histogram equalization technique the high quality of image will retrieve.

Few enhancement techniques are to be described below for color and gray scale images:

1. Histogram equalization
2. Brightness preserving bi-histogram equalization
3. Brightness preserving dynamic histogram equalization
4. Dynamic histogram equalization
5. Adaptive histogram equalization
6. Adaptive DWT based Dynamic Stochastic resonance
7. Plateau Histogram equalization.
8. Contrast limited adaptive histogram equalization
9. Contrast enhancement
10. Dynamic Histogram Specification
11. Minimum mean brightness error Bi histogram equalization
12. Dualistic sub image histogram equalization
13. Recursive mean separate histogram equalization

4. HISTOGRAM EQUALIZATION

This is one of the most simple and standard methods used for image enhancement. By means of histogram to decide that given image is whether a dim image or dainty image or low or high contrast image. Histogram of an image is concerned with the gray levels. This technique will gives the high quality image with efficiency as well as exactness. Histogram equalization types can be classified in two categories, namely Global and Local Histogram Equalization. The histogram of an image is a plot of the gray levels values versus the number of pixels at that value. Probability density function defined as:

$P(A_k) = t_k / s$, Where A_k is the given image and K varies from 0 to $M-1$, t_k represents the number of times that the level A_k appears in the input image A. s is the total number of samples.

5. PROPOSED METHODOLOGY

In proposed method, by apply Histogram equalization method for contrast enhancement for color images to recover and improve the quality of the degraded image from the poor image data input.Following is the methodology of the work proposed. The following steps are involved.

Step-1:Read a image from the database

Step-2:State the range of image color
Step-3:Catch the histogram of the image
Step-4:Divide the result by number of image pixels
Step-5:Estimate the collective sum of pixel values
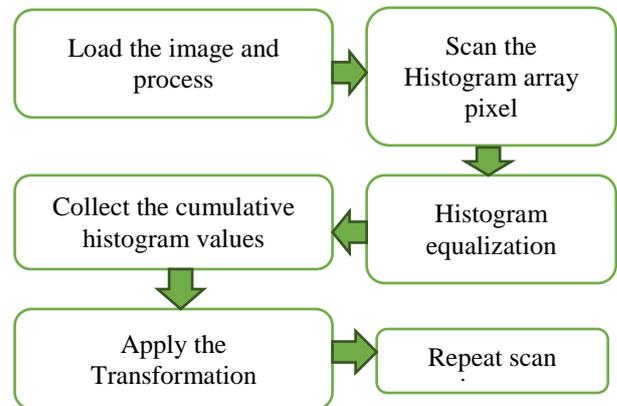Step-6:Apply the conversion and convert the image to number as integer.

Fig.2. Block diagram of proposed method of Histogram Equailazation
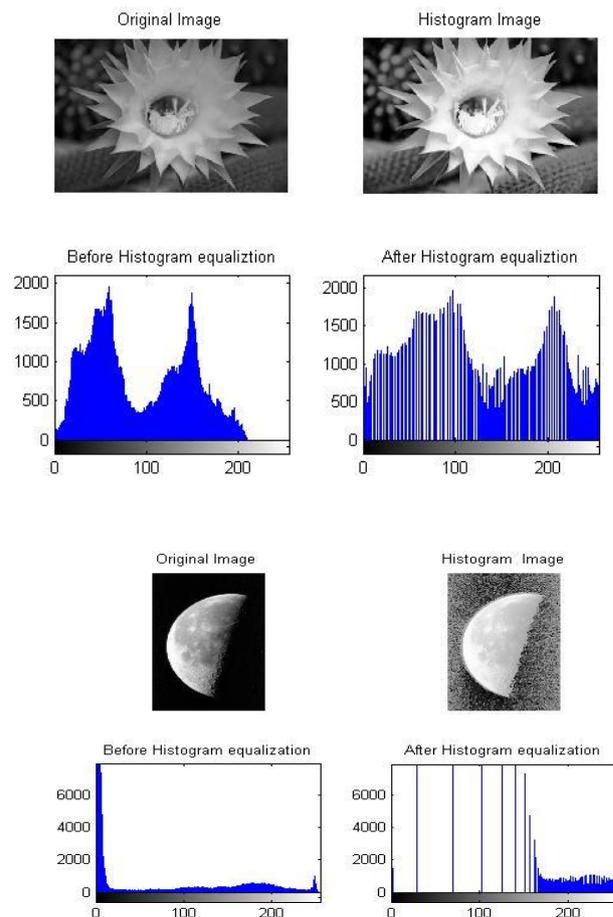
6. RESULTS AND DISCUSSION

Fig.3.Simulation Results of Original and Histogram EquailizationImages

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7. CONCLUSION

This paper emphasized contrast enhancement of natural gray scale images. Histogram equalization is dominant method for image enhancement and it will escalation the contrast of image. The output of the proposed technique showed that improved image quality and enhanced structural appearance of an image. The enriched image will give the packed dynamic collection of histogram.

References

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