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REVIEW ON IMPROVING VISUAL PRESENTATION BASED ON IMAGE HISTOGRAM EQUALIZATION TECHNIQUE

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Abstract— *Image improvement is one in every of the tough issues in low level image method. Image improvement completely different methods like bar graph equalization, multipoint bar graph equalizations and movie part dependent distinction protecting, but of this system are not up to marks. projected technique a picture reciprocity linear perception network technique for image improvement that contains a lot of sturdy result for distinction improvement with brightness preservation. Image part reciprocity linear perception network supported curve let transform and perceptron network. Curve let transform image remodel into multi-resolution mode. it's a realize part distinction of component for the dependency of characteristic and matrix work as a weight vector for perception network and thus the perceptron network is in work to vary the load of input image or values. Image mutuality linear perceptron network for distinction improvement has applied on several photos and compared the results of our projected methodology with various image improvement methods like bar graph equalization. Absolute mean brightness error is used to measure the degree of brightness preservation. Smaller AMBE is best and Peak signal to noise quantitative relation (PSNR) is employed to measure the degree of distinction improvement, larger PSNR is best. By examination image secure encryption improvement technique exploitation bar graph equalization with supported the AMBE and PSNR. Image secure cryptography improvement have found that projected technique (PIILPNM) is best than existing technique (HE).*

Keywords: Contrast enhancement, Visual Presentation, Histogram, Histogram equalization, brightness preserving, AMBE, PSNR.

I.INTRODUCTION

Contrast improvement is one of the foremost important phenomena which can improve the visual quality of an image. Everyday people capture big size of images, and these photos may demand improvement due to the existence of noise, cloud, quality of the image capturing devices, etc. Digital image method might be a broad subject and generally involves procedures which can be mathematically advanced, but central set up behind digital image method is quite simple. the ultimate word aim of image method is to use info contained at intervals the image to vary the system to understand, recognize and interpret the processed information out there from the image pattern [1]. Image improvement techniques improve the quality of an image as perceived by human. usually image improvement techniques are accustomed get detail that is obscured, or to specialize in sure choices of interest in image. In image improvement methodology one or extra attributes of image are modified. Image improvement is applied to wholly completely different areas of science and engineering. other than illumination conditions, quality of images is in addition affected by external noises and environmental disturbances like shut pressure and temperature fluctuations. Thus, image improvement is very important. Approaches of distinction restricted image improvement via stretching the bar charts over a reasonable dynamic vary and multi-scale adjective histogram equalizations is developed. an adjective formula is customized to the image intensity distribution either globally or regionally. By separating swish and detail areas of an image, the formula is applied to each of them to avoid excessive sweetening of noises. In most cases, quality of images is affected by atmosphere medium and water medium, therefore image improvement is required [2]. The aim of image improvement is to enhance the interpretability or perception of knowledge in image for human viewers, or to supply `better' input for alternative automatic image process techniques. pictures will be processed by completely different suggests that, however image process victimization digital computers are that the commonest methodology as a result of digital strategies are quick, flexible, and precise. Image improvement improves the standard of pictures for perception. In an application specific image improvement technique the system is taught for the particular procedures to get a much better output image as shown by the diagram of Figure one.1.

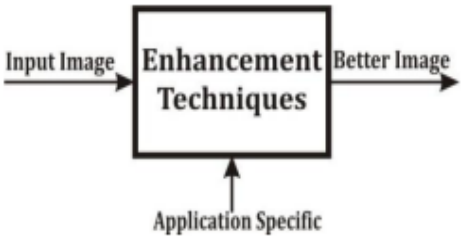

Fig1 Application specific image enhancement

Typical image enhancement operations are removing blur and noise, increasing contrast and revealing details

1. Contrast (i)Enhancement: Image Contrast is the difference in appearance of two or more parts of an image seen simultaneously. Contrast enhancement is used to increase the visual perception of difference between different parts of an image. A number of algorithms for contrast enhancement are currently in use throughout the world. The methods of brightness contrast and color contrast has been discussed here. An image must have good brightness contrast for proper vision. In a low contrast image, we can't distinguish clearly between objects. Increasing the contrast makes the light areas become lighter and dark areas become darker. Three methods are used to auto-correct the contrast of image. First method uses linear stretching of histogram over the entire range. This technique maps the intensities to new values such that the data is stretched to the whole range.

2. Removing Noise: Digital images are prone to a variety of types of noise. Noise is the result of errors in the image

acquisition process that result in pixel values that do not reflect the true intensities of the real scene. Noise can be introduced into digital images due to several reasons such as a) If the image is scanned from a photograph, the film grain is a source of noise. It can be a result of a damaged film or due to the scanner itself. b) If the image is captured directly from a digital camera it can be due to mechanism of gathering the data. c) It can also be introduced due to less light or high shutter speed of digital camera's) Electronic transmission of image data can also introduce noise. Linear Filtering is easiest method to remove certain type of noise. Averaging or Gaussian filter can be used to accomplish this job. Averaging filter is useful to remove grain noise. Each pixel gets set to the average of its neighboring pixels. The problem with averaging filter is that edges of image get blurred. Median filter works in a similar way as averaging filter, the only difference is the output value of a pixel is determined by the median of the neighboring pixel rather than mean. The principle advantage of median filtering over averaging is that it is much less sensitive to extreme values. Therefore, median filtering is better able to remove noise without blurring the edges. Adaptive filtering using Wiener filter often produce much better results than linear filtering. Adaptive filter preserves edges and other high frequency information of an image so it is more selective then linear or median filters. This filter produces best output when noise is AWGN.

3. Blur Reduction: When we use a camera, we want the recorded image to be a faithful representation of the scene that we see but every image is more or less blurry. When an image does not show sharp details of its features it is called blurred image. Thus, image deblurring is fundamental in making pictures sharp and useful. Some blurring always arises in the recording of a digital image; because it is unavoidable that scene information "spills over" to neighboring pixels. In image deblurring, we seek to recover the original, sharp image by using a mathematical model of the blurring process. Unfortunately there is no hope that we can recover the original image exactly! This is due to various unavoidable errors in the recorded image. The most important errors are fluctuations in the recording process and approximation errors when representing the image with a limited number of digits.

Histogram Image Improvement Applications: Image improvement has contributed to analysis advancement during a form of fields. a number of the areas during which that is has wide application are noted below. pictures are wide utilized in several analysis areas like atmospherically sciences, astrophotography, satellite, bioscience and machine learning wherever pictures also are suffered from poor distinction attributable to the existence of noise. Therefore, it's necessary to reinforce the distinction of the image while not acquisition artifacts [6].

1. A popular tool for real-time processing: Histograms are simple to calculate in software and also lend themselves to economic hardware implementations
2. in forensics, that is employed for identification, proof gathering and police work. Pictures obtained from fingerprint detection, security videos analysis and crime scene investigations are increased to assist in identification of culprits and protection of victims.
3. Histograms are used to analyze image: We can predict the properties of an image just by looking at the details of the histogram.
4. In atmospherically sciences, that is used to reduce the results of haze, fog, mist and turbulent weather for meteoric observations. It helps in police investigation form and structure of remote objects in setting sensing. Satellite pictures endure image restoration and improvement to get rid of noise.

II. LITERATURE SURVEY

The section describes about previous related work under image processing .

W. Kang et al. [7]. proposed the method which uses dominant brightness level of Image for decomposing the Image in different three layers and then these layers are used for appraisal of adaptive intensity transfer function. This predictable adaptive intensity transfer function is used for image contrast enhancement subsequently these layers are fused to get enhanced image,

Reddy et al. [8]. Proposed an algorithm in which it first performs the DWT to decompose the input image into a set of band-limited components, called HH, HL, LH, and LL sub bands. Since the LL sub band has the illumination information, the log-average luminance is calculated in the LL sub band for computing the dominant brightness level of the input image The LL sub band is divided into three low, middle, and high concentration layers according to the principal intensity level. The adaptive intensity transfer function is deliberated in three partitioned layers by the foremost intensity level, the knee transfer function, and the gamma alteration function. Subsequently, the adaptive transfer function is concerned for colour preserving high quality contrast enhancement. The resultant enhanced image is obtained by the inverse DWT (IDWT).

Huang et al. [9] .Besides these HE based image enhancement techniques, some other techniques have been already proposed. AGCWD is proposed by where gamma correction and luminance pixels probability distribution have been used. Although most of the cases AGCWD enhance the brightness of the input image, it might not give satisfactory results if the input image has lack of too bright pixels. Because in this case, the highest possible enhancement never crosses the maximum intensity of the input image which can be easily understandable.

Chang et al.[10]. developed a fuzzy based approach to contrast enhancement of the remote sensing image data to partition the image pixel values into dissimilar degrees of associates in order to reimburse the local brightness lost in the dark and bright areas. The algorithm includes three steps: primarily, the satellite image is distorted from gray-level space to membership space by Fuzzy c- Means clustering. Secondly, suitable stretch model of each cluster is constructed based on corresponding memberships. Third, the image is

changed back to the gray-level space by merging stretched gray values of each cluster

Chen Q. et al.[11] .To mitigate the problems faced in BBHE, Wan et al. propose another modified HE named as DSIHE . Here, the histogram is separated in two sub-images based on the median instead of the mean and equalized similar to BBHE. Although DSIHE does not allow significant mean shift, it fails to preserve mean brightness in some cases. Besides this, DSIHE may also create artifacts or fail to enhance to some extent. For example, the image pixel intensities are 1, 2, 3, 200, 205, 208 and 210. Here, the median is 200, as a result the first three pixels can be over-enhanced which is not desired.

Pandey D K et al. [12]. proposed a method to improve the quality of image using Kernel Padding and DWT with Image Fusion that enhances the contrast of Images that has varying intensity distribution particularly satellite images, maintain the brightness of images, sharpens the edges and abolish the blurriness of images. Fundamentally this is a pixel-based edge guided image fusion technique. In this technique LL sub band of Image DWT is processed by contrast enhancement section where based on image brightness level image is decomposed in different layers and then every layers intensity is stressed or compressed by generating intensity transformation function. The partitioned intensity layers are also processed by canny edge detection method as all the satellite images includes the noise due to atmospheric turbulence and this is Gaussian by nature. The Canny edge detector is the best method for detecting edges of image in the existence of Gaussian noise. At last the contrast enhanced images are fused according to the weight map determined by edge map of image.

Cagri Ozcinar et al.[13] proposed a new method for enhancement of satellite images contrast. Their method was based on Discrete Wavelet Transform (DWT) and singular-value decomposition. They first applied DWT to input image to divide it into four frequency sub-bands, then used singular value decomposition and then again applied inverse DWT to reconstruct the image. This technique showed enhanced results than conventional Brightness preserving Dynamic Histogram Equalization (BPDHE) method and other methods.

Qiuqi Ruan et al. [14]. presented a robust inverse diffusion equation method which sharpens image details by a robust Laplacian after demonstrating the equivalence of the sharpening by the Laplacian to inverse heat equation processing. Image gradient magnitude is used to avoid the noise magnification. At the same time, the min-mod function is used to manage diffusion flux adaptively, which reduces effectively overshoots inherent in the Laplacian. The Experimental results demonstrate that this algorithm can enhance important details of image data effectively exclusive of overshoots, giving the opportunity for a good interpretation and subsequent processing.

Kim et al [15]. Propose RSWHE which is another improved version of HE. RSWHE consists of three modules such as histogram segmentation, histogram weighting and histogram equalization. In histogram segmentation module, multiple sub histograms are generated based on the image mean and median. Meanwhile, in histogram weighting module, separated histograms are weighted by normalized power law function. This module provides more probabilities to infrequent gray levels. Finally, HE is applied on each of the weighted histogram. However, some statistical information might lose after performing histogram transformation and the desired enhancement may not be achieved.

III EXPECT OUTCOME

In survey find the problem in adaptive histogram equalization are not improving visual presentation of based on image histogram equalization technique so our proposed method finds improving visual presentation of image then clear view of image

IV. CONCLUSION

In study of the image improve visual In image security improvement field numerous techniques existing adaptive bar graph equalization have planned to enhance the standard of image like bar graph equalization, multi-histogram equalization and component dependent image security conserving. Image mutuality linear perceptron network technique (PIILPNM) for image improvement that gives a far better result for distinction improvement with brightness preservation. PIILPNM uses the curve let and perceptron network for image improvement. The curvelet transform is employed to transform a picture into multi-resolution mode and perceptron network is employed to regulate the load of input image or values. Our planned technique for image security improvement has applied on many pictures and compared the results of our technique with alternative image security improvement strategies. planned technique verify parameters particularly AMBE and PSNR, the planned technique is compared with the existing strategies particularly HE. Mathematically proved that the planned technique is best than alternative image security improvement strategies.

REFERENCES

[1]. S. Rahman, M. M. Rahman, K. Hussain, S. M. Khaled, and M. Shoyaib, “Image enhancement in spatial domain: A comprehensive study,” in Computer and Information Technology (ICCIT), 2014 17th Intl. Conf. on. IEEE, 2014, pp. 368–373.

[2]. S.S. Bedi, Rati Khandelwal “Various Image Enhancement Techniques- A Critical Review” International Journal of Advanced Research in Computer and Communication Engineering Vol. 2, Issue 3, March 2013.

[3]. Sapana S. Bagade, Vijaya K. Shandilya, “Use of Histogram Equalization In Image Processing For Image Enhancement”, International Journal of Software Engineering Research & Practices Vol.1, Issue 2, April, 2011.

[4]. Anisotropic diffusion presented by Perona and Malik in 1987.

[5]. Deblurring Images: Matrices, Spectra, and Filtering, written by “Per Christian Hansen, James G. Nagy, and Dianne P. O’Leary”, Published by “Siam”

[6]. M. M. Rahman, S. Rahman, E. K. Dey, and M. Shoyaib, “A gender recognition approach with an embedded preprocessing,” International Journal of Information Technology and Computer Science (IJITCS), vol. 7, no. 7, p. 19, 2015.

[7]. Eunsung Lee, S.Kim, W.Kang, D.Seo and Jooki Paik "Contrast Enhancement using Domonant Brightness Level and Adaptive Intensity Transformation for Remote Sensing Image" IEEE Geoscience and Remote sensing letters, Vol. 10, no.1, January 2013
[8]. G. Veena, V. Uma, Ch. Ganapathy Reddy "Contrast Enhancement for Remote Sensing Images with Discrete Wavelet Transform", International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-2, Issue-3, July 2013
[9]. S.-C. Huang, F.C. Cheng, and Y.-S. Chiu, "Efficient contrast enhancement using adaptive gamma correction with weighting distribution," Image Processing, IEEE Trans. on, vol. 22, no. 3, pp. 1032–1041, 2013.
[10]. Chi-Farn Chen, Hung-Yu Chang, Li-Yu Chang "A Fuzzy-Based Method For Remote Sensing Image Contrast Enhancement" The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences. Vol. XXXVII. Part B2. Beijing 2008
[11]. Y. Wang, Q. Chen, and B. Zhang, "Image enhancement based on equal area dualistic sub-image histogram equalization method," Consumer Electronics, IEEE Trans. on, vol. 45, no. 1, pp. 68–75, 1999.
[12]. Deepak Kumar Pandey, Rajesh Nema "Efficient Contrast Enhancement using Kernel Padding and DWT with Image Fusion" International Journal of Computer Applications (0975 – 8887) Volume 77– No.15, September 2013.
[13]. Hasan Demirel, Cagri Ozcinar, and Gholamreza Anbarjafari," Satellite Image Contrast Enhancement Using Discrete Wavelet Transform and Singular Value Decomposition", IEEE Geoscience and Remote Sensing Letters, vol. 7, no. 2, pp. 333-337, April 2010.
[14]. Shujun Fu, Qiuqi Ruan, Wenqia Wang "Remote Sensing Image Data Enhancement Based on Robust Inverse Diffusion Equation for Agriculture Applications" ICSP 2008 Proceedings.
[15]. M. Kim and M. G. Chung, "Recursively separated and weighted histogram equalization for brightness preservation and contrast enhancement," Consumer Electronics, IEEE Trans. on, vol. 54, no. 3, pp. 1389–1397, 2008.