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Implementation of adaptive image contrast enhancement technique for Image Processing Applications

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Abstract
An automatic and objective assessment of image quality is important in processing of imaging data. To magnify the consumed medicine for simpler X-ray interpretation Digital Image Processing Techniques can be used. In this paper, the Implementation of adaptive image contrast enhancement technique for image processing applications is done. The main objective of the project is to produce image processing algorithm which can enhance the contrast information efficiently. The adaptive technique of selection for contrast has become effective in image processing applications. However, many of the imaging parameters are weighted towards late stage that allow detection such as passive contrast improvement across a compromised areas.

Keywords: Contrast enhancement, Histogram equalization, image processing

Introduction
In various areas, for example medical images, industrial and satellite image processing applications, Image processing is an extensive and demanding field. In our senses, the most advanced sense is Vision; the image plays an important role in human life. In Medicine to improve contrast for easier interpretation of X-rays and other bio-medical images [1], digital image processing Techniques can be used. Image processing is secure test that can uses a magnetic field and radio waves to generate in depth images of the brain, brain stem and it is effortless test. Then, we can start the treatment of brain tumors, swelling and bleeding by using of the enhanced image. This enhanced image produces high-resolution images and having the complete Information about the brain functionality, observes the brain maturity and abnormalities.

For human perception an image feature should be developed, for this the Image Improvement technique is used. It is defined as an image processing method, the result is much more appropriate than the original image [2]. Histogram Equalization is fundamental to use for image enhancement. It is probable to help with the perception of how the digital images work. The technique of equalization intensity level is an image with enhanced dynamic range, which tends to be highly contrasted, due to the significant distribution of the histogram throughout the intensity scale. Overall, the increase intensity is due to the reality that in the histogram of the equalized picture the average intensity level is better than the original. Its role is to raise the intensity dynamic range in an image.

Enhancement is the process of alteration and corrects impact of observer. Image conditioning can be passed through pre-processing techniques, called as image enhancement. These methods are used to create the excellence of the picture, appearance of human perception. For a particular implementation, the processed picture is more appropriate than the initial picture [3-4]. For image contrast improvement histogram equalization (HE) can be used. Because of its simplicity and slightly better image quality, most of the technique is used to generate detailed images of the brain and brain stem. A magnetic field, radio waves are used by image processing to generate detailed image of the brain and brain stem.

Image processing machines have better openings and supportive for patients with claustrophobia. To estimate persistent headaches, dizziness, weakness, and blurry vision or seizures image processing of the brain is helpful, and it can help to notice certain chronic diseases such as multiple sclerosis [5] of the nervous system.

In imaging science, picture preparing is handling of pictures utilizing scientific tasks by utilizing any type of sign preparing for which the info is a picture, for example, a photo or video

outline; the yield of picture handling might be either a picture or a lot of qualities or parameters identified with the picture. Most picture preparing systems include regarding the picture as a two-dimensional signal and applying standard sign handling strategies to it Picture handling ordinarily alludes to computerized picture preparing, however optical and simple picture preparing likewise are conceivable.

This article is about general systems that apply to every one of them. The obtaining of pictures alluded to as imaging. Picture improvement alludes to highlight, or honing of picture highlights, for example, edges, limits, or complexity to make a realistic showcase progressively helpful for show and investigation. The upgrade procedure doesn't expand the innate data content in the information. In any case, it increases the dynamic scope of the picked highlights with the goal that they can be distinguished effectively.

Picture upgrade is utilized to improve the nature of a picture for visual impression of people. It is likewise utilized for low level vision applications. Picture improvement is the system to process the info picture to make it progressively suitable and plainly noticeable for the necessary application. Picture upgrade improves the data substance of the picture and adjusts the visual effect of the picture on the spectator. The target of picture improvement is to change credits of a picture to make it increasingly appropriate for a particular errand. In the picture upgrade procedure, at least one qualities of the picture are changed and prepared. The selection of traits and the manner in which they will be changed are explicit to a given assignment. Upgrade is pre-handling step in some PC vision applications to facilitate the vision task, for instance to improve the edges of an article to encourage direction of automated gripper. Improvement is additionally utilized as pre-handling step in applications where human survey of a picture is required before further preparing. Picture improvement is utilized for post handling produce an alluring picture

2. Literature Survey

The image segmentation technique was suggested by Havel Muhammad and David, *et al*. This technique of segmentation finds a contour that splits the image into images that are non-overlapping. This method of segmentation refers to homogeneous images of intensity. The benefit of this method is without any extra term, it is automatically proceeds in the right direction. This algorithm works on various regions of disjunction. The computational cost of solving the estimated PDEs is very high and the contour C is not known it is difficult to minimize the function.

D. Selvaraj and R. Dhanasekaran suggested a new approach to brain MRI segmentation. This method is based on thresholding based on intensity to obtain ordinary brain tissue limits such as CSF, GM, and WM. This strategy consists of two pre-processing phases and the other is segmentation. Skull removal is the first phase of pre-processing brain tissue segmentation. In the second step, we apply the polynomial orthogonal transformation to the image stripped from the skull and segment the CSF from the image of the brain MRI. For GM and WM segmentation, the skull stripped picture is first smoothed by applying Gaussian convolution filter and then calculating the smoothed image's x, y gradients. Using these gradient values, the edges in the picture were labeled and then binarization and morphological operators were performed to remove the noise from the picture. This technique is easiest and fastest, but the issue is that medical images are pre-processed and pre-registered.

The expansion of the Mumford Shah function was suggested by Andy Tsai and Anthony Yezzi *et al*. This method covers the issue of missing data owing to the Infrared Sensor's saturated intensity and defective pixels. This algorithm fills the gaps with the assistance of the previous smoothness constraint. This technique conducts images with missing information segmentation, denoising and interpolation. Several methods in this article have made our algorithm quick, effective and handle significant image features like triple point and various intersections.

Lee *et al*. suggested a computer tomography (CT) brain image segmentation technique. This method is divided into two types pre-processing and segmentation components. Pre-processing: First of all, we do improve the contrast of initial image in pre-processing. The next stage is to extract the image context and skull and remove the intracranial area. Reduce the partial volume impact on the intracranial boundary by using the canny algorithm and disconnect the ordinary region after removing the edge from the abnormal region and enhance the contrast of the abnormal region. Salt and pepper noise are removed by using median filter.

Segmentation: This chapter introduces the methods of segmentation applied to the improved abnormal picture. There are many methods of segmentation such as Otsu threshold, K-means, Expectation Maximization (EM) technique, and Fuzzy c-means (FCM) with autonomous population-diameter (PDI).

The best way to segment CT head images is to use the FCM with PDI method. Compared to the FCM with PDI, the results after the EM segmentation is very loud. The FCM accurately balances the contribution of small and large clusters with PDI. Chunming Li et.al suggested a formulation method based on region-based variation rate. The entire picture is segmented by this algorithm. It overcomes the issue of homogeneity intensity. In this method we first identify the energy function of Region Scalable Fitting (RSF) and then two fitting functions f1 and f2 perform localization. This algorithm can segment objects that are inhomogeneous. The descent technique of gradient is used for minimizing the functional energy

3. Proposed System

The below figure (1) shows the block diagram of proposed system. In this histogram processing, Gaussian filter, adaptive image contrast enhancement processes are performed. Here an image is enhanced depend on the pixel value. To get effective results the image is enhanced by using the interdependency network. Gaussian filter uses the linear perception network in the proposed image. The entire system depends on the three steps which are performed internally. They are filtering, transformation and perception network. For filtering procedure mainly Gaussian filter is used.

This Gaussian filter will produce a row image by using input image. Now the signal is converted based on the transformation technique. There will be no loss of information while transforming. The weight of input image is maintained by the perceptron network. The weight of input image is varied from 0 to 1.

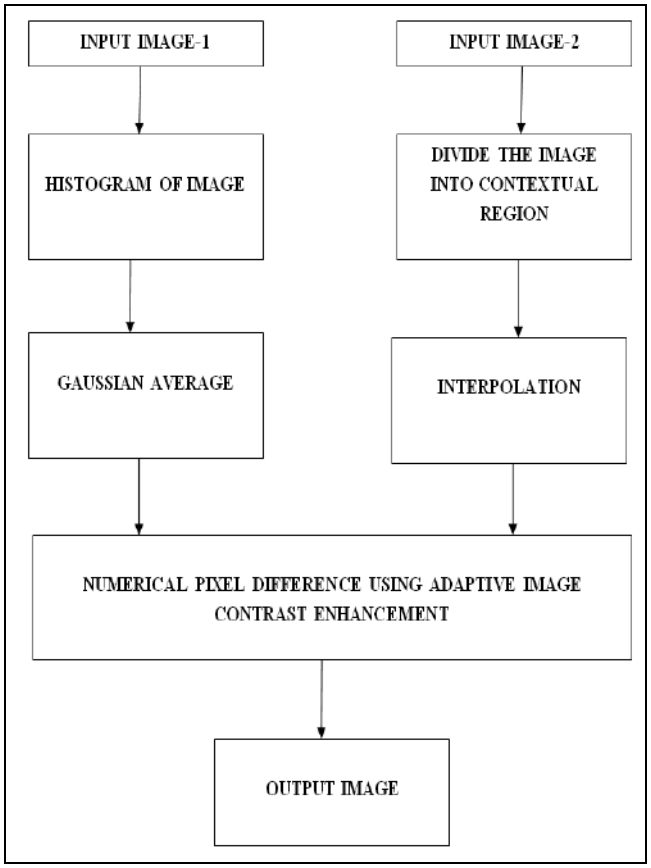

Fig 1: Proposed System

At first an input image-1 & input image-2 are passed through their related blocks. Here the input image is given to histogram block. The main intent of histogram is to improve the contrast of image. In the same way, the input image-2 is given to the corresponding block which will divide the image in the regions of conceptual. Now, for imahe-1, Gaussian filtering process is performed to get an row image. Next, the image-2 will interpolate the obtained image. Basically, to reduce the noise that is occurred in the input image and row image, mainly pre-processing step that is Gaussian image filtering is performed. The Gaussian filtering concept is obtained from the theory of probability.
Picture change is done in numerous means that are as per the following. (A) Row picture is changed over in a network structure by utilizing the bend let change that is a multi-directional change. (B) Calculate the mean estimation of network and the mean worth are utilized as limit esteem. Recognition system Calculate the pixel contrast by utilizing slope nice technique. The slope nice depends on minimization of mistake E characterized as far as weight and initiation capacity of system. Contrast the pixel distinction and mean worth .If pixel distinction is more prominent than mean vale at that point, pixel distinction worth is chosen for weight grid generally is dismissed.

4. Results

Fig 2: Input Image

Fig 3: Histogram Processed Image

Fig 4: Proposed Method Using Weighted Contrast Enhancement

Fig 5: Proposed method using absolute contrast enhancement

5. Conclusion

The implementation of image contrast enhancement of image processing applications is introduced in this paper. This proposed system will detect the corrupted images in the large scale data base. Effective contrast enhancement is obtained by using the proposed system. Firstly, the pre processing stage in this system will remove the noise in the image. From the results, it can observe that efficient precision is obtained in the system based on the methods of volumetric.

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