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Research Paper Engineering

IMAGE ENHANCEMENT ON DIFFERENT LIGHTING CONDITIONS USING COLOR AND DEPTH IMAGE

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ABSTRACT *In this paper we introduce a new global contrast enhancement algorithm utilizing the histograms of colour and depth pictures. On the premise of the histogram-modification system, the shading and profundity picture histograms are first separating into subintervals utilizing the Gaussian mixture model. The positions apportioning the colour histograms are adjusted to spatially neighbouring pixels with the same power intensity and depth values can be assembled into the same sub-interval. By evaluating the mapping bend of the contrast improvement for each sub-interval, using this model global contrast enhancement can be enhanced without over improvement in the local image contrast. Test results exhibits the adequacy of the proposed calculations.*

KEYWORDS : Contrast enhancement, depth image, histogram evaluation, histogram division.

I.INTRODUCTION

Histogram processing is the demonstration of modifying a picture by altering its histogram. Regular employments of histogram handling incorporate standardization by which one makes the histogram of a picture as level as could be allowed. In PC design, the procedure of enhancing the nature of a digitally put away picture by controlling the picture with programming. The point of picture improvement is to enhance the interpretability or impression of data in pictures for human viewers, or to give `better' information for other computerized picture preparing systems. An exceptionally well known strategy for difference upgrade of pictures is Histogram Equalization HE

1. Image enhancement.
2. Image restoration.
3. Image-compression etc.

The rest of the paper is organized as follows. In Section II, histogram Equalization for image contrast enhancement algorithm Proposed algorithm steps Explained in Section III, Experimental results are presented in Section IV, followed by the conclusion in Section V.

LITERATURE SURVEY

In this structure, contrast upgrade is acted like an advancement issue that minimizes an expense capacity. Histogram adjustment is a powerful system for difference upgrade. Be that as it may, customary histogram balance (HE) generally brings about unnecessary differentiation improvement, which thusly gives the transformed picture an unnatural look and makes visual ancient rarities.

Henceforth, the differentiation of the picture/feature can be enhanced without presenting visual ancient rarities that lessening the visual nature of a picture and reason it to have an unnatural look [1] and [2].

Advantages

A low-multifaceted nature calculation for complexity upgrade is exhibited, and its execution is shown against an as of late proposed technique. Contrast improvement focuses to dispense with these issues, subsequently to get an all the more outwardly satisfying or educational picture or both.

Disadvantages

Image/feature to have poor difference: the low quality of the utilized imaging gadget, absence of skill of the administrator, and the unfriendly outer conditions at the season of securing.

Techniques that break down a picture into high and low recurrence signals for control.

A Large-Scale Hierarchical Multiview RGB-D Object Dataset.

In this paper, they present an extensive scale; various leveled multi-perspective item dataset gathered utilizing a RGB-D cam. The dataset contains 300 articles sorted out into 51 classes and has been made openly accessible to the examination group in order to empower quick advance in light of this promising innovation. This paper depicts the dataset gathering system and presents strategies for RGB-D based item acknowledgment and recognition, showing that consolidating shading and profundity data considerably enhances nature of results.

They have displayed a substantial scale, progressive multi-perspective item dataset gathered utilizing a RGB-D cam [3]. We have demonstrated that profundity data is extremely useful for foundation subtraction, feature ground truth annotation through 3D recreation, object acknowledgment and article location.

Advantages

They are sure that a GPU-based usage of the portrayed methodology can perform multi-object discovery progressively.

The leave-grouping out assessment is substantially more difficult, and here joining shape and visual highlights essentially enhances exactness.

Disadvantages

This method gives great division for some articles in the dataset, however is still tricky for little, dim, straightforward, and intelligent items.

The accessibility of open picture archives and acknowledgment benchmarks has empowered quick advance in visual article class and occur.

II.HISTOGRAM EQUALIZATION

This technique typically increases the global contrast of many pictures, particularly when the usable data of the picture is presented by near contrast values. So this work, if the HE capacity is known, then the exact histogram can be recovered. The evaluation is not computationally concentrated. A disadvantage of the technique is that it is indiscriminate HE often delivers unrealistic effects in photographs; x-ray pictures, often the same class of pictures that user would apply false-color to. Also histogram leveling can produce undesirable effects (like visible picture gradient) when applied to images with low color depth [4].

The cutting edge evaluating models of the picture histogram utilizing the Gaussian mixture model (GMM) and partitions the histogram utilizing the intersection point purposes of the Gaussian parts. The histograms of shad-

ing and profundity pictures are initially separated into sub-interims utilizing the GMM. The interims of the shading picture histogram are then balanced such that the pixels with the comparable power and profundity qualities can fit in with the same interim. The proposed calculation is hence implicitly depth versatile, and the test results shows the adequacy of the proposed calculation.

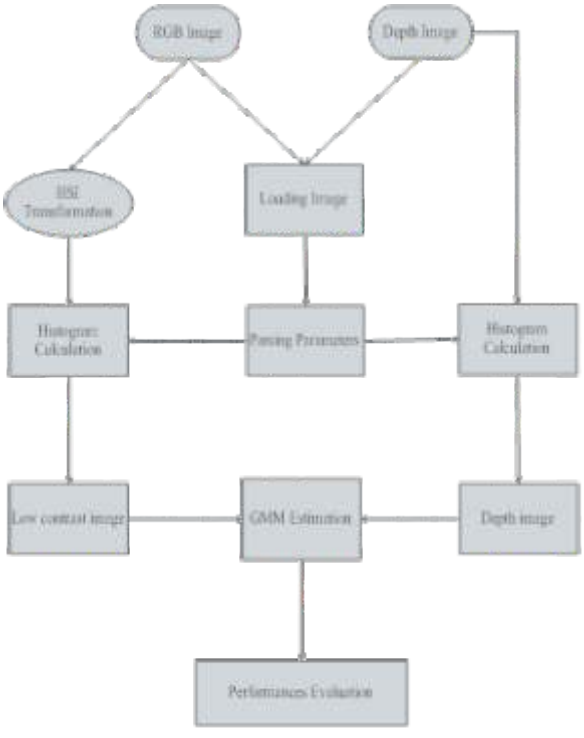

Fig.1:Block Diagram of Histogram Equalization

III.MODULE DESCRIPTION

3.1 DEPTH IMAGE GENERATION

Depth images are acquired by stereo vision system. The 3D data can be acquired from a couple of pictures, i.e... Stereo pair, by calculating the relative depth of points in the scene. Color depth, otherwise known as bit depth, is either the quantity of bits used to show the color of a single pixel, in a bitmapped image /video frame buffer, for every color component of a single pixel. Color depth is a part of color replacement how finely levels of color can be communicated.

3.2 HSI SEPARATION

The Hue, Saturation and Intensity qualities were divided from the RGB picture. Hue is the extent to which a shading can be portrayed as like or not quite the same as shading that are depicted as red, green, blue, and yellow. Saturation is the level of contrast between a shading and dark. Intensity is the shine or bluntness of hues. Intensity is the measure of measure of light force saw by eye paying little respect to the color.HSL are the most widely recognized barrel shaped direction representations of focuses in a RGB shading model. Grown in the 1970s for PC design applications, HSL are utilized today as a part of shading pickers, in picture altering programming, and less generally in picture examination and PC vision.

The two representations improve the geometry of RGB trying to be more instinctive and perceptually pertinent than the Cartesian (3D shape) representation, by mapping the qualities into a barrel approximately motivated by a customary shading wheel. The edge around the focal vertical pivot compares to "tone" and the separation "immersion". These initial two qualities give the two plans the "H" and "S" in their names. The stature relates to a third esteem, the framework's representation of the apparent luminance in connection to the immersion [5].

Seen luminance is a famously troublesome part of shading to speak to the histograms of shading and profundity pictures are initially separated into sub-interims utilizing the GMM. a computerized configuration (see impediments area), and this has offered ascent to two frameworks endeavouring to comprehend this issue: HSL (L for daintiness) and HSV or HSB (V for quality or B for shine). A third model, HSI (I for power), normal in PC vision applications, endeavours to adjust the favourable circumstances and drawbacks of the other two frameworks.

This implies that the shading showed on one screen for a given HSV worth is unrealistic to precisely coordinate the shading seen on another screen unless the two are definitely changed in accordance with outright shading spaces.

3.3 HISTOGRAM CALCULATION

Histogram is the graphical representation of the tonal distribution of the image. The histogram values are calculated for input and depth images. The histogram values were compared and the positions where the histogram values were changing is identified and the points were located.

3.4 GMM ESTIMATION

This uses the Gaussian functions to evaluate the identified histogram changing points. This will shows us which histogram points have to be changed. GMM is a probabilistic model for representing the presence of subdivisions the values belonging to particular color intensity within an overall histogram calculated. In addition, since the semantics of the hidden states is a priori unknown, it is not clear that the dependencies introduced by the GMM are present. We choose to adopt the simpler way, to be confirmed a posterior by comparison with the GMM alternative.

3.5 COLOR ENHANCEMENT

Mapping Curve of Color Intensity is obtained by comparing the estimated histogram of original and the depth image. The region that has to be modified is identified and they are modified. The final result is the contrast enhance color image [6]. In this work, the process has given a image for a particular application. It sharpens the feature of image such as boundaries, edges and contrast make a graphic image for more helpful to display and analysis.

IV.EXPERIMENTAL RESULTS:

In order to evaluate the performance of the proposed algorithm, the Middlebury stereo test images were used in our experiment [7]. The depth images were obtained using the stereo matching algorithm as shown in Fig. 3

SCREEN SHOTS

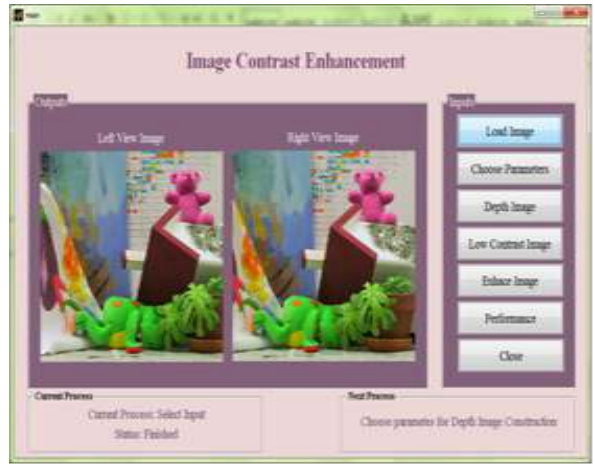

Fig.2:Color Image Cotrast Enhancement



Fig.3:Color & Depth Image Cotrast Enhancement

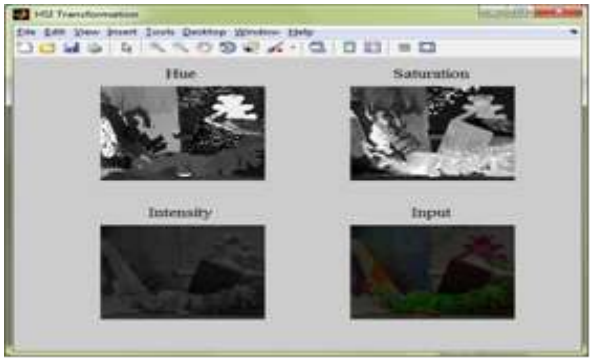

Fig.4:Hue, Saturation, Intensity Evaluation

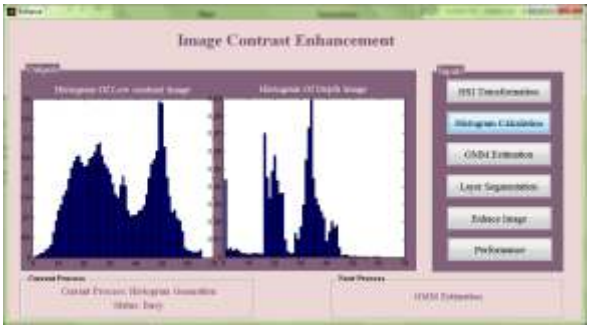

Fig.5:Histogram of Depth & Contrast calculation



Fig.6: PSNR & MSE Values

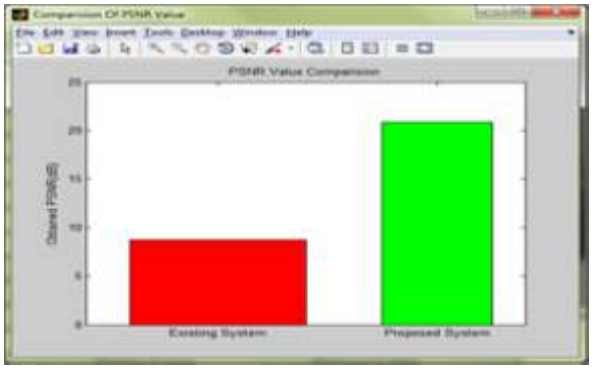

Fig.7:PSNR Comparison between Existing & proposed Systems

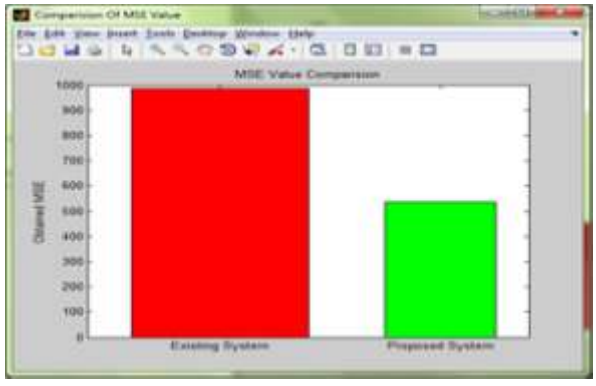

Fig.7:MSE Comparison between Existing & proposed Systems

CONCLUSION

In this paper we proposed a new histogram-based image contrast enhancement algorithm using the histograms of color and depth images. The histograms of the color and depth images are first dividing into sub-intervals using the GMM. The divided histograms are then used to obtain the layer labeling results of the color and depth images. The sub-intervals of the color histogram are adjusted such that the pixels with the same intensity and depth values can belong to the same layer. Therefore, while a global image contrast is stretched, a local image contrast is also consistently improved without the over-enhancement. They plan to extend our layer-based algorithm to a segment-based algorithm by using a joint color-depth segmentation method.

It does not introducing flickering. This is mainly because the fact that the method uses the input histogram, which does not change significantly within the same scene, as the first source of data. This process is applicable to a wide variety of images. It also offers a level of controllability and adaptability through which different levels of contrast enhancement, from histogram equalization to no contrast enhancement, can be achieved.

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