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Pliable Algorithm RGB image Convert in Gray image Using Transformation Equation

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ABSTRACT

Color image conversion in gray image is the technique remodeling the peculiarity of the gray scale images. Gray Conversion emphasizes the aspect of images. In this precursory deed is the conversion color image into gray scale image integrity through new equation. The modus operandi of gray image blend channels is complicated to tow reasonable results. In earlier existing techniques to isolate (RGB) Red, Green, Blue channels from gray image but the lack of consume more than immense memory and time and lesser maintain brightness. The jurisdiction of circumscribed follow the gray conversion during of cumulative probability with improves the image brightness. Outcomes acquire by experimentation demonstrate that implemented of gray conversion improve luminance of gray image. Wherefore it is extremely endorsed to use the adequate RGB in gray conversion during of cumulative probability.

Keywords: *RGB image and Grayscale image, MATLAB.*

1. INTRODUCTION

In this research Pliable Algorithm works of (RGB) Red, Green, Blue image convert into gray scale image. A gray scale image conversion construct different shades of gray color and maintain brightness. There is a demand on the efficient color to gray conversion for computer vision tasks, such as channel reduction for computational load and algorithms for single channel input[1].Color to gray image conversion has been widely used real world application printing color images in black and white format in image processing. The reason for using gray scale represent instead of operate on color image directly that gray scale simplify algorithm reduce computational requirement. In publishing organization printing color image is expensive compared a gray scale image .Thus color images have converted to gray scale image to reduce the printing cost for low priced edition books. Conversion of color image to gray scale image is one of the image processing application used in different fields. In organization of printing color image is costly thus color image converting into gray scale image reduce the printing cost for low price edition books. Digital image processing used biomedical and under water enhancement technique and molecular and satellite [1]. Grayscale image is one of which single image that means one gray image. Monochrome image is gray scale image because monochrome image is single image and one gray image. Grayscale values represent in data matrix and gray scale range is (0,255).Grayscale image for uint8 values range is (0,255) and uint16 range from (0,65535) and for in16 range is (-32768,32767). Conversion of color image to gray scale image most of color image combination of RGB RED,BLUE and GREEN[2]. True Image is also known as RGB image. The luminance of a pixel value of gray scale image range(0,255)[2]. .In this study we have been adopted comparative research and generate the new transformation equation RGB image convert in gray image and thresholding using Matlab.

2. LITERATURE REVIEW

There are several issues related to conversion of RGB image to gray scale image and various solutions to address and these issues have addressed in the literature. The following writing research discusses recent research work focusing on the conversion of RGB image to gray scale image. [2] In 2017 V. Alan Gowri Phivin and A.C. Subhajini proposed the algorithm RGB to gray scale image conversion the application are influenced by the selection of RGB to gray scale method. Matlab based image processing very convenient plat form to construct an algorithm. [3] In 2010 Tarun Kumar and Karun Kumar proposed the A theory based on conversion of RGB image to gray conversion show the intensity value of Red Green and Blue channel and calculate the intensity of gray image and compare the braun method.[1] In 2010 C. Saravanan proposed the color image to color image conversion and the gray scale image algorithm experiment that algorithm has preserved the salient of the color image contrast, sharpness and shadow improve.[6] In 2002 Tomihisa Wlesh and Michael Ashikimin and Klaus Mueller proposed the method and technique Transferring color to gray scale image show the simple technique applied to be a variety of images and provided that texture and luminance are distinct. [4] In 2010 Mohammad Sathik and Ravia Shabnam proposed the technique colored X ray images by bit plane slicing technique and produced various bit level images evulated for Red Green and Blue colors of the

original image with the bit original image and Shows the colors X ray image bit and gray scale X ray image.[5] In 2016 K. Padmavathi and K. Thangadurai proposed the comparative study implementation of Red,Blue and Green(RGB) and Gray scale images in plant leave disease detection Grayscale and RGB images and used median filter for image enhancement and segmentation for extraction of the diseased portion which are used to identify the disease level.[6] In 2015 ByeongJu Lee and Jongwon Choi and Kimin Yun, and Jin Young Choi proposed the method gradient preserving RGB to gray scale conversion using random forest and shows the method the state the arts of the views color contrast preserving and mean square error versus luminance.[7] In 2006 Ricardo L. Queiroz and Karen M.Braun proposed the method color to gray and back: color embedding into textured gray images perform the decoder a wavelet transform the receive gray image the chrominance channels and print to color images with white and black printers able to recover information after words.[8] In 2008 M.C Adik present the method perceptual revaluation of color to gray scale images conversion and total number of assessed the accuracy the preference gray scale image of the art conversion method.[9] In 2008 H.B Kekre and Sudeep D.Thepade present the method of color traits transfer to gray scale images and represent the highly quality of colored images cannot be expressed by the objective criteria such as color image to re color image.[10] In 2017 Akash Gandhamal, Sanjay Talbar, Suhas Gajre proposed technique preprocessing tool for effective segmentation tissue structure in medical images.In this approach mainly concentrates reproduce the new transformation equation for gray conversion using cumulative probability.

3. RESEARCH METHODOLOGY

In this study each color components of red, green and blue appears in model. Each pixel is made up to three colors red, green and blue (RGB) describe corresponding intensities. Color component are also known as color channel. In RGB color model, color image represent intensity function.

$$MRGB = (MR, MG, MB)$$

The intensity of each pixel in a color image total storage of 24 bits. The intensity of each color channel is usually stored 8 bits and which indicates the quantization level is 256. That is a pixel of color image requires storage 24 bits and 24 bit can memory express as 224=256*256*256=16777216 distinct colors[2].

3.1 Gray Scale Image

Gray scale images are represented by intensity values. Gray scale images have many shades a gray in between black and white. The intensity of a pixel value is represented given range 0 and 1 and which gray ranges is 0 and 255 and image pixel are store in binary form.

3.2 RGB Image to Gray conversion

The captured image in RGB image so it necessary to convert from RGB to gray scale image for image processing conversion. The values of three primary colors R.G.B and encodes this linear intensity values convert in gray scale images using probability.

3.3 Cumulative Probability:

Cumulative Probability refers to the probability that the value of random variable falls with in a specified range. Frequently cumulative refers to the probability is less than or equal to a specified value. If we flip a coin two times we might ask: What is the probability coin flip one or fewer head? It would be is zero head plus the one head probability would be equal. For example $P(X \leq 1) = P(X = 0) + P(X = 1) = 0.25 + 0.50 = 0.75$.

3.4 Histogram Equalization

Histogram equalization is a technique for adjust Image intensities to enhance contrast. Let image is represented m_r by m_c matrix of integer pixel intensities ranging from 0 to L-1 is the number of possible integer values is 256.Histogram for each possible intensity.

$$Pn = \frac{no\ of\ pixels\ with\ intensity}{Total\ no\ of\ pixels} \qquad (1)$$

n = 0, 1, ..., L – 1 Luminance detail required then color images should be transformed into gray scale images. The transformation equation using in existing algorithm.

$$\sum Iy = 0.296MR + 0.514MG + 0.1243MB \qquad (2)$$

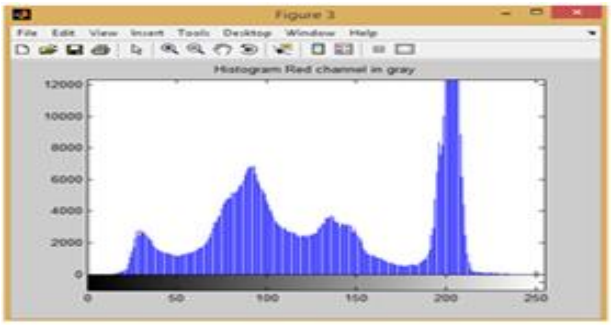

Fig. 1. Histogram Red Channel

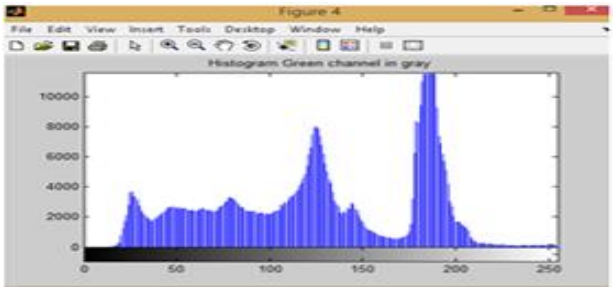

Fig. 2. Histogram Green Channel

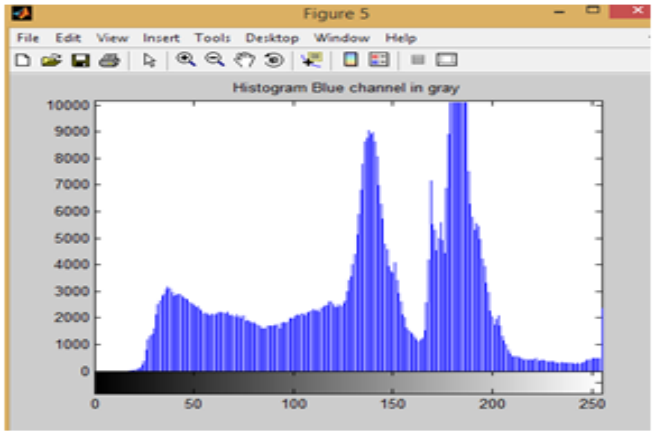

Fig. 3. Histogram Blue Channel

The RGB image is show in fig.4 and fig.5 is input image. Luminance detail required then color images should be transformed into gray scale images. The transformation equation using in existing algorithm[3].

$$\sum Iy = 0.296MR + 0.514MG + 0.1243MB$$

Where MR, MG and MB are the intensity of R and G and B component and Iy is the intensity of gray scale image of RGB image. The fig.1 and fig.2 show histogram red and green channel component and fig.3 histogram blue channel component values are 0to250 intensity values in gray channel. The fig.7 shows red channel component and on of the red channel component. Fig.6 green channel component show pixel region of the fig.10 green channel component. The intensity value of green component at pixel (1,1) is 177. The fig.8 shows blue cannel component and fig.11show pixel region of the blue channel component. The intensity value of blue component at pixel (1,1) is 178. The intensity of pixel one column and one row (1,1) of gray scale image is compute the pixel values of RGB image in equation.

$$\sum Iy = 0.2989 * 203 + 0.5870 * 177 + 0.1140 * 178 = 184.7677 \quad (3)$$

4 .PSEUDO CODE

Step1: Generate the possible path name.jpg.
Step2: Select and convert image rgb into gray image.
Step3: Calculate the pixel value and region using eq.(1).
Step4: Select the and calculate the rgb values in gray.
Step5: Calculate the intensity values using eq.(2)
Step6: Check the loop for each value rgb in gray for(I=0; I<=5; I++) .
Step7: Select three values Mr, Mg and Mb.
Step8: values go to tmp variable.
Step9: go to step 6.
Step10:Find.
Step11:End.

5. SIMULATION RESULTS

In this study in simulation results the RGB image is show in fig.4 is input image. Luminance detail required then color images should be transformed into gray scale images. The transformation equation using in existing algorithm[3]. Where MR, MG and MB are the intensity of R and G and B component and Iy is the intensity of gray scale image of RGB image. The fig.4 shows the rgb model image of human foot and convert in gray image of human foot. The fig.7 red channel component in gray image of human foot and fig.6 green channel component in gray image of human foot. The fig.7 shows red channel component and show pixel region of the red channel component. The intensity value of red component at pixel (1,1) is 203. The figure (6) show green channel component show pixel region of the green channel component. The intensity value of green component at pixel (1,1) is 177. The fig.8 shows blue cannel component and show pixel region of the blue channel component. The intensity value of blue component at pixel (1,1) is 178. The fig.13 shows the comparison value chart of proposed method to articulated the row and column of(1,1) (3,1) (3,3) (7,1) and (7,7) results values has been experimental values.

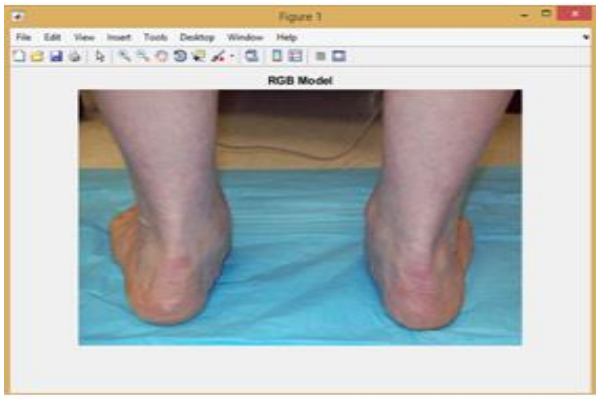

Fig. 4. RGB Model

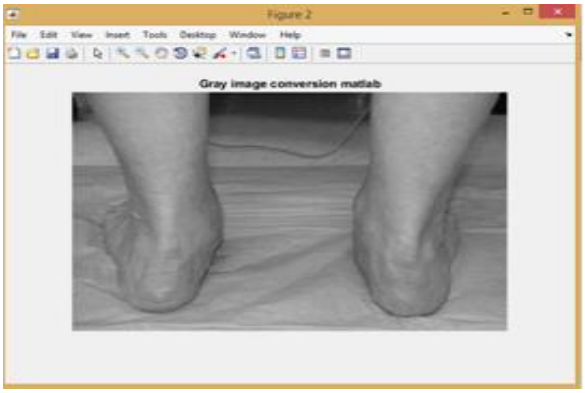

Fig. 5. Gray Image Conversion

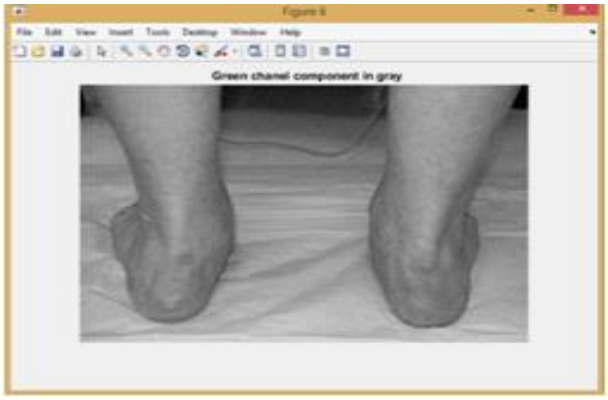

Fig. 6. Green Components in Gray

Fig. 7. Red Components in Gray

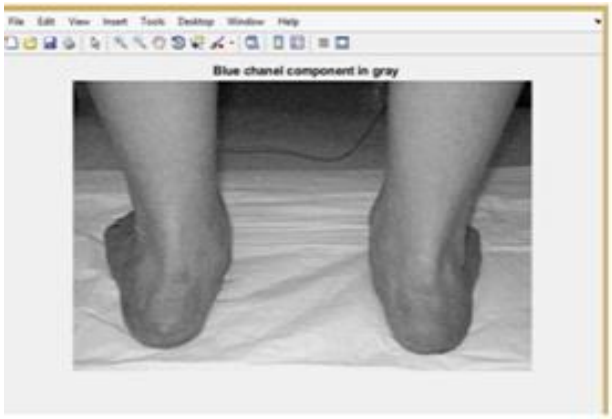

Fig. 8. Blue Components in Gray

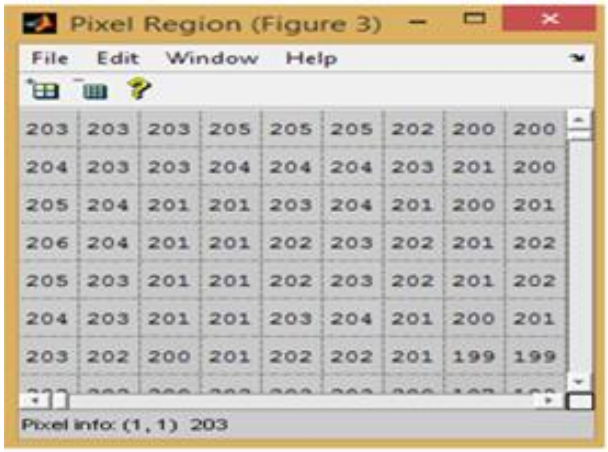

Fig. 9. Pixel Region in Red component

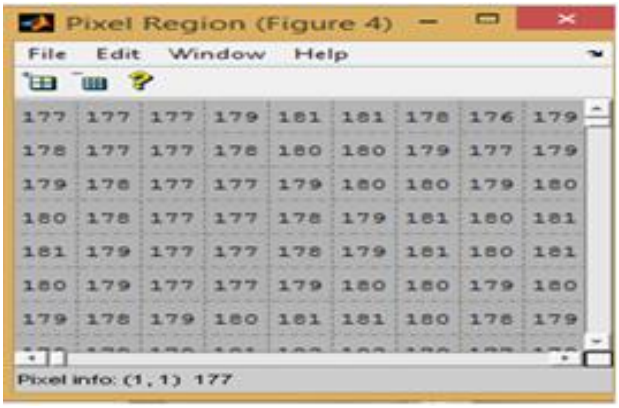

Fig. 10. Pixel Region in Green component

Fig. 11. Pixel Region in Blue component

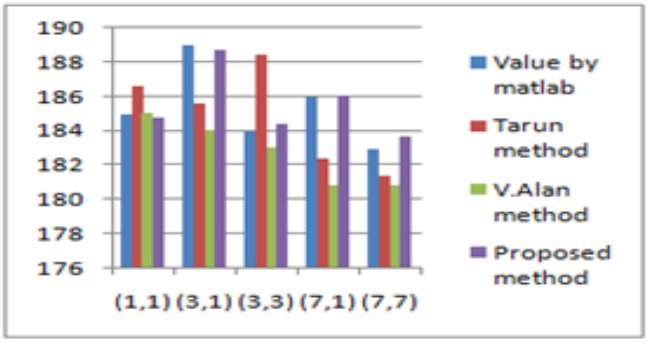

Fig. 12. Proposed Value Chart

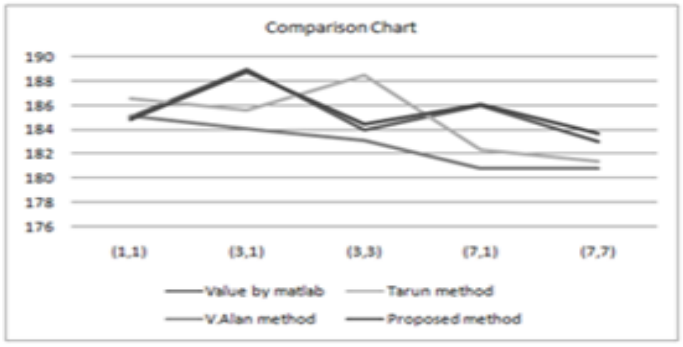

Fig. 13. comparison Value Chart

Table 1: Finding of Researcher in their Respective Research Paper

Pixel	***Value by Matlab***	***By Tarun method***	***By v.Alan Method***	***By Existing Method***	***Percentage Error by Tarrun***	***Percentage Error by V.Alan***	***Percentage by Existing Method***
(1,1)	185	186.5874	185.084	184.767	0.8507541	0.045385	0.046625
(3,1)	189	185.5878	184.0861	188.757	0.8555519	0.046772	0.0473846
(3,3)	184	188.48	183.075	184.384	0.04076	0.471289	0.1415385
(7,1)	186	182.422	180.8329	186.025	0.7795112	0.092320	0.1328571
(7,7)	183	181.4224	180.8329	183.657	0.7811712	0.097666	0.169090

6. CONCLUSION

In this study a new algorithm has been generate the new transformation equation and changed the value for RGB image convert into gray scale image and compares the existing algorithm and percentage error with recent algorithms and techniques. Our existing proposed algorithm is better than recent algorithms. The existing proposed algorithm is helpful various application better quality of gray scale image high required. Gray scale image using RGB reduction and less amount of time. RGB to gray scale image conversion is preferable for gray application MRI, X-ray, Biophsy.

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