

A survey on Gray Scale to RGB Image Conversion

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Abstract— a break which is a split in the bone can be effectively seen by an X-beam in the influenced zone. In any case, now and again these pictures does not having adequate splendor. So these sort of pictures can be prepared by including the shading map. The resultant picture with just the chromatic data is changed. Rather than adding all the RGB shading to the resultant picture, the reference picture "state of mind" shading is utilized. In spite of the fact that adding shading to the dark scale has no much effect, yet the human work is so abundantly lessened. After this expansion of the shading to the first picture, it entirety up points of interest to the objective picture. In this work, first the picture is preprocessed, and after that the colorizing step is finished.

Keywords - Median filter, Color map, RGB Model, Luminance effect.

I. INTRODUCTION

Bone break is split inside the bone. Generally and most individual break their bone least of once in their entire life. The basic indications are: swelling round the influenced range, loss of principle usefulness inside the harmed territory, wounding around the harmed zone, disfigurements of an appendage. The sorts of breaks: basic, stress, comminuted, affected, compound, complete and inadequate.

Bone breaks can be seen by X-beam pictures in influenced zone. An x-beam is a compelling test take a gander at that helps doctors analyze and treatment of the individual.

X-beams imaging are regularly includes presentation to the part of the body to a little amount of ionizing radiation to create photos of within the body. X-beams are the most seasoned utilized type of therapeutic imaging systems. A bone x-beam used to make pictures of any bone inside the body and also the hand, wrist, arm, foot, lower leg, knee, leg or spine.

II. DENOISE THE IMAGE:

Captured X-beam image from the device may destroyed by numerous types of noises. A noise is unwanted information that contaminates the Original image [1]. Noise seems in image from a range of sources.

The types of noises are,

- Speckle
- Gaussian
- Salt & Pepper
- Uniform

These are some of the types of noises which contaminate the Image.



Fig 1. (a) Original Image (b) Noised Image

The picture in fig.1. (b) is contaminated by Salt and pepper style of clamor. Process this sort of picture is troublesome as a consequence of the nearness of commotion that the picture must be sifted exploitation suitable channel [6]. There are different sorts of Filters.

They are,

- Order Filters.
- Mean Filters.

The request channels are unit authorized by forming the area pixels so as from littlest to biggest dim level worth and this request is utilized to choose the right esteem. Request channels territory unit bolstered a specific style of picture measurements called as request insights.

The mean channels work by discovering some sort of a normal inside the $N * N$ window, by utilizing the sliding window idea to prepare the whole pictures [7]. The Mean channel might be a straightforward sliding-window spatial channel that replaces the middle worth in the window with the normal (mean) of all the pixel values in the window. The window is typically square however can be any shape.

In this work, Order channel or Median Filter is utilized to denoise the pictures. As Median channel which gives preferred results over all the channels, it is utilized. The Median channel replaces the middle quality in the window with the middle of all the pixel values in the window [5].

Above procedure is connected to all the pixel values, subsequently evacuating the undesired commotion. The middle channel is additionally asserted to be edge-protecting' on the grounds that it hypothetically safeguards step edges with the exception of obscuring.

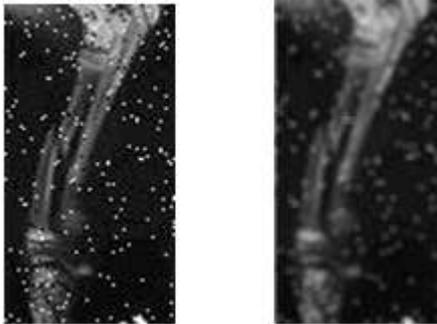


Fig 2. (a) Noised Image (b) Denoised Image

The image in fig.2 (a) is noised by Salt & Pepper type of noise. The image in Fig.2 (b) is denoised by Median Filter.

III. GRAY SCALE IMAGES AND COLOR IMAGES

Gray scale images are formed by only one bit information. They don't have the chromatic information and also called as monochromatic images [4]. The range of these images pixel value is 0 to 255 which shows only the luminance information.



Fig. 3 Gray Scale Image of bone

Shading models portrays how hues are spoken to. There are a wide range of sorts of shading models viz. RGB, CMYK, HSV, LAB, and HSL. In this work, RGB shading model is utilized. This model is utilized normally.

The RGB Color Model is comprises of three shading parts. They are Red, Green, and Blue. The RGB shading model is a valuable shading model in which red, green, and blue light are included in different approaches to imitate an expansive exhibit of hues [2].

The RGB is comprised of 24 bit for every pixel and is indicated by three 8-bit unsigned whole numbers to demonstrate the three shading models. It permits more than 16 million diverse shading blends which is additionally called as real nature [3].

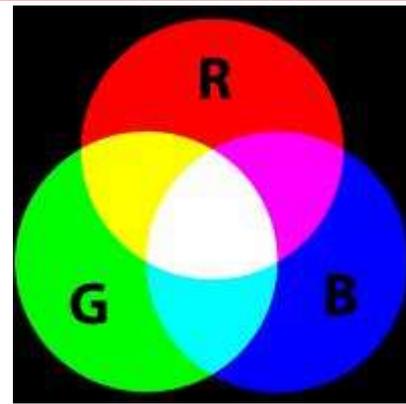


Fig. 4 RGB Model



Fig. 5 RGB Color Image

IV. COLOR CONVERTION

After preprocessing the gray scale image, our second step is to convert it to a color image by using the algorithm for addition of color to the gray scale images,

Step 1: Firstly check the Original image is a gray scale image or not. If it is a color image, directly convert this image to a gray scale image.

Step 2: The Source image i.e. reference image must be a color image.

Step 3: The size of the base Image and the Source image should be calculated.

Step 4: Convert the base image and the Source image to ycbcr Color Space.

Step 5: Normalization.

Step 6: At last luminance is compared.

Step 7: After this comparing the luminance the color mood is taken from the source image and added accordingly to the Original image to form the resultant image.

After this algorithm, the gray scale image is converted into a color image by the luminance effect of the base image. In Fig.

6 gray scale images are converted into RGB images by their respective Source images.

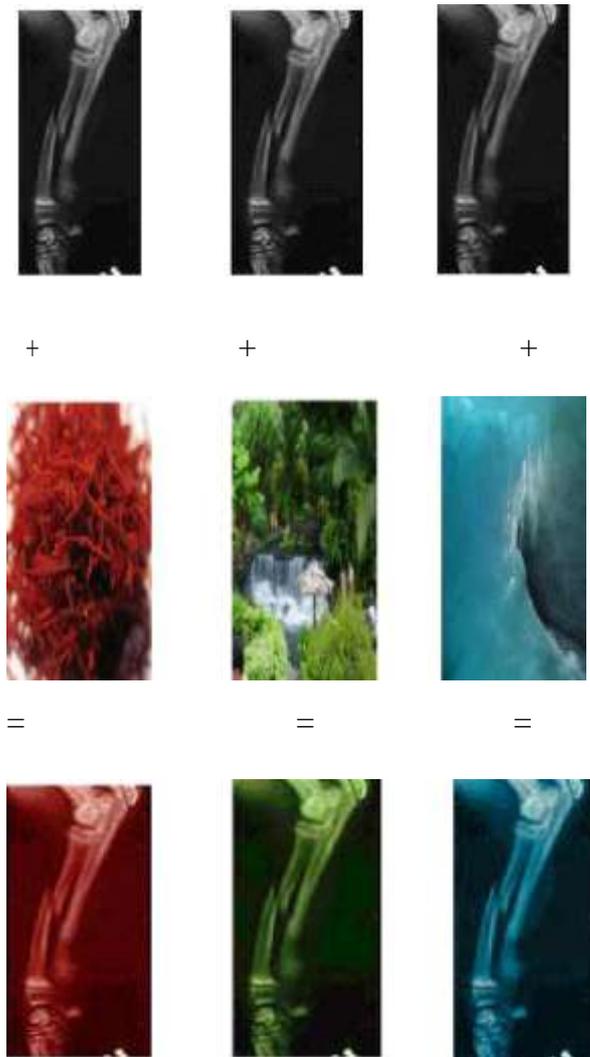


Fig. 6 Results of conversion of gray scale to RGB Images using the Source image

In this work, 10 X-Ray images are taken as samples. These images are processed and running time of images is calculated.

The running time of the algorithm for one image can range from 5 seconds to 1 minute on a Pentium IV CPU using MATLAB code. This Execution time will change from one image to another which depending on the size of the image. The Bone fracture X-Ray image which is taken as an example in the Fig. 6 took a running time of 30 seconds.

V. CONCLUSION

In this work a general, fast, simple technique is used to colorize a gray scale image to a color image using a Reference image. First the Original image is preprocessed to denoise the image. After the colorization process, using this technique many gray scale images are converted into a color image within very less effort. When color is added to gray scale X-

Ray image, it adds up more details to the depth of the bone fracture. These colorized images are very easy for the doctor to diagnose the amount of bone fracture very effectively.

VI. FUTURE WORK

The execution time for running the algorithm to colorize the gray scale image varies from 5 seconds to 1 minutes. Our future work is to mostly reduce the complexity in the algorithm to minimize the execution time. So by reducing this time, more complex gray images can be colorized with a very small amount of time.

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