

# Coloring of Gray Scale Images-A Survey

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**Abstract:** "Colorizing" grayscale image into color image is a technique in this transferring color between a color image and grayscale image and also coloring the grayscale image into the color images with and without texture synthesis. Grayscale images are a combination of two colors black and white, and have many shades of gray in between. Coloring image is adding a chromatic component to gray (black and white) image. Red, Green, and Blue (RGB) color are easily detected by human eyes and can be use in experimental and theoretical work. We transfer RGB colors from a source, a color image to a destination, grayscale image. The luminance element is divided in input color image. The Lossy coding technique is coded luminance image element.

## 1. Introduction

Color is an essential part of an image as provide better quality to an image. Colorizing is a process of transferring color between color images to gray (black and white) images. Transferring the colors to grayscale image increase the visual appeal they make an old image scientific attractive.

RGB color model provides following of the effects to an image due to its three color combination like Brightness defines intensity. Hue is a quality linked with the wavelength in a combination of light waves. Saturation defines to comparatively hue with mixed light white.

Chromaticity is a combination of hue and saturation. Color provides an image with clarity and chromaticity. The gray scale image can be converted into RGB by changing the luminance value. Human interaction is an important part of grayscale image as luminance depends on hue and saturation.

Along with Black and white, some of the gray colors are use to produce gray scale image color. Gray image is also known as black and white image. The intensity of these colors is varying from weakest to strongest intensity, so black at weakest intensity to white at strongest intensity. Grayscale images presence of only one color, one refers to mono and color refers to chrome so these combinations of gray scale images are called monochrome.[1]

RGB color model uses Red, Green and Blue colors to have broader color combination. Colorizing technique in this selects a suitable color image and

transfers the color to grayscale image. Color images are use for better understanding of gray images.



Figure1. Gray scale image

## 2. Literature review

In this section, general technique for coloring the gray scale image with and without texture synthesis main problem is adding chromatic values to a gray scale image has no exact solution. So this is method to minimize quantity the work load. Instead of choosing RGB model to match individual component of an image we directly match the luminance and texture information between two images. For gray scale image we use luminance and chromatic value of the images. This technique can be applied to a variety of images and also provide a texture and luminance are separately. This technique works well in number of images and using higher resolution image and larger neighbourhoods to gain improved results.[2]

In this section, describing other algorithm for transferring color to gray scale image in this RGB image is converted into YUV color model. YUV has been chosen because it provides the luminance value. This method provides a new, fast and user friendly approach to the problem of colorizing gray scale image in this technique the user select a suitable color image from a set of specified regions in the color image. In the next step we use texture synthesis, to colorize the remaining pixels of the gray scale images. Gray scale image become more attractive using colorizing technique.[3]

In this concept we transfer all the color of the color image to the gray (black and white) image. The work of Rujuta R Mahambare helps in minimizing the difficulties occurred during the task.[4]

G.Sapiro, proposed a concept that uses addition of colors to a monochromic image, which is based on the structure of monochrome luminance, as represent the structured of all the colored version.[5]

D. Sýkorá, J. Buriánek, and J. Žára, has used color- by example technique that uses image segmentation, patch-based sampling and probabilistic reasoning technique. This method automatically colored a black and white image when required information is provided. In this procedure the dynamic foreground is colored frame by frame because foreground layer has several visible outlines that affect the shape of homogeneous regions. The problem can be defined in two frames: in first frame each region has defined color index as provided by user-defined palette whereas second uses unlabelled regions. At the last step the color is assign to all the target regions similar to that of frame.[6]

In this section Wang et al. developed a color mapping relationship that trained out by learning based color transfer methods. [7]

Pseudo- coloring with histogram interpolation technique is pixel based pseudo coloring this method has two parts

(i) Luminance matching and (ii) pixel coloring. Here two images are used; the first is the original image and the second one references image. Main purpose of method is to perform luminance matching between the two images and otherwise interpolation scheme is performed for matching. [8]

In this section Haldanker and colleagues have provided the color mapping technique create a mapping of gray scale image to color image use the appropriate existing color map or with creating a new one. As we know coloring the gray scale image has no exact solution but the aim is to perform the task with minimize human labour required. Instead, of use individual component of RGB colors we create a color map which is used to color the grayscale image.[9]

### 3. Applications

Colorization uses chromaticity as well as luminance to explore the features of an image. For example, in airport system X-ray machines are use to check luggage which uses gray scale technique. The luggage can be analyzed in better way by using color technique like RGB by providing different sets of color to different density of an object for example blue can be used for heavier intensity object and light red for lighter intensity object.

Color coding technique can also be used in scientific and educational purposes. In medicine, that uses gray scale image such as Magnetic Resonance Imaging (MRI), X-ray and Computerized Tomography (CT) can be made better and clear by using coloring techniques.

Mundane application can be improve by colorization technique consider a situation where two people are communicating through internet and decided to enhance the meeting through live video. If better colorization software is available they will by

less expensive webcams instead of color one which uses limited bandwidth but still provide better color video streams.

### 4. Conclusions

RGB color uses red green blue color with varying intensities and provides better view of an image rather than gray scale image. According to various experiments that are done over images like luminance, chromaticity etc. are providing better appearance of color image which result in high texture and definition of an image.



Figure2. RGB Colored image

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