Image and Video Portraitization Using Color Segmentation (RGB color model)

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ABSTRACT

Segmentation is the process of partitioning the image into various regions. Segmentation is applied to RGB (Red, Green, Blue) or to HSI (Hue, Intensity, Saturation) color space. It is one area in which best results are generally obtained by using RGB color space.
Color segmentation is basically used in many computer vision applications such as face recognition , object recognition, the real time automatic road sign detection[1] , segmenting acute ,leukemia images is proposed[2],tree image, recognition and feature extraction [3] etc. This paper aims to convert an image in to a portrait using RGB color space.

Keywords- HIS, RGB

I. INTRODUCTION

As we know that today animation is playing wide role in the world of movies, simulation, cartoon pictures, and many more. Well very basic definition of animation is "the sequence of images (with little differences) when shown with in certain limit of time give the illusion of motion". When we talk about illusions it looks like as we are talking about some latest technology but it is not true. Evidence of artistic interest in depicting figures in motion can be seen as early as the still drawings of Paleolithic cave paintings, where animals are depicted with multiple sets of legs in superimposed positions, clearly attempting to convey the perception of motion [5]. As shown below the sequence of images on 5,200-year old earthen bowl found in Iran in Shahr-e Sukhteh and an ancient Egyptian mural[6].

Animation is not only that there are various techniques which were developed with time to give new look to the world of animation some of the techniques we will discussed below

1) Traditional animation: - In this technique the series of handmade sketches (with little differences) are copied on to the transparent celluloid pages also called cells. Then these cells are hand painted and pasted on the top of the colored background. There are many different types of traditional animation some are listed below:-

- **Full animation**
- **Limited animation**
- **Rotoscoping**
- **Live – action/animation**

2) Stop Animation: - This animation use to create the animation by manipulating the real – world objects and showing them in frames which give the illusion of movement. There are many different types of stop animation some are listed below, we are not going in detail as it is available on internet:-

- **Puppet animation**
- **Clay animation**
- **Cutout animation**
- **Object animation**
- **Pixilation**

3) Computer animation: - Computer animation is mainly concern with the 2D and 3D animation where in 2D animation we simply make the object move in 2D environment. 2D Animation focuses on creating characters, storyboards and backgrounds in two-dimensional environments, uses bitmap and vector graphics to create and edit the animated images. Where in case of 3D animation, this graphics uses the 3D representation of Cartesian/geometric data that is stored in the computer for the purpose of performing calculations to give more realistic view as compare to the 2D graphics.

Here we want to convert the still images into the portrait using RGB color model and to convert the video clip into animation which will give more realistic view. And we can easily convert the video in to animation with any need of designing different characters, any additional software etc. Previously the work has done by many researchers, who has try to convert the still images into the cartoon, or in animation or portrait form. Also try to recognize the

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various objects. Xiaosong Wang School of Information Beijing Forestry University Beijing, China School of Engineering Shandong Institute of Business and Technology Yantai, China, Xinyuan Huang, Hui Fu School of Information Beijing Forestry University Beijing, China has proposed the method of recognizing the image of a tree over HIS color model. Similarly Nor Hazlyna Harun, *MY Mashor, *NR.Mokhtar, *Aimi Salihah, A.N, #Rosline Hassan,*R.A.A. Raof, *MK Osman ,*Electronic & Biomedical Intelligent Systems (EBItS) Research Group, School of Mechatronic Engineering, Universiti Malaysia Pedis, 02600 Jejawi, Arau, Pedis, MALAYSIA # Department of Haematology, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, MALA YSIA has proposed the method of Comparison of Acute Leukemia Image Segmentation using HSI and RGB Color Space.

Mostly all the researchers perform their research over HSI color model but here in this paper author has proposed the algorithm over RGB model.

II. METHOD

This section will discuss about experiments that have been conducted to reveal the performance of RGB in identifying color of an images (of human, animals, nature, or any other object). The RGB segmentation involves finding specific color by comparing the RGB values with threshold [2].

Here we have applied various steps for converting the image into portrait as mentioned below.

In the below given steps in the form of flowchart, we have shown the process involved in performing the operation of converting image into portrait.
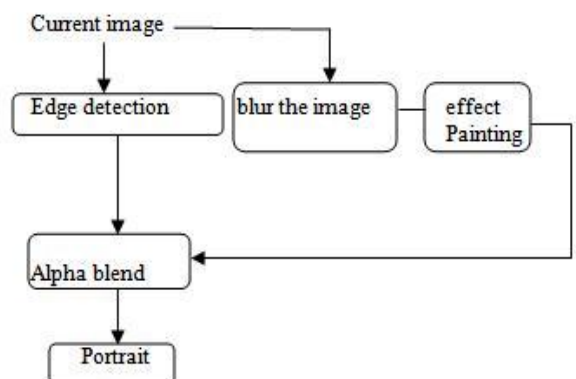

Fig l Converting image into portrait

Here in edge detection technique author has used a sobel operator, the edge detection algorithm help us to find the connected curves or lines that help us to find the boundaries of any object, find the shape of an object, find the expressions on face, detect various body parts etc.

Sobel operator calculate the gradient of the image intensity at each point here by the term calculating the gradient means directional change in the color or intensity of the image (from light to dark). This rate of change of the color or intensity shows whether the particular point belongs to the edge or not.

After that author has blur the image to reduce the noise in the image and author has used Gaussian blur for the same.Gaussian blur, blur the image by using Gaussian function where a Gaussian function (named after Johann Carl Friedrich Gauss) is a function of the form:

$$f(x) = ae^{-\frac{(x-b)^2}{2c^2}}$$

for   some real constants a, b, $c > 0$,and $e \approx$ .718281828 (Euler's number).
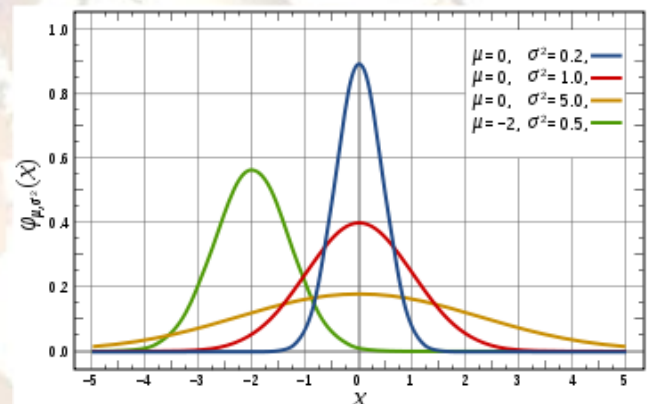
The graph of a Gaussian is a characteristic symmetric "bell curve" shape that quickly falls off towards plus/minus infinity. The parameter a is the height of the curve's peak, b is the position of the centre of the peak, and c controls the width of the "bell".[4]

Where image noise refer to the unwanted change or variations in the brightness or color of the image.

After that the author has applied the method of effect painting in which author randomly select any color pixel on the image and the comparing the value of that pixel to each nearby pixel, if the difference between the values of both the pixels is less than the threshold value then both pixels are considered with almost same color. And finally that region of the image is filled with the average of all pixels that falls in that region.

Finally the author has done the alpha blending, in this process the two images (foreground and back ground images) are combined and new blended image is produced. The degree translucency of

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foreground color may range from completely transparent to completely opaque. If the foreground color is completely transparent, the new blended image color will be the background color and vice-versa.

Now we will see the conversion of video clip into animation, in this case we will follow the steps shown below
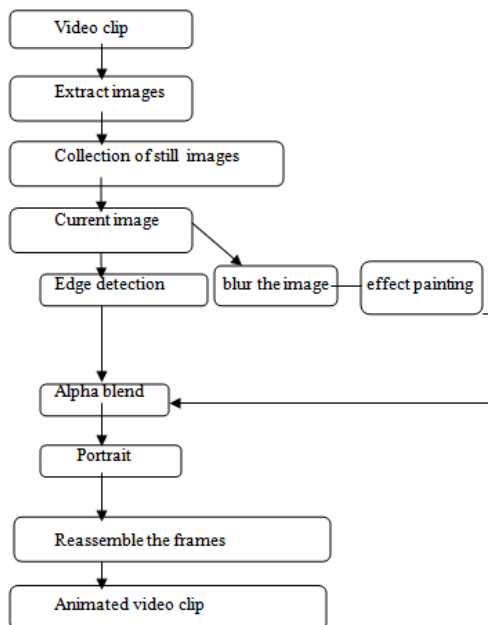

Fig 2 showing the conversion of video clip into animated form

In this process author has firstly convert the video clips into the number of frames (still images) this can be done with the help of various open source software available over internet. Then the author has apply conversion of each images into portrait as author has discussed in previous section. And finally step is to reassemble these converted still images.
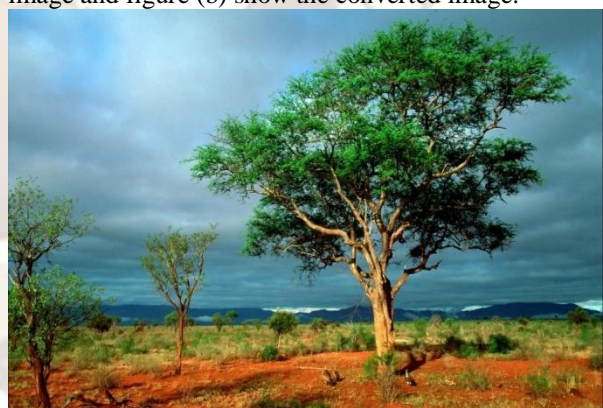
III. RESULT
Now we will see the results showing the conversion of image into portrait, as shown below

(a)

(b) Fig 3. Result 1

This result 1 show the image of a waterfall and stones after applying the algorithm of converting the image in to portrait. Figure (a) show the original image and figure (b) show the converted image.

(a)

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(b)
Fig 3 Result 2

Here the result 2 shows the effect of applying the algorithm on the image of tree, figure (a) show the original image and figure (b) show the converted image.

(a)

(b)
Fig 4 Result 3

Here the result 3 show the effect of applying the algorithm on the image of human face, figure (a) show the original image and figure (b) show the converted image.

IV. CONCLUSION

Here we has analyzed that the proposed algorithm gives better scope in the world of animation and is able to convert the still images of any object (like tree, nature, human face , animal etc) into a portrait over RGB color space, video clip into animation directly with very reasonable amount of time. But there are scopes of further modification in clear recognition of faces and give better results for still images with less bright colors.

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