iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 6 **Issue:** II **Month of publication:** February 2018

DOI:

www.ijraset.com

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 6 Issue II, February 2018- Available at www.ijraset.com

Investigation on Color Separation Concept Using Image Processing Technique

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Abstract: ***Nowadays technology has been developed to favor the people by automation process. Image processing is to extract important data from images. Using this extracted information description, interpretation and understanding of the scene can be provided by the machine. Core point of image processing is to modify images in to desired manner. Image processing plays a vital role in various fields like Agriculture, weather reporting, medical purpose and industries, etc. Several image processing approaches are available in real-time. In this paper have charted three approaches: color discovery, object counting, and color separation.***

Keywords: Image Processing, Color Detection, Counting, Color Segmentation

I. INTRODUCTION

Image processing has been second handed as sensible tool for experiment in distinct application and fields. Image detection is latest technique that are used in various fields like medical purpose, harvest industry and soil scrutinize. The Effective results can be retrieved using the expert tip-off and find the reliable solution at affordable cost. Computer vision approaches are secondhand for precision ranching, which is the method that helps the farmer to cut costs through rational and responsible application by ease in counting the goods as well as selling it. To implement these methods in image processing. Various approaches are surveyed. Since image processing is an approach to perform some operations and analysis on an image, in order to retrieve some information from it.

A. Color Model

Nowadays, theory processing is a growing technology, for detecting and counting the objects various color model approaches are surveyed as follows:

1) RGB color model
2) HSV color model(Hue, Saturation, and Value)
3) Thresholding and orange color detection
4) CMYK color model(Cyan, Magenta, Yellow, and Key)

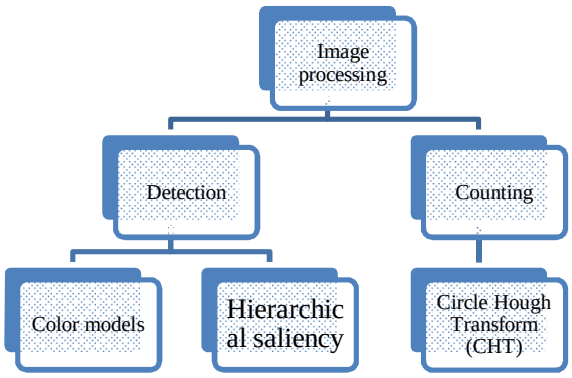

Figure 1.Image processing approaches

B. RGB Color Model

Basically camera works under the RGB color model, which are the three foremost colors (red, green, and blue) by various colors are degenerated. RGB color model relies on a Cartesian yield system. A cube of RGB blew up out of proportion model everywhere a

subspace of success is defined. Each color consists of prime spectral components: (R, G, B).if red, green, blue, black, and white colors are bounded by (255, 0, 0), (0, 255, 0), (0, 0, 255), (0, 0, 0) and (255, 255, 255), respectively. The scale that is recorded from values of 0 to 255 overall changes defines the brightness of image. The diagonal line from black to white in the color model represents gray levels with brightness. The enlarge model of RGB is based on primary additive synthesis, it is not far and wide intuitive .

C. HSV Color model

Instead of using color primaries, the Hue, Saturation, and Value (HSV) or HSB are secondhand as the color descriptions to suggest a greater inherent mechanism for users. In color model the hue (H) of color applies which pure color it resembles. All tints, the tones and shades of red have the same hue intensity. Hues are described by a number that specifies the action of the indistinguishable pure color on the color wheel, as a fifty percent between 0 and 1. The value 0 in the red; one sixth is yellow and one third is green, so explains the color wheel. The saturation (S) of a color in color model describes how the white color is generated. A pure red is naturally a completely saturated, with a humidity of value tensed to be 1; tints of red have saturations few and far between than 1; and white has a saturation of 0.Then the value of a color (V) in color model other than called its lightness, it generally describes how dark the color is presented. The value of A is 0 while increasing the intensity in the color model.

D. Thresholding And Orange Color Detection

Spatial habitat in image processing working that makes use of the plane containing pixels. It is expressional denoted as:

$$g(x,y) = T[f(x,y)]$$

Where input image is mentioned as f(x, y), yield image as g(x, y) , and f has an operator as T defined around a backyard of point (x, y). The smallest possible backyard is of size 1 _ 1. So, value of g depends upon more on the value of f at a specific point (x, y) and T becomes a period of time (also called gray-level or mapping) transformation function of the form

$$s = T(r)$$

Where s and r are variables denoting, the period of time of g and f at any point (x, y).

The background point is detected unless the f(x,y)>T. In image processing, thresholding is secondhand to divide an image into smaller segments, or chunks, by at terminal one color or gray scale value to define their boundaries. Histogram based methods were sensible relative to contrasting image segmentation methods seeing they plainly required solo one pass. A histogram offers the simplest approach to contradict objects through color. The histograms of object were plotted, and identification is carried upon the image. The threshold color values were obtained to differentiate each object from the others, and the images were previously converted from the RGB color space to the HSV color space to get ahead a transcend separation

E. CMYK Color model

This system is called CMYK, where K represents the "key" color black. Black is secondhand in preface to CMY for these reasons:
Getting a black ink can be compromised as CMY mixing.
Text printed in black has excellent detail that would be blurred if printed by all of three diverse colors.
Even though it produces the black, Mixing of CMY doesn't provide the exact darkness of black.
The Half Tone is being used, because more colors in the paper makes it to be soak and hard to dry.

II. COUNTING

Counting place a major role by handling it using the segmentation and identification process. The WBC region which is not consistent is a challenge one in this process. Sometimes, The WBC might be collapsed or overlapped makes the process more tedious to count. For the WBC counting purpose it is significant to behave the clumped cells to achieve a valuable accuracy outcome.

A. Circle Hough Transform (CHT)

Morphological filter and CCL filter is being used to filter the final input image that going to provide for as an input in image processing. CHT method is used for counting and detecting the number of circles available in the image. This was done by finding the circle using the series range of radius from the minimum to the maximum. The radius range was set from 10 to 12 pixels. CHT find the best intersection points based on an equation

$Xi = ai + r\cos\Theta$

$Yi = bi + ri \sin \Theta$
Where,ai and bi is defined as the center of circle.
Xi and Yi will give the parameter of the circle,
Θ is the angle through 360̊ and ri is circle's radius.

III. DETECTION METHOD FOR ASSESSING THE VISUAL PRIVACY LEVELS OF OBJECTS

Visual data with different levels of confidentiality sensitivity can be percolated using various image-processing approaches. Things in a picture normally contain visual data that can possibly expose confidential information; this capability depends on both the visual prominence of the objects and on the distinct classes to which the objects pertain. There are two challenges for this method that are:
Determining a method of effectively detecting generic objects in a photo for the extraction of saliency information.
Determining a scientific method of assessment upon the visual private information contained in objects of the image.
To overcome these opposes a hierarchical saliency detection method that merges a patch-based saliency detection strategy with an objectness estimation strategy to effectively locate salient objects and obtain the saliency information of each object.

IV. RELATED WORKS

Malrey Lee et al in [1], the idea is to produce an efficient procedure to recognize and count citrus by image detection approaches. Citrus detection and counting methods make use of the color characteristics to present a calculation of available citrus in the tree, and the analogous patterns are constructed to suggest a rapid estimation of the citrus yield. The citrus counting techniques consist o various effective steps. This algorithm showed countless potentiality for initial fascination of the yield of a citrus tree.
Syadia Nabilah Mohd Safuan et al [2], Conventionally, WBC is counted manually which sometimes generate an erroneous output as the blood sample rises. Segmentation is one of the main steps in computer aided system. Any decline during segmentation will produce a fault in the upcoming process. This inspected at variance segmentation processes for counting WBC according to color band thresholding. Further, segmentation approach was done to extract the WBC region from the background by relating the prediction of RGB, CMYK and HSV by Otsu thresholding. Eventually, Circle Hough Transform (CHT) is the effective method used to count the cells.
Xuan Li et al [3], Photo privacy protection has gathered more attention from the people. Visual information with various levels of privacy sensitivity can be filtered out using various image-processing techniques. Objects in a photo usually contain visual information that can potentially reveal private information; this potential depends on the visual saliency of the objects and on the specific categories to which the objects belong. Meeting this objective faces two challenges: 1) determining a method of effectively detecting generic objects in a photo for the extraction of saliency information and 2) determining a scientific method for assessing the visual private information contained in objects. To overcome the challenges hierarchical saliency detection method is used. The proposed computational privacy assessment method matches human evaluations to a relatively high degree.
Heng Li et al [4], Visual percepts and electrode array are used in Low-resolution image and retinal identification to get clarity images. But this technique is difficult to complete more complex tasks like face /object detection. Therefore, it is essential to refer and use image processing techniques for reducing the visual perception. The use of saliency segmentation and image processing methods can certainly extricate and enhance objects, and substantially enhance object identification operation.
ZnleiFeng et al [5], to obtain a color pigment that contains superior colors of the photo is done by Mining color themes. Here, they construct a color network to fabricate the intrinsic connection of color details. Using enriched linear iterative clustering (SLIC) algorithm, initial color themes are obtained. The sorted color result can be derived by learning color themes from human. This practically comes out with increased number of span, themes, and accuracy when compared to existing approaches.
Mario Vento et al [6], here the number of persons who cross a virtual line is calculated by using a vision based method. This method determines the changes between each frame in video stream. The effectiveness of the suggested method is confirmed by considering the practical results, mainly when merging RGB and depth information. Using high configuration CPU it counts the number of persons from a large number of video streams in parallel and on low power CPUs embedded on commercial smart cameras.
U.A.Nnolimin[7], exposes an efficient color embellishment structure for logarithmic image processing (LIP)-based methods. This method does image processing by performing many mathematical functions and logarithms to find object in image but it does not modifies the intensity of the image. Whereas the constructed system eludes the translation to complex, non-linear color spaces such

as HSI when generating common outputs without any adjustment of parameters. Thus this method is quite complicated than those other methods.

Michel Jourlin et al in [8],focuses on uses of the LIPC model. This model predicts the color from an image, by stabilizing the image by dynamic range even in high intensity image. Regarding to the implementation of the LIPC operators and methods, information is delivered on their execution time.

KING-SUN FU in [9],detects the objects in the image by using hierarchical saliency detection method that merges a patch-based saliency detection strategy with an objectless estimation strategy to effectively locate salient objects and obtain the saliency information of each object.

simMunir et al in [10], Automatic facial expression recognition have always been a daring task to grasp human activity from real globe images. Certain types of problems are associated with such images that contain poor illumination, different orientations and varying pose. The proposed approach applies Fast Fourier Transform and CLAHE method to overcome the poor illumination. Then merged binary pattern code (MBPC) is generated for every pixel. The results of designed approach are paralleled with diverse variants of LBP and LGC based methods for both holistic and zoned images. Results clearly show that the suggested MBPC based technique exceeds other techniques with 96.5% and 67.2% accuracy for holistic and division based approach respectively.

JyotiJhawar et al in [11], Manual sorting/grading of oranges is performed at wholesale markets/ food processing factories based upon its expire, size, quality and breeds. With an objective to compensate the manual sorting system, this paper suggests the research work for automated sorting of Oranges using pattern recognition techniques applied on a single color image of the fruit. In this two approaches based on Pattern Recognition are suggested – Edited Multi Seed Nearest Neighbor Technique and Linear Regression based technique; although Nearest Neighbor Prototype technique is also used. Experimental results indicate success rate up to 90 % and 98 %.

Changxin-Gao et al in [12],they suggested a simple yet efficient color object, and completed local similarity pattern (CLSP)is used for face detection. CLSP consists of two elements: color label & similarity pattern. LSP has the benefits of hardiness and denseness of coding based extraction procedure. For color image feature extraction, seven various color spaces are chosen and fused to compensate each other.

Francisco-Martinez et al [13], this displays the latest advances carried on by the research community in the field of Pattern Recognition Approach in Computer Vision and Image processing.

REFERENCE	TECHNIQUES	ADVANTAGES	DISADVANTAGES
[1] Fruit detection and counting	Color Detection & Counting	RGB color model method can be used to detect the original image without hiding any information.	By using RGB color model it is complex to segregate the color details from the luminosity
[2] WBC Counting	Color segmentation	It provides highest accuracy which was 96.92% & S-C produced 96.56% of WBC counting.	It is not suitable for noisy images.
[3] PBS detection method	Image Detection	High accuracy allows avoiding false identification	Difficulties with data processing and storing.
[4] Object recognition under SPV	Saliency Segmentation	The graph-based grab Cut algorithm simplifies user interaction and yields robust segmentation results.	Strict conditions are forced by user to name the seed location or fore-ground region with own intellectual knowledge, but such collaborative segmentation are incompatible in some real-time applications required automatically running.
[6] Counting people by OHC	Object Detection	The object can be detected at low noise level.	Not suitable for high density noises
	Adaptive Median Filter	It performs well at low noise	At high noise level it removes

[7] Logarithmic image processing based algorithm		density Easy to implement	image features

V. CONCLUSION

In this paper I have been investigation on rapid development in the field of image recognition. However large numbers of methods in image detection are available, there exist a lot of drawbacks and limitations on the existing methods. The image intensity demonstration as well as identifying the areas of dabbling on images without need to any expert support or manual process or prior knowledge original imageS contents is now days becoming the challenging research problem. Thus to illuminate this problem some more methods were demonstrated and new techniques will be formulated to make better and efficient to detect various colors. In this paper we have surveyed various techniques of detection for digital image detection.

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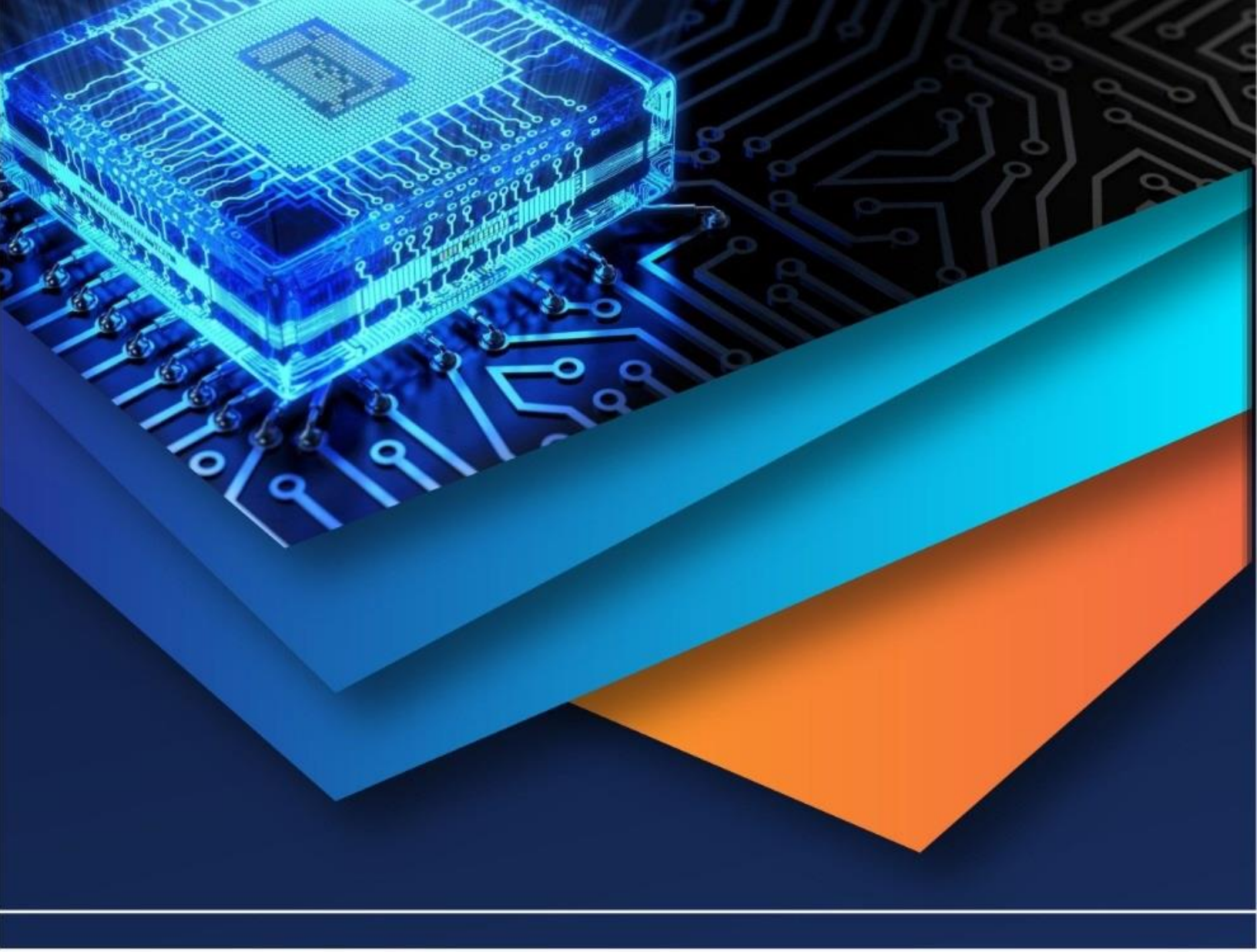

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