_____

Live Image Colour Segmentation Using Different Methods of ANN

Rosan Patel

Department of computer science and engineering,
Vikash Institute of Technology ,Bargrah
Odisha, India

Seema Baghel

Department of computer science and engineering,
Vikash Institute of Technology ,Bargrah
Odisha, India

Sweta Patel

Department of computer science and engineering,
Vikash Institute of Technology ,Bargrah
Odisha, India

Rosy Mishra

Department of computer science and engineering,
Vikash Institute of Technology ,Bargrah
Odisha, India

Abstract: Machine learning is a new dimension of science since last 2 decade which motivates algorithms that can learn from data by building a model, based on inputs and using that to make predications or decisions, rather than following only explicitly programmed instructions. Machine learning is sometimes conflated with data mining, which focuses more on exploratory data analysis. Data mining is the extraction of interesting (non-trivial, implicit, previously unknow and potential useful) patterns of knowledge from huge amount of data
In computer vision image segmentation is the process of partitioning a digital image into multiple segments (set of pixels, also known as super-pixels). The goals of segmentation is to simplify and/or change the representation of an image into something that is more meaningful and easier to analyze. Image segmentation is typically used to locate objects and boundaries (lines, curves, etc.) in images. More precisely, image segmentation is the process of assigning a label to every pixel in an image such that pixels with the same label share certain characteristics. After that by considering region co-ordinates it separates all color in different figure.

Keywords: clusters, Principal component analysis, k-means, modified k-means, Artificial neural networks

_____*****_____

I.   INTRODUCTION

Images is one of the most important medium for conveying information, the process of extracting meaningful information from images is known as image segmentation. Image segmentation is the process where digital images are partitioned into multiple smaller segments that contain meaningful information while having similar features and properties. The goal of performing image segmentation is simplification. Representation an image into a form that is more meaningful and easier to analyze. Image segmentation algorithms play an important role in applications such as medical imaging, bio-metric recognition, object detection, target tracking etc.

For many years, images that were segmented were usually in gray-scale due to the fact that computers were not powerful enough to display and manipulate large, full-color data sets. With the advent of more powerful and easily accessible hardware came a shift in the current of research towards the more widely applicable and more complex problem of color segmentation. Color images generally convey more information as opposed to gray-scale images which allow one to obtain more meaningful and robust segmentation. Misclassification problems that may arise when segmenting gray-scale images can be easily avoided by resorting to color information.

Although image segmentation remains a very hot area of research for the image processing field. Up til now, it is still a challenging task for researchers and developers to create a universal technique for segmenting images.

_____

An extensive literature review related to image segmentation was carried out. The review seeks to survey available segmentation techniques and to understand their characteristics. The techniques that were surveys include edge detection, thresholding, clustering, region-based, and hybrid approaches.

Edge detection methods assumes that pixel properties (e.g. intensity, color or texture) would change abruptly between different regions. Thresholding is based on the principle that segments of an image can be identified by delineating peaks, valleys, and shapes in its corresponding intensity histogram. Clustering techniques attempts to access the relationship among patterns of the data set by organizing the patterns into groups of clusters such that patterns within a cluster are more similar to each other than patterns fit in to different clusters. Region based methods assume that neighboring pixel within the same region or pixel should have similar values. Hybrid methods tend to coalesce boundary detection and region based methods together to achieve better segmentation.

What is Image Segmentation?
Image segmentation is the process of partitioning an image into parts or regions. For example, one way to find regions in an image is to look for abrupt discontinuities in pixel values, which typically indicate edges. These edges can define regions.

II. REQUIREMENT ANALYSIS AND METHODOLOGY USED
Edge Detection Approach: Edge detection attempts to resolve image segmentation by locating edges or pixels between different regions that shows rapid change or transition in intensity values. It locate edges where either the 1st derivative of intensity is greater than a specified threshold or the 2nd derivative has zero crossings. All the edges are identified and then connected together to form the boundaries of the object that will be segmented. The 2 basic edge-detection methods are: Gray Level and Gradient Based methods.

Sharada Mani proposed a method that utilizes simple Circular Shifting for manipulating the whole image at a time rather than template based (Sharada Mani, 2010). Advantages: Performance of the proposed method is satisfactory in almost all cases and runs in polynomial time. Genyun Sun presents an edge detection algorithm based on calculations of the difference in values of 2 clusters (Sun, 2011). Every pixel is placed at the center. This window is partitioned into 2 sub-regions respectively in 4 different directions. Then an appropriate region is chosen to differentiate between 2 region and calculate the edge information. Finally, the non-maxima suppression is adopted to derive the output edge map. Advantages: More robust under noisy conditions.

Thesholding Approach: Thresholding methods are one of the simplest approaches for image segmentation.It is divide the image with respect to their intensity level and used for images with light objects and darker backgrounds. E.g. it chooses a proper threshold T to divide the image pixels into several regions and separate objects from the background. The image is segmented by grouping all pixels with intensity values greater than the threshold into one class and the other remaining pixels into another class.
RafikaHarrabi proposed a technique that combines many realizations of the same image (RafikaHarrabi, 2012). First, most significant peaks of the histogram is determined by utilizing an optimal multi-level thresholding technique based on the 2-stage Otsu optimization approach. Then, the evidence theory is employed to merge multiple images represented in different color spaces. Advantages: High segmentation sensitivity.

Wu Kaihua and Ban Tao have proposed an optimal threshold segmentation method that is based on the entropy criteria and Genetic algorithm in order to improve the image acquisition process in computer vision.Advantages: Efficient in searching and finding threshold.

Cluster Based Approach: Clustering based techniques segment images into clusters that contain pixels with similar characteristics.The grouping of pixels into clusters is based

22

___

on the principle of maximizing the intra class. Clustering technique attempts to access the relationship among patterns of the set by organizing the patterns into group such that the pattern within a cluster are more similar to each other than patterns that belong to another cluster.

GhassanHamarneh proposed a novel method for enhancing watershed segmentation by using prior shape and appearance knowledge (GhassanHamarneh, 2009). The method comprises a training stage and a segmentation stage. In the training stage, a 'shape histogram' and image intensity statistics are used to model prior shape and appearance knowledge, respectively. The segmentation stage is an automatic iterative procedure and consists of 4 steps: Classical Watershed Transformation, Improved K-Means Clustering, Shape Alignment, and Refinement. Advantages: Automatically locates and segments the target.

Biplab Banerjee proposed a method for image segmentation that involves the use of Minimum Spanning Tree (MST) (Biplab Banerjee, 2010). First, MST is performed based on the "natural grouping" of the image pixels to determine the clusters of the pixels. Then, the pixel identified and labeled as the seeds for region growing based segmentation. Advantages: Eliminate the effect of over segmentation that may persists after region growing method.

Region Based Approach: Region based approaches such as region growing, splitting, merging and their combinations, attempts to group pixels into homogenous regions. In region growing approach, a seed region is first selected then expanded to include all homogenous neighbors. This process is repeated until all pixels in the image are classified.

JifengNing presented a region merging based automatic tongue segmentation method (JifengNing, 2010). Advantages: Reduces interference of strong edges around the tongue body, achieves high qualitative and quantitative evaluation measures.
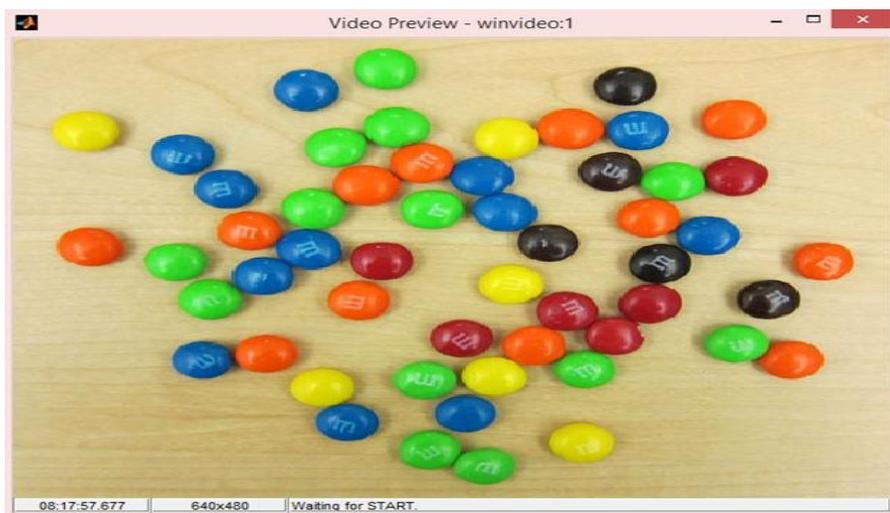
Figure 1: Video input image

Next step will be the complement of a binary image, zeros become ones and ones becomes zeros; black and white are reserved. In the complement of an intensity or RGB image, each pixel value is subtracted from the maximum pixel value supported by the class (or 1.0 for double-precision images) and the difference is used as the pixel value in the output image.
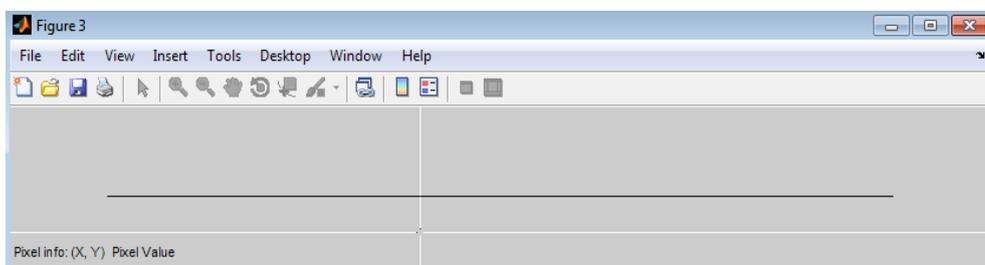

Figure 2: Pixel setting image

Figure 2:impxelinfo creates a pixel information tool in the current figure. The Pixel Information tool displays information about the pixel in an image that the pointer is positioned over. The tool can display pixel information for all the image in the figure.

Proposed Model:

Any scientific and engineering problem is unsolvable until an empirical model is not being invented. In computational world this model are basically called as architecture for commercial as well as noncommercial application. Color real life video segmentation is major challenges of better desig

___
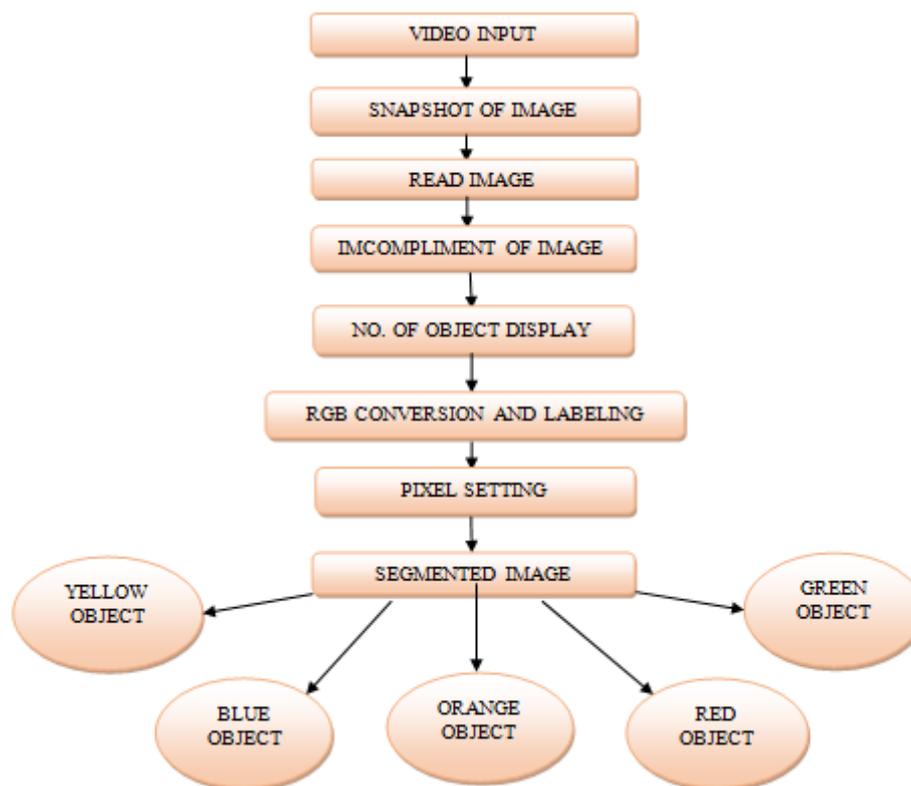
III. RESULT AND ANALYSIS

Color Objects Extraction: The input image contains different objects with different colors.For direct classifying the objects difficult.So for this first extract same color objects.For extracting the same color objects region based segmentation used.

Region Based Segmentation: Segmention stats that the process of input image sub divided into constituent parts or objects that means original image divided into sub images based on application. The segmentation used to object identification, moving object detection, recognisation purpose, traffic control systems, medical systems; machine vision. The image segmentation classifies two ways based pixel value changes.

Region Growing: Region based segmentation one of the technique in the image segmentation. In this method the

original image segmented similarity based approach. In this methodology object extracted based on color means the same color objects extracted by using region based segmentation, because of this reduces the complexity in the object identification.

Region Props: Region props can be used to measure the properties of image by using region props get the information about the each object. In this step find every object properties. By using each object properties we should extract object easily.

Syntax:
S=regionprops(1,properties)
It can be used to measuring the required properties for each object.
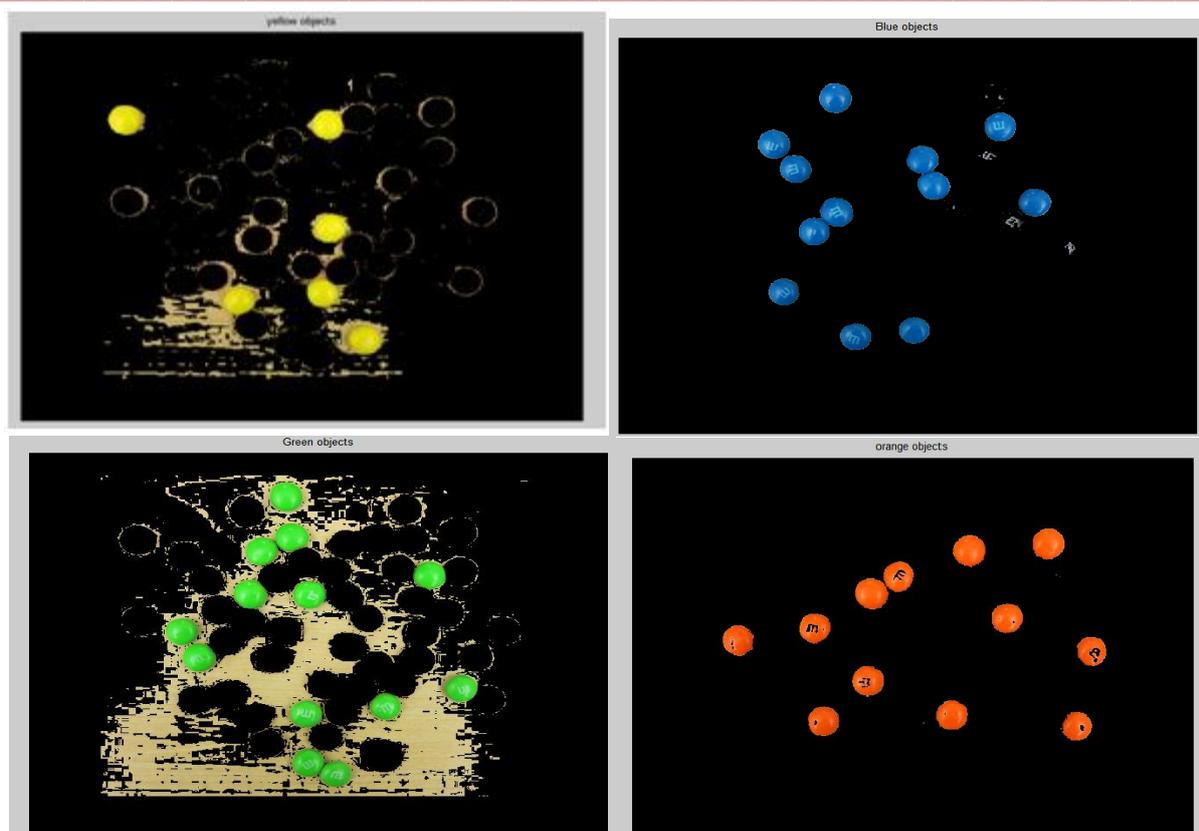
IV. CONCLUSION AND FUTURE SCOPE:

Image color Segmentation is a process of data mining and understanding. It is defined as the process of dividing the image into parts based on region co-ordinates. The purpose of video color segmentation is to make the representation of an image simpler into something that is more meaningful and easier to understand. The process in which a data set or say pixels are replaced by segmentation, pixels may belong together because of the same color, texture etc is known as Clustering based method. The survey has shown that of the existing techniques, main focus is on complex regions. Therefore not much work has been done for the images with mixed regions. The effect of the regions on the segmentation has been neglected by many researchers. The motivation behind the proposed approach is simple and effective. First of all edge preserving smoothing will filter the objects available in digital image so that the complex objects can also be easily detected. However, the use of HSV has the ability to segment the color images in efficient manner. The actual segmentation is done by using the integrated region growing and FELICM based image segmentation algorithm.

REFERENCES

[1] R.C. Barik, R.Mishra, "Comparativ Analogy on Classification and Clustering of Genomic Signal by a Novel Factor Analysis and F-Score Method" Computer Science and Engineering,06,fab,2016

[2] T. Shraddha, K. Krishna, B.K.Singh and R. P. Singh, "Image Segmentation: A Review", International Journal of Computer Science and Management Research Vol. 1 Issue. 4 November 2012

[3] M. R. Khokher, A. Ghafoor and A. M. Siddiqui, "Image segmentation using multilevel graph cuts and graph development using fuzzy rule-based system", IET image processing, 2012.

[4] S. Inderpal and K. Dinesh, "A Review on Different Image Segmentation Techniques", IJAR, Vol.. 4, April, 2014.

[5] G. K. Seerah, K. Rajneet, "Review on Recent Image Segmentation Techniques", International Journal on Computer Science and Engineering (IJCSE), Vol. 5, No. 2, Feb 2013.

[6] N. Dabhi and H. Mewada, "Review on Outdoor Scene image Segmentation", International Journal of Computer Science and Information Technologies (IJCSIT), Vol. 3, 2012.

[7] N. R. Pal and S. K. Pal, "A review on image segmentation techniques", Pattern recognition society Vol. 29, 1993.

[8] R. Dass, Priyanka and S. Devi, "Image Segmentation Techniques", IJECT Vol. 3, Issue 1, March 2012.

[9] S. Saleh, N. V. Kalyankar and S. Khamitkar, "Image segmentation by using edge detection", (IJCSE) International Journal on Computer Science and Engineering Vol. 02, No. 03, 2010.

[10] G. S. Rawat, J. Bhattacharjee and R. Soni, "Proposed Method for Image Segmentation Using Similarity Based Region Merging Techniques", (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 3, 2012.

[11] M. Yambal and H. Gupta, "Image Segmentation using Fuzzy C Means Clustering: A survey", International Journal of Advanced Research in Computer and Communication Engineering, Vol. 2, Issue 7, July 2013.

[12]   Q. Zhu, Z. Song, Y. Xie and L. Wang, "A Novel Recursive Bayesian Learning-Based Method for the Efficient and Accurate Segmentation of Video With Dynamic Background", IEEE transactions on image processing, vol. 21, no. 9, sep, 2012.

Rosan Patel: Btech in Computer Science Engineering FromVikash Institute of Technology Bargarh.

Seema Baghel: Btech in Computer Science Engineering FromVikash Institute of Technology Bargarh.

Sweta Patel: Btech in Computer Science Engineering FromVikash Institute of Technology Bargarh.

Rosy Mishra: Btech   in Information Technology From Trident Academy Of Technology Bhubaneswar. Mtech in computer science engineering From Gandhi Institute Technology Bhubaneswar. Currently She is working as Asst. Professor in the department of Computer science & Engineering, in Vikash Institute of Technology, Bragarh.