

# **An Efficient Approach for Color Pattern Matching Using Image Mining**

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**ABSTRACT:** The main intention of image mining is to produce all considerable patterns without any information of the image content, the patterns types are different.. First method extracts images from image databases or collection of images. Second method mines combination of associated alphanumeric data and collection of images. This increase in number of images and image databases has necessitated the need for image mining techniques. Image mining is an extended branch of data mining that is concerned with the process of knowledge discovery concerning digital images.. It not only finds the different color objects in the image but also localize them according to co-ordinates where they find in the picture. Some of the proposed techniques produced good results and some may not. However, to identify, the entire features the images are to be evaluated, in various views.

**Keywords:** Image Mining, Color object recognition, Image retrieval, Color pattern matching.

## I. INTRODUCTION

Image mining is a vital technique which is used to mine knowledge straightforwardly from image. Image segmentation is the primary phase in image mining. Image mining is simply an expansion of data mining in the field of image processing. Image mining handles with the hidden knowledge extraction, image

data association and additional patterns which are not clearly accumulated in the images. It is an interdisciplinary field that integrates techniques like computer vision, image processing, data mining, machine learning, data base and artificial intelligence. The most important function of the mining is to generate all significant patterns without prior information of the patterns. Rule mining has been adopting to huge image data bases. Mining has been done in accordance with the integrated collections of images and its related data. Numerous researches have been carried on this image mining [1].

## II. IMAGE MINING TECHNIQUES

The techniques frequently used are: Color Object Recognition, Image Indexing and Image Retrieval, Image Classification and Clustering, Association Rules Mining and Neural Network [2].

### A. Color Object Recognition

Object recognition has been an active research focus in field of image processing. Using object models that are known a priori, an object recognition system finds objects in the real world from an image.. The object recognition problem can be referred to as a supervised labeling problem based on models of known objects.

Recently, Jeremy S. De Bonet [3], aiming to locate a particular known object in an image or set of images, design a system that processes an image into a set of “characteristic maps”. Specifically, given a target image containing one or more interesting objects and a set of labels corresponding to a set of models known to the system, what object recognition does is to assign correct labels to regions, or a set of regions, in the image. The system finally selects the object with the highest likelihood as the correct object.

### *B. IMAGE RETRIEVAL*

Image mining requires that images be retrieved according to some requirement specifications. The requirement specifications can be classified into three levels of increasing complexity [4].

- Level 1 comprises image retrieval by primitive features such as color, texture, shape or the spatial location of image elements. Examples of such queries are “Retrieve the images with long thin red objects in the top right-hand corner” and “Retrieve the images containing blue stars arranged in ring”.
- Level 2 comprises image retrieval by derived or logical features like objects of a given type or individual objects or persons. Examples include “Retrieve images of round table”.
- Level 3 comprises image retrieval by abstract attributes, involving a significant amount of high-level reasoning about the meaning or purpose of the objects or scenes depicted. For example, we can have queries such as “Retrieve the images of football match” and “Retrieve the images depicting happiness. Rick Kazman and John Kominek [5] describe three query schemas for image retrieval.

### *C. Image Indexing*

Image mining systems require a fast and efficient mechanism for the retrieval of image data. Conventional

database systems such as relational databases facilitate indexing on primary or secondary key(s). Currently, the retrieval of most image retrieval system is, by nature, similarity-based retrieval. In this case, indexing has to be carried out in the similarity space. One promising approach is to first perform dimension reduction and the use appropriate multi-dimensional indexing techniques that support Non-Euclidean similarity measures. Indexing techniques used range from standard methods such as signature file access method and inverted file access method, to multi-dimensional methods such as KD- B tree, R-tree , R\* -tree [6] and R+-tree to high-dimensional indexes such as SR-tree , TV-tree , X-tree and Min Max. Other proposed indexing schemes focus on specific image features presents an efficient color indexing scheme for similarity-based retrieval which has a search time that increases logarithmically with the database size proposes a multi-level R-tree index, called the nested R-trees for retrieving shapes efficiently and effectively. With the proliferation of image retrieval mechanisms give a performance evaluation of color-spatial retrieval techniques which serves as guidelines to select a suitable technique and design a new technique .

### *D. Image Classification and Image Clustering*

Image classification and image clustering are the supervised and unsupervised classification of images into groups respectively. In supervised classification, one is provided with a collection of labeled (pre-classified) images, and the problem is to label newly encountered, unlabeled images. Typically, the given labeled (training) images are used to do the machine learning of the class description which in turn is used to label a new image. In image clustering, the problem is to group a given collection of unlabeled images into meaningful clusters according to the image content without a priori knowledge. The fundamental objective for carrying out image classification or clustering in image mining is to acquire content information the users are interested in from the image group label associated with the image. Intelligently classifying image by content is an important way to mine valuable information from large image

collection. The classification module in the mining system is usually called classifier. Recognize the challenge that lies in grouping images into semantically meaningful categories based on low-level visual features. Currently, there are two major types of classifiers, the parametric classifier and non-parametric classifier[7]. Image clustering is usually performed in the early stages of the mining process. Once the images have been clustered, a domain expert is needed to examine the images of each cluster to label the abstract concepts denoted by the cluster. Use clustering technique in an attempt to detect unauthorized image copying on the World Wide Web uses clustering in a preprocessing stage to identify pattern classes for subsequent supervised classification. It describe a partition based clustering algorithm and manual labeling technique to identify material classes of a human head obtained at five different image channels.

#### *E. Association Rule Mining*

Association rule mining is a typical approach used in data mining. The first approach is to mine from large collections of images alone and the second approach is to mine from the combined collections of images and associated alphanumeric data.[8] present an image mining algorithm using blob needed to perform the mining of associations within the context of images. An image system called brain-Image. Database has also been developed. .

#### *III. Color Object Matching*

Use color object matching to quickly locate known reference patterns, in a color image. With color object matching, you create a model or template that represents the object you are searching for. Then your machine vision application searches for the model in each acquired image, calculating a score for each match. The score indicates how closely the model matches the color pattern found. Use color object matching to locate reference patterns that are fully described by the color and spatial information in the pattern. [9]

#### **IV. RESULTS:**

##### **Input Case 1:**



Fig 1(a) Original Image

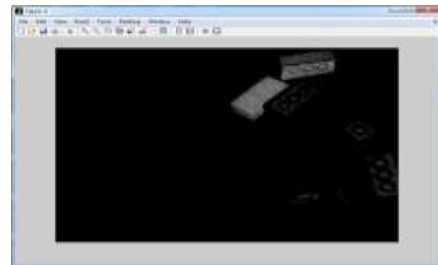


Fig1 (b) Pre-Processing



Fig 1 (C) Red Objects found



Fig 1(d) Green Object found



Fig 1 (e) Blue object found



Fig 1 (f) Yellow Object found

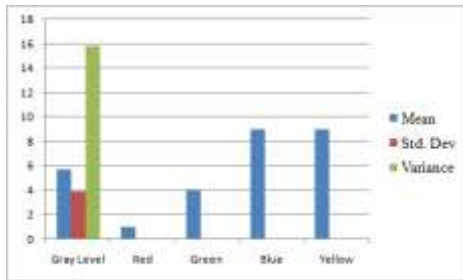


Fig 1 (g) Result.

The original image is shown in Fig 1 (a) after that pre-processing image shown in Fig 1 (b) when we run the project to find the no of red objects are one in the original image. It will show image Fig 1(c) as result for same way to find Green objects are four, Blue objects are nine, Yellow objects are nine in the original image it will show Fig 1(d),(e) and (f) respectively and graphically representation our result is shown in Fig1 (h).

**Table 1 Estimated Statistics degree from various color images**

Test Sample	Statistics degree	Gray-level image	Color image components			
		Gray level	Red	Green	Blue	Yellow
Fig.1	Mean	5.7	1	4	9	9
	Std.dev	3.9				
	variance	15.8				

**Input Case 2:**



Fig 2 (a) Original image



Fig 2 (b) Pre- Processing



Fig 2 (c) Red object found



Fig 2 (d) Green Object found



Fig 2 (e) Blue object is not found



Fig 2 (f) Yellow Object found

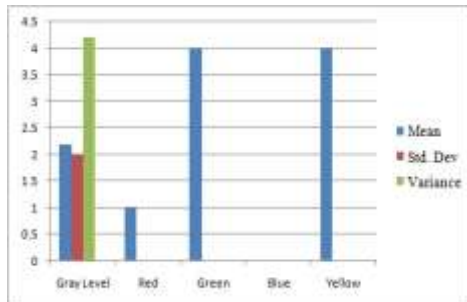


Fig 2(g) Result

project to find the no of red objects are one in the original image. It will show image Fig 2(c) as result for same way to find Green objects are four, Blue objects are zero, Yellow objects are four in the original image it will show Fig .2(d),(e) and (f) Respectively. and graphically representation of our result is shown in Fig 2(g).

**Table 2 Estimated Statistics degree from various color images**

Test Sample	Statistics degree	Gray-level image	Color image components			
		Gray level	Red	Green	Blue	Yellow
Fig.2	Mean	2.2	1	4	0	4
	Std.dev	2.0				
	variance	4.2				

**Input Case3:**

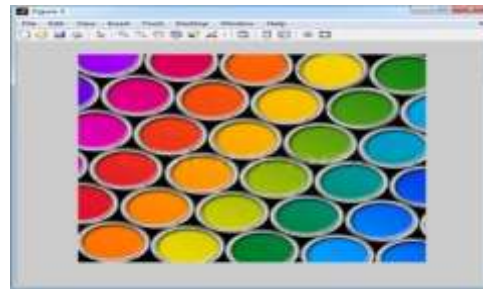


Fig 3 (a) Original image



Fig 3 (b) Pre-processing

The original image is shown in Fig 2(a) after that pre-processing image shown in Fig 2 (b) when we run the





Fig 3 (c) Red object found

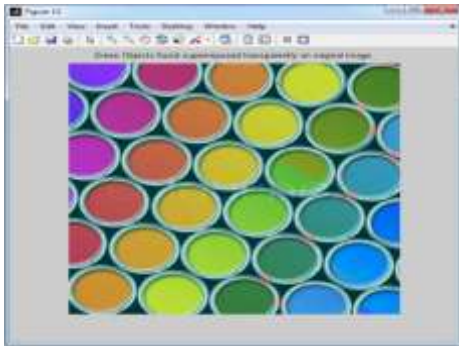


Fig 3(d) Green object found

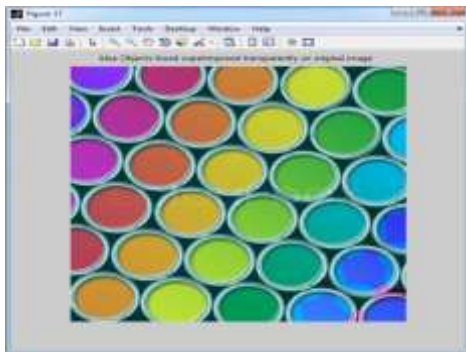


Fig 3 (e) Blue object found

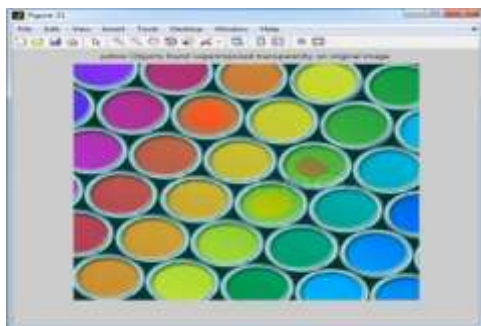


Fig 3(f) Yellow object Found

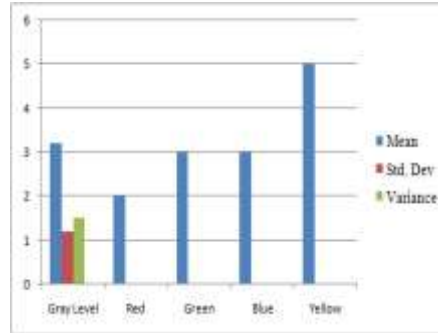


Fig 3(g) Result

The original image is shown in Fig 3 (a) after that pre-processing image shown in Fig 3 (b) when we run the project to find the no of red objects are one in the original image. It will show image Fig 3 (c) as result for same way to find Green objects are four, Blue objects are zero, Yellow objects are four in the original image it will show Fig 3 (d),(e) and (f) Respectively. and graphically representation of our result is shown in Fig 3(g).

**Table 3 Estimated Statistics degree from various color images**

Test Sample	Statistics degree	Gray-level image	Color image components			
		Gray level	Red	Green	Blue	Yellow
Fig.3	Mean	3.2	2	3	3	5
	Std.dev	1.2				
	variance	1.5				

**Input case 4:**

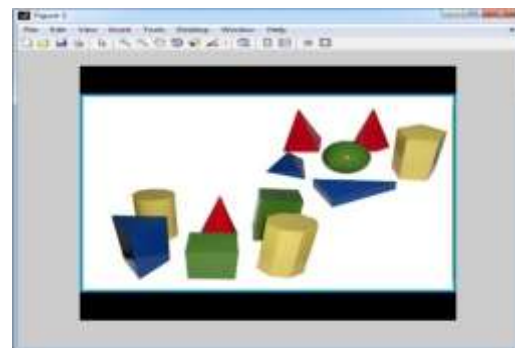


Fig 4 (a) Original Image

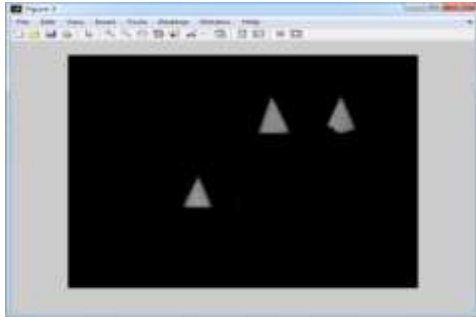


Fig 4 (b) Pre-Processing

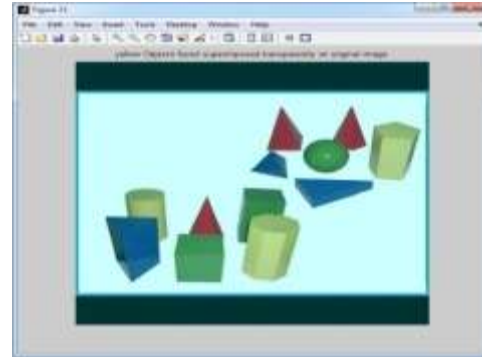


Fig 4 (f) Yellow object found

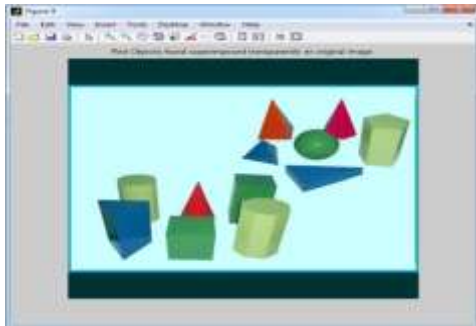


Fig 4(c) Red object found

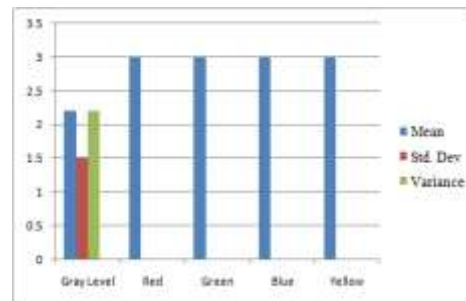


Fig 4 (g) Result

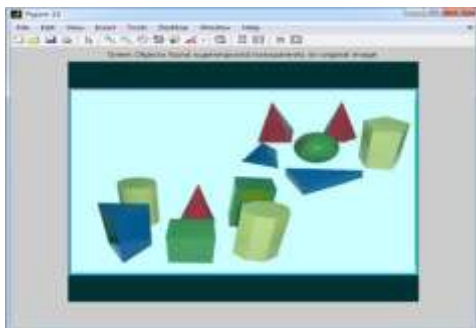


Fig 4(d) Green object found

The original image is shown in Fig 4 (a) after that pre-processing image shown in Fig 4 (b) when we run the project to find the no of red objects are one in the original image. It will show image Fig 4 (c) as result for same way to find Green objects are four, Blue objects are zero, Yellow objects are four in the original image it will show Fig 4 (d),(e) and (f) Respectively. and graphically representation of our result is shown in Fig 4 (g).

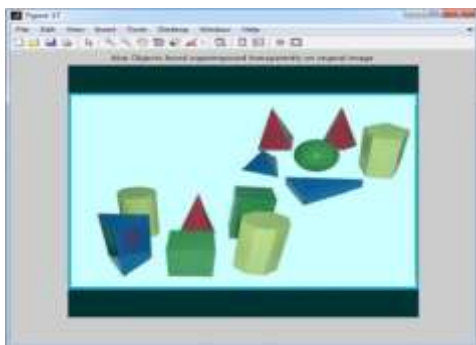


Fig 4 (e) Blue object found

**Table 4 Estimated Statistics degree from various color images**

Test Sample	Statistics degree	Gray-level image	Color image components			
		Gray level	Red	Green	Blue	Yellow
Fig.4	Mean	2.2	3	3	3	3
	Std.dev	1.5				
	variance	1.2				

#### IV. CONCLUSION & FUTURE SCOPE

From experimental results it can be concluded that the method proposed is best suitable to find a particular color pattern in the images. Results have been concluded for red, green, blue and yellow colors but can be applied to large variety of colors by changing the preprocessing portion of the image. It not only finds the different color objects in the image but also localize them according to co-ordinates where they find in the picture. Some of the proposed techniques produced good results and some may not. However, to identify, the entire features the images are to be evaluated, in various views. The Main goal of image mining is the discovery of image patterns that are significant in a given collection of images. New techniques are being generated and many area left for the future enhancement and this study of review is found that still few more methods needed to identify. One main limitation from which it show some irrelevant results is the concluded objects in the image. So in future, work can be done to separate and localize the concluded objects.

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