Detection of Content-Based Image Retrieval Using OCR Tools

A. MariyanRichard, N. H. Prasad, and S. Kavitha

Abstract In the field of image processing content-based image retrieval is having research scope to retrieve the images which is stored in any location on the network. In the content-based image retrieval system to check images which are deposited on the network based on image attributes like image size, name of the image, shape, and color of the image. This work gives a novel method for system retrieve the image based on the text query given by the user. The scope of the paper also extends the scope to finding the similar combined images containing text and also graphical shapes. In the proposed system we can retrieve the images by using Optical Character Recognition system. The important scope of the proposed methodology is to produce accurate result even in the case of invariance to difficult graphics and background features, text design, and different font size. The approach has been tested for retrieving images of English text based on the provided text. We put forth a brand-new method for creating a content-based picture retrieval system based on locating images with the same textual information within an image.

Keywords CBIR · Text extraction · OCR · Color histogram

1 Introduction

Given a query image, content-based image retrieval (CBIR) leverages visual contents to index and retrieve related images from sizable image databases. The manual annotation approach was initially more challenging due to the massive image collections [1, 2] that were available. To get around these obstacles, (CBIR) was introduced. CBIR is the use of computer vision to solve the issue of image retrieval. CBIR is a method for recovering images based on automatically detected characteristics including color, texture, and shape. The architecture of a CBIR system can be characterized as a fundamental collection of interconnected modules that work together

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to obtain database images in response to a specified query [5, 7]. The CBIR retrieval system may query photographs or sketched figures to recover them. The CBIR system has two stages: searching and indexing. During the indexing step, a feature vector capturing the appropriate attributes is solved for every image in the image database and saved in a visual feature database. When a user inputs a request during the searching phase, a feature vector for that query is generated. In this paper [3], we can do one or more straightforward keyword searches and then retrieve relevant images using text-based retrieval. We can use specific text that has previously been stored in the database using optical character recognition (OCR) techniques in the CBIR. The study discusses and evaluates the difficulties and issues that have arisen as CBIR approaches have developed in recent years, and it covers a variety of segmentation, edge, boundary, region, color, texture, and form methods.

In the research [4, 8] there are two fields are recognized for content-based visual features such as common and field specific visual contents namely face recognition, task-dependent applications, etc. The two steps that make up CBIR are feature extraction and image matching. The method of extracting detectable amounts of picture features is called feature extraction [10]. Feature vectors are data taken from photographs, such as color, texture, and shape. Using the features of both photos, image matching requires comparing them with certain text. Depending on the text, images can be found by searching the database for features that are similar.

The proposed methodology is organized as follows. In Sect. 1: Related work, in this section tells us the related works that were carry out in the previous related papers. The next Sect. 2: Proposed system, this section explains the proposed system CBIR which tells how its works with text based to retrieve image by using OCR format system. Then in the Sect. 3, contains conclusion and the future enhancement of the proposed system.

2 Literature Survey

In early survey of CBIR, Arthi et al. [1] this paper deals with new approaches that have been proposed in recent years for efficient search and retrieval of document images. In early CBIR we can use the image retrieval based on their shape, texture, and color. Prajakta R. Thakare [2] presented survey of current content-based image retrieval systems using color as a feature. Valli Madhavi [3] have proposed the methodology for automatic analysis and retrieval of images from the image database. If manmade and natural objects are in the image, the retrieval is tedious job. Reshma Chaudhari et al. [4], to reduce the time complexity of the image retrieval can consider the approximate shape rather than the exact shape. In this paper author proved the best accuracy in the combination of color and shape-based image retrieval. Ruziana Mohamad Rasl [5], the study is done for optimization techniques in multimedia databases and also implemented query optimization classification method. Nithya et al. [6], this paper proposed a system for Kannada document image database to attain the image search.

Patel and Meshram et al. [7], discussed a study on research issues in area of content-based video retrieval systems and used features for choosing, indexing, and ranking. Muzhir Shaban Al-Ani et al. [8], in this category, the user can retrieve the image based on visual features (low level features) which are extracted from images such as color, shape, and texture.

Dharani et al. [9], this paper concentrates in finding the unlabeled images using the MKNN algorithm. John Zachary and Iyenga [10], this paper proposed methodology depend on the information theoretic concept of entropy for an real valued representation of color. Yasmin et al. [11], in this paper discussed the comparison of target image and input image database with the indexing scheme to retrieve the image.

Katherine et al. [12], in this paper given a framework for accomplishment of content-based image retrieval using Bayesian statistics.

3 Proposed System

3.1 CBIR Using Text

In the existing system of CBIR [6, 7] finds an image of similar type by applying a input image that includes in associating the feature vectors of other images in the stored database with the given image using particular features. The feature vector for input image is histograms of its color and total number of bins in the color histogram. In the existing system, the image were retrieved by using the picture, some pictures will be very large in size so, while giving that images as input we find some difficulties. These disadvantages are overcome by introducing the text in the proposed system. Published and implemented image retrieval systems have mostly focused on a picture's basic attributes, such as color, form, and texture, with little to no attention paid to the image's associated text section. In this study, we created an image retrieval system that searches a library of thousands of photographs for comparable composite images that include text and graphical shapes. We have shown how this technology outperforms commercial OCR technologies by putting forth a methodology for feature extraction and searching on of the text images. Its ability to handle the demands of invariance to font size, design, and text region orientation, as well as its capacity to produce accurate results even in the presence of intricate backdrop and graphical data, is this work's distinguishing feature. The proposed method given an appropriate output for the English paragraphs.

In this paper we can retrieve the images using textual content. This system basically focuses the images on three stages (Fig. 1).

Text image retrieval is to retrieve their image by using OCR. First, text can be retrieve by using OCR. We can select the image and paste it in the paint then by using OCR template we can enter the text based on the certain text character. We can select the image using text.

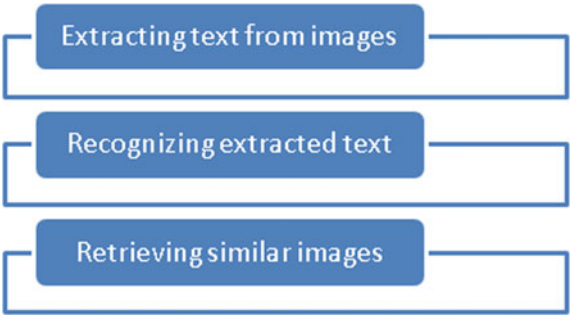

Fig. 1 General steps involved in image retrieval system

The majority of previously described image retrieval algorithms have been focused on the color, texture, or geometry of the graphic object in a picture. However, these attributes are not suitable for identifying and utilizing the image's textual content as a feature for matching with other photos in the database. Using composite pictures that mostly consist of text and a few graphical features, we have suggested a novel technique for text recognition and extraction. Translation, scaling, and rotation are the three fundamental types of transformations to which the suggested approach is invariant. This research suggests a novel post-processing technique for error correction depends on spelling in OCR, which is based on connected components and directional chain codes of textual regions.

4 Results and Discussion

In this form, the user can first login their username and password. If the username and password can be match we can upload the images.

In this Fig. 2 we can discuss how the image can be retrieve by using OCR tools. First, the user can give the query text. Based on the query text the image can be matching with the given text. Image will be compared with the Text Localization, Text Extraction, and OCR text. After the text can be compared with the image then it will allow to the certain database for matching the text with the image. After the identification of certain images with text, it will be retrieve.

In this slide we will upload the images (Fig. 3). First we choose the image to be upload by using the choose file button. By selecting the choose file button, a window will be displayed. By using the OCR we have typed the text already. Then, we can choose the image that we want to upload.

In the text box we can type the word that is used as keyword for searching the image (Fig. 4) in the database. Based on the text we can retrieve the image.

The images with the related keyword will be displayed. In the Fig. 5, output of character extraction on various images has been shown for various types of alignments of text. Then, in the current work, compared the output of the given method

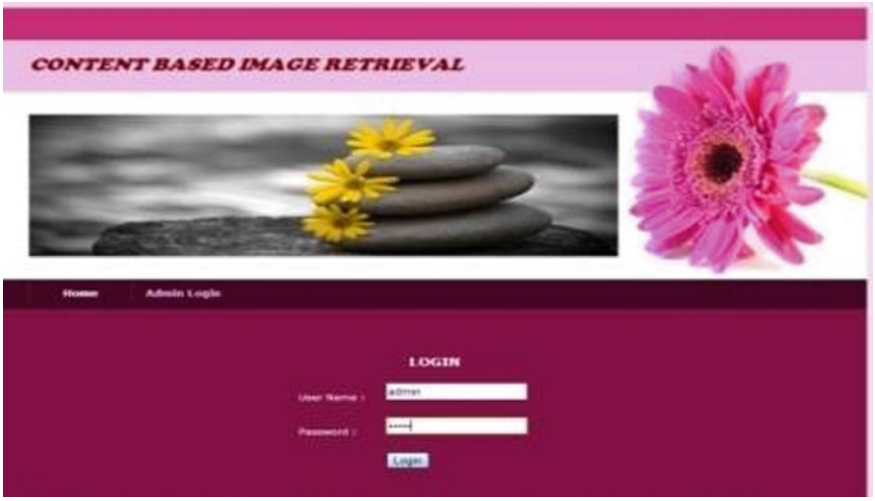

Fig. 2 Image retrieve using text

Fig. 3 Image selection from the database

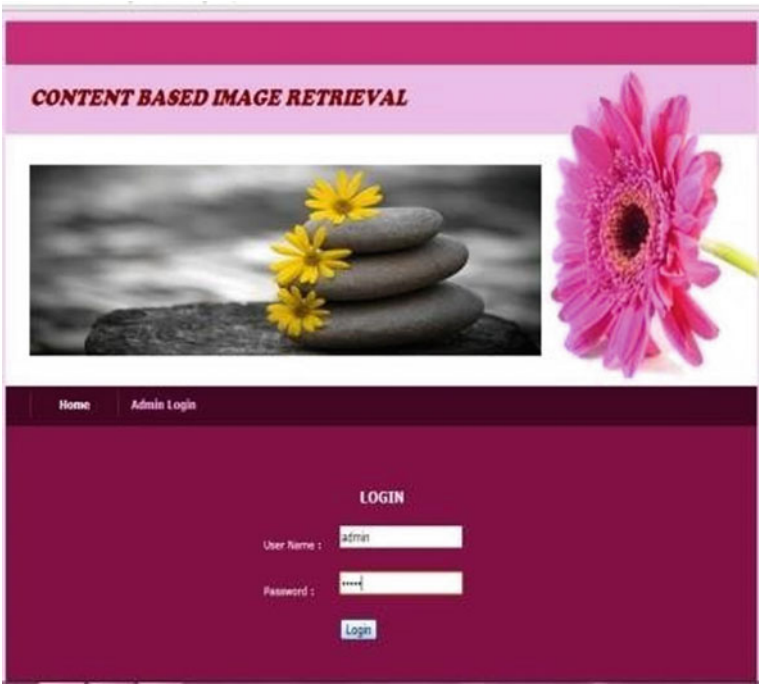

Fig. 4 Text input to search for an image

with the output attained using the other OCR tools. This methodology results can be used for different images with relevant keyword search.

5 Conclusion and Future Scope

To evaluate the text using image retrieval character recognition has played a crucial role in text recognition in scene images. Compared with image, text can be retrieved and image is update in the database. This suggested solution solves the issues that OCR technologies typically have, allowing it to function well even in the presence of complicated background. Even when the text is not aligned either horizontally or vertically, it still produces an accurate result. Font family flexibility has been ensured, coupled with simplicity of adding common directional chain codes of characters in various languages other than English, in a manner similar to that of font size flexibility. The methodology has been tested for English text. According to the results, the suggested text recognition system performs better than the majority of OCR tools that are commercially accessible, and the retrieval system achieves high precision and recall values.

Fig. 5 Image retrieval output

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