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CONTENT-BASED IMAGERETRIEVAL USING QUADRANTS OF IMAGE: A SURVEY

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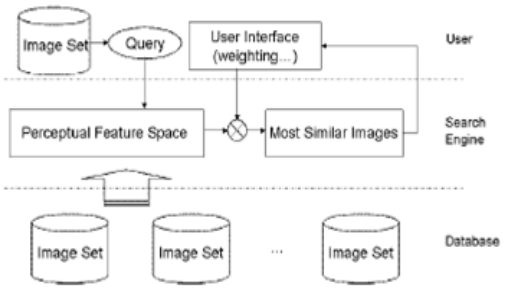
Abstract

The most effective and efficient tool for managing large image database is Image Retrieval. Content Based Image Retrieval (cbir) is strategy for recovering images based on the content of the image. Color, Shape, Texture are said to be Content of an image. Methods/Statistical Analysis: The necessity for Content Based Image Retrieval has been increasing over a decade in different domains such as Data mining, Medical Imaging, Education, Crime prevention etc. It is still an research area where research is going on how to recover the images based on their content. The Content Based Image Retrieval is splited into parts of the image for four regions (quadrant1, quadrant2, quadrant3, quadrant4) of the image.

***Index Terms*— cbir, image retrieval.**

INTRODUCTION

For efficient services in all fields such as government, academics, hospitals, crime prevention, engineering, architecture, journalism, fashion and graphic design use images. Due to the popularity of these types of digital image database becomes huge database, and to search and retrieve required image from the huge database becomes difficult and time consuming. To solve these problems traditionally text-based retrieval is used. In a computer system for browsing, searching and retrieving images from the huge database of digital images retrieval system is used. To search images, a user provides query terms of keyword and the system will return images similar to the query. Text based image retrieval(TBIR) systems consumes more time and sometimes it displays irrelevant images to the user. Content-based image retrieval (CBIR) systems were introduced to address the problems associated with text-based image retrieval. To search and retrieve digital images CBIR uses content of the images. Content-based means that the search analyses the contents of the image not the metadata such as keywords or tags associated with the image. Here the term content means colors, shapes, textures or any other information that derived from the image. In CBIR systems input provide in terms of an image and based on image attribute matching the most similar images from database are retrieved.



A. CBIR ARCHITECTURE

Feature extraction and indexing of image database according to the chosen visual features, which form the perceptual feature space, e.g., color, shape, texture or any combination of the above.

Feature extraction of query image (s).

Matching the query image to the most similar images in the database according to some image-image similarity measure. This forms the search part of the CBIR

User interface and feedback which governs the display of the outcomes, their ranking, the type of the user-interaction with possibility of refining the search through some automatic or manual preference (weighting) scheme, etc.

B.Feature extraction and indexing

Typically, one distinguishes two types of visual features in CBIR: primitive feature and domain specific features.

The former includes color, shape and texture features while the latter includes, for instance, face recognition, finger prints, handwriting, which form a sort of high level image description or meta-object.

Color represents one of the most widely used visual features in CBIR systems. First a color space is used to represent color images. Typically, RGB (red Green Blue) space, where the grey level intensity is represented as the sum of red, green and blue grey level intensities, is widely used in practice. Next, a histogram, -in RGB space, one histogram for each basic color is needed-, is employed to represent the distributions of colors in image. The number of bins of the histogram determines the color quantization. Therefore, the histogram shows the number of pixels whose grey level fails within the range indicated by the corresponding bin. The comparison between images (query image and image in database) is accomplished through the use of some metric which determines the distance or similarity between the two histograms. However, it is straightforward to see that the restriction to distribution of colors only across the whole image without accounting for spatial constraints is insufficient to discriminate between images

LITERATURE SURVEY

A. Content based image retrieval using color feature extraction with knn classification

Author: Deole PA, Longadge R.

Image Retrieval system is an effective and efficient tool for managing large image databases. Content based image retrieval system allows the user to present a query image in order to retrieve images stored in the database according to their similarity to the query image. Content Based Image Retrieval (CBIR) is a technique which uses visual features of image such as color, shape, texture, etc. to search user required image from large image database according to user's requests in the form of a query. In this paper content based image retrieval method is used retrieve query image from large image database using three features such as color, shape, texture etc. The main objective of this paper is classification of image using K-nearest neighbors Algorithm (KNN).

***B*. Content based image retrieval using color and shape features.**

Author: Chaudhari R, AM Patil.

Content-Based Image Retrieval (CBIR) uses the visual contents of an image such as color, shape, texture, and spatial layout to represent and index the image. Active research in CBIR is geared towards the development of methodologies for analyzing, interpreting cataloging and indexing image databases. In addition to their development, efforts are also being made to evaluate the performance of image retrieval systems. The quality of response is heavily dependent on the choice of the method used to generate feature vectors and similarity measure for comparison of features. In this paper we proposed an algorithm which incorporates the advantages of various other algorithms to improve the accuracy and performance of retrieval. The accuracy of color histogram based matching can be increased by using Color Coherence Vector (CCV) for successive refinement. The speed of shape based retrieval can be enhanced by considering approximate shape rather than the exact shape. In addition to this a combination of color and shape based retrieval is also included to improve the accuracy of the result.

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***C*. Content based image retrieval at the end of early years.**

Author: Smeulders AWM, Worring M, Santini S, Gupta A, Jain R.

Presents a review of 200 references in content-based image retrieval. The paper starts with discussing the working conditions of content-based retrieval: patterns of use, types of pictures, the role of semantics, and the sensory gap. Subsequent sections discuss computational steps for image retrieval systems. Step one of the review is image processing for retrieval sorted by color, texture, and local geometry. Features for retrieval are discussed next, sorted by: accumulative and global features, salient points, object and shape features, signs, and structural combinations thereof. Similarity of pictures and objects in pictures is reviewed for each of the feature types, in close connection to the types and means of feedback the user of the systems is capable of giving by interaction. We briefly discuss aspects of system engineering: databases, system architecture, and evaluation. In the concluding section, we present our view on: the driving force of the field, the heritage from computer vision, the influence on computer vision, the role of similarity and of interaction, the need for databases, the problem of evaluation, and the role of the semantic gap.

***D*. Content based image retrieval: Review.**

Author: Shete DS, Chavan MS.

The paper presents a review of different techniques in content-based image retrieval. The paper starts with discussing the fundamental aspects of CBIR. Features for Image Retrieval like color, texture and shape are discussed next. We briefly discuss the similarity measures based on which matches are made and images are retrieved. Another important issue in content-based image retrieval is effective indexing and fast searching of images based on visual features. Dimension reduction and indexing schemes are also discussed. For content-based image retrieval, user interaction with the retrieval system is crucial since flexible formation and modification of queries can only be obtained by involving the user in the retrieval procedure. Finally Relevance feedback is discussed which helps in improving the performance of a CBIR system.

***E.* Image retrieval and re-ranking techniques- A survey.**

Author: Joshi MD, Revati M Deshmukh, Kalashree NH, Wajgi R.

There is a huge amount of research work focusing on the searching, retrieval and re-ranking of images in the image database. The diverse and scattered work in this domain needs to be collected and organized for easy and quick reference. Relating to the above context, this paper gives a brief overview of various image retrieval and re-ranking techniques. Starting with the introduction to existing system the paper proceeds through the core architecture of image harvesting and retrieval system to the different Re-ranking techniques. These techniques are discussed in terms of approaches, methodologies and findings and are listed in tabular form for quick review.

Existing system

Text data present in multimedia contain useful information for automatic annotation, indexing. Extracted information used for recognition of the overlay or scene text from a given video or image. The Extracted text can be used for retrieving the videos and images. In this paper, firstly, we are discussed the different techniques for text extraction from images and videos. Secondly, we are reviewed the techniques for indexing and retrieval of image and videos by using extracted text. Text data present in multimedia viz. video and images contain useful information for automatic annotation, indexing.

A. Issues in the system

In general, the problem of CBIR is the semantic gap between the high-level image and the low-level image. In other words, there is a difference between what image features can distinguish and what people perceives from the image. As shown in Fig. 4, SBIR can be made by extraction of low-level features of images to identify meaningful and interesting regions/objects based on the similar characteristics of the visual features. Then, the object/region features will go into semantic image extraction process to get the semantics description of images to be stored in database. Image retrieval can be queried based on the high-level concept. Query may be done based on a set of textual words that will go into semantic features translator to get the semantic features from the query. The semantic mapping process is used to find the best concept to describe the segmented or clustered region/objects based on the low features. This mapping will be done through supervised or unsupervised learning tools to associate the low level features with object concept and will be annotated with the textual word through image annotation process[1,13]. Semantic content obtained either by textual annotation or by complex inference procedures based on visual content.

PROPOSED SYSTEM

II. In proposed system, the Content Based Image Retrieval was performed using parts of the

III. image for four regions (quadrant1, quadrant2, quadrant 3, quadrant4) of the image. This will indirectly include the space information within it along with the color information. Besides this, retrieval of images from the image database according to the user query image of the images. The average precision is used as a metric to evaluate the performance of the system. Experiments are going to be done successfully implemented on 100 images of Semantics Sensitive Integrated Matching for Picture Libraries using MAT Lab. The performance of the method is compared with other previous methods such as CBIR using shape features and Interactive CBIR which used the same data set and evaluation

method. According to the arrived results, the performance of the proposed system based on CBIR systems was significantly better than other compared methods.

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

1. System : Pentium IV 2.4 GHz.
2. Hard Disk : 40 GB.
3. Monitor : 15 VGA Colour.
4. Ram : 512 Mb.

SOFTWARE REQUIREMENTS

1. Operating system : Windows XP/7.
2. Coding Language : MATLAB
3. Tool : MATLAB R2013

CONCLUSION

The CBIR algorithm, using query by approximate shape, was presented. The idea of the method is based on decomposition of shapes into four segments - primitives, which are described by theirs attributes. Then it is compared with images stored in the database. The algorithm is suitable for queries using input image as well as for human-drawn queries. A complete set of primitives was defined, a new graph constructing procedure was used, the matching algorithm was improved and adopted to complex primitives. The main advantage of our approach is that it may be applied to transformed or partially covered object.

In the future research this will evaluate the approach using greater number of object classes from available image databases, and they also compare the efficiency of their method with more existing state of the art CBIR approaches. More-over, some modification should be added in order to add ability to achieve better matching e.g. to detect mirrored objects. e.g. solving an optimization problem with constraints. Another direction of future research is an efficient storing of objects graphs in the database. Some initial works were performed in, but more advanced research should be done.

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