Survey on Content Based Image & Information Retrieval

S.Singaravelan[1]
Assistant Professor, Department of CSE
P.S.R. Engineering College
Sivakasi, Tamil Nadu

Dr.D.Murugan[2]
Assistant Professor (SG), Department of CSE
Manonmaniam Sundaranar University
Tirunelveli, Tamil Nadu

Abstract— In this paper, we present an complete survey about information and image retrieval process .users are not satisfied with the traditional information retrieval techniques. so nowadays the content based image retrieval are becoming a source of exact and fast retrieval. In this paper the techniques of content based image retrieval are discussed, analyzed and compared. It also introduced the feature like visual descriptor and ontology methods. The suggestion for feature methodology's to over come the difficulties and improve the result performance.

Keywords: Content based image retrieval, Visual descriptor, ontology, Relevance Feedback.

I. INTRODUCTION

In the early years Information retrieval is an area in which the computer user is not—or, at least, should not be —required to be a programmer . the system easy to use is its query language. Called DATAPLUS, the name derives from the system's ability to access data, plus the ability to process data. The systems was implemented early in 1967 [1].Content Based Image Retrieval (CBIR) is any technology that inprinciple helps to organize digital image archives by their visual content. By this definition, anything ranging from an image similarity function to a robust image annotation engine falls under the purview of CBIR The most common form of CBIR is an image search based on visual ,another one is query -by-pictorial example is a relational query language introduced for manipulating queries regarding pictorial relations as well as conventional relations. Queries can also be expressed in terms of pictorial examples through a display terminal.[3]-Content Based Image Retrieval (CBIR) is a technique which uses visual contents, normally called as features, to search images from large scale image databases according to users' requests in the form of a query image. - In the early 2003 some of the rule based approach is introduced for retrieving images under conditions. This approach allows the user to query in a more natural language. Some annotation methodologies are used to store and retrieve the images manually / automatically. The another methodology is ontology – based instructed information organization and retrieval are proposed when applying ontology to it. Based on the ontologies DB , the annotation of unstructured information is obtained.

II. SURVEY ON IR

In the early 1990s, as a result of advances in the Internet and new digital image sensor technologies, the volume of digital images produced by scientific, educational, medical, industrial, and other applications available to users increased dramatically. The difficulties faced by text based retrieval became more and more severe. The efficient management of the rapidly expanding visual information became an urgent problem.- In 1996, Greg Pass Ramin Zabih [2] described for comparing images called histogram refinement, which imposes additional constraints on histogram based matching. Histogram refinement splits the pixels in a given bucket into several classes, based upon some local property. Within a given bucket, only pixels in the same class are compared. Here describe a split histogram called a color coherence vector (CCV), which partitions each histogram bucket based on spatial coherence. - The texture features we use for the segmentation arise from a new approach to texture description and scale selection. Then Yong Rui,Thomas S. Huang and Sharad Mehrotra [2] in 1998 research many visual feature representations have been explored and many system built.

While these research efforts establish the basis of CBIR, the usefulness of the proposed approaches is limited. Specifically, these efforts have relatively ignored two distinct characteristics of CBIR systems: (1) the gap between high level concepts and low level features; (2) subjectivity of human perception of visual content. This research proposes a relevance feedback based interactive retrieval approach, which effectively takes into account the above two characteristics in CBIR. During the retrieval process, the user's high level query and perception subjectivity are captured by dynamically updated weights based on the user's relevant feedback. This approach greatly reduces the user's effort of composing a query and captures the user's information need more precisely CBIR involves the following four parts in system realization: data collection, build up feature database, search in the database, arrange the order and deal with the results of the retrieval

1) Data collection : Using the Internet programs that can collect webs automatically to interview Internet and do the collection of the images on the web site, then it will go over all the other webs through the URL, repeating this process and collecting all the images it has reviewed into the server.

2) Build up feature database : Using index system program do analysis for the collected images and extract the feature information. Currently, the features that use widely involve lowlevel features such as color, texture and so on, the middle level features such as shape etc.

3) Search the Database : The system extract the feature of image that waits for search when user input the image sample that need search, then the search engine will search the suited feature from the database and calculate the similar distance, then find several related webs and images with the minimum similar distance.

4) Process and index the results : After researching Index the image obtained from searching due to the similarity of features, then return the retrieval images to the user and let the user select. If the user is not satisfied with the searching result, he can re-retrieval the image again, and searches database again.

III. APPROACHES ON IR

A. Color-based retrieval

Color feature is the most intuitive and obvious feature of the image, and generally adopt histograms to describe it. Color histograms method has the advantages of speediness, low demand of memory space and not sensitive with the images' changes of the size and rotation, it wins extensive attention consequently.

B. The retrieval based on texture feature

When it refers to the description of the image's texture, we usually adopt texture's statistic feature and structure feature as well as the features that based on special domain are changed into frequency domain.

C. The retrieval based on shape feature

There is three problems need to be solved during the image retrieval that based on shape feature. Firstly, shape usually related to the specifically object in the image, so shape's semantic feature is stronger than texture. [15]

D. The retrieval based on annotation

In the year 2005 papers both keywords annotations and visual features is proposed. Set of statical models are built based on visual features, manually labeled images to represent to used to propagate keywords to other unlabeled images.

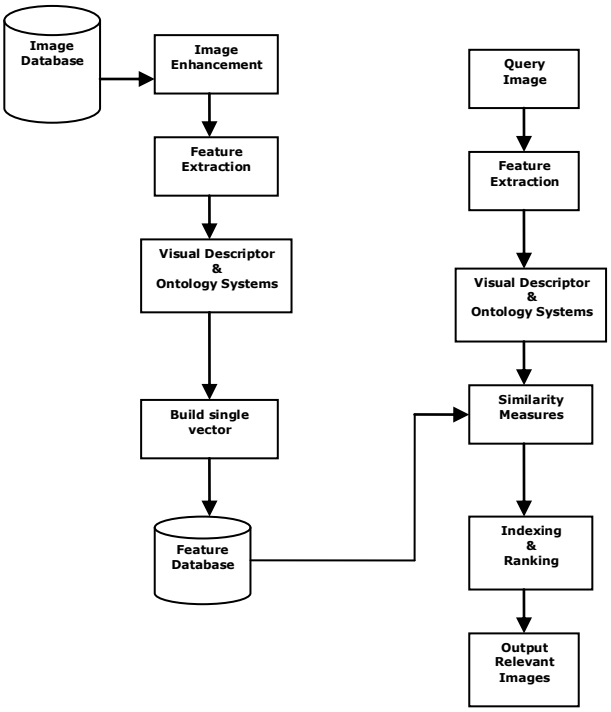
E. The retrieval based on Ontology (visual descriptor)

It is combination of using some special ontology visual descriptors to classify the images and find the query views and object views to compare the databases. Search to classify the resultant images is divided in to relevant group and irrelevant group of images.

F. The retrieval based on Rule-Based

A rule based system consists of a set of IF-THEN rules, a set of facts, and an interpreter controlling the application of the rules, given the facts. The rules and facts are used to convert the high-level query given by the user to a low-level query that can directly use the extracted features.

Block Diagram of CBIR



IV. RECENT WORK ON IR

Support vector machines (SVM) are extensively used to learn from relevance feedback due to their capability of effectively tackling the above difficulties. However, the performances of SVM depend on the tuning of a number of parameters. It is a different approach based on the nearest neighbor paradigm. Each image is ranked according to a relevance score depending on nearest neighbor distances. This approach allows recalling a higher percentage of images with respect to SVM-based techniques [22] there after quotient space granularity computing theory into image retrieval field, clarify the granularity thinking in image retrieval, and a novel image retrieval method is imported. Firstly, aiming at the Different behaviors under different granularities, obtain color features under different granularities, achieve different quotient spaces; secondly, do the attribute combination to the obtained quotient spaces according to the quotient space granularity combination principle; and then realize image retrieval using the combined attribute function.[23] Then a combination of three feature extraction methods namely color, texture, and edge histogram descriptor is reviewed. There is a provision to add new features in future for better retrieval efficiency. Any combination of these methods, which is more appropriate for the application, can be used for retrieval. This is provided through User Interface (UI) in the

form of relevance feedback. The image properties analyzed in this work are by using computer vision and image processing algorithms.

1. Evaluating an emotional response to color images. Its mainly used for the case – base reasoning methodology , emotional evolution of color images values , and also find out fuzzy similarity relational & inter and intra similarities and used for MPEG -7 visual descriptors. [27]
2. 3D Object: The 3D object make their efficient retrieval technology highly desired. Intelligent query methodology , multiple view and representative query view.[28]
3. Relevance Feedback Another methodology is classify the query in text or images to relevance / irrelevance set of images to select the positive images. Reference to retrieve the relevance images from databases.[3]

V. OPEN AREA ON IR

There are various areas to work with for the improvement of the content based image retrieval system. It is already been discussed that the existing techniques may be used to improve the quality of image retrieval and the understanding of user intentions. An approach that combines two different approaches to image retrieval, together with active use of context information and interaction has been proposed. The problem of bridging the semantic gap between high level query which is normally in terms of an example image and low level features of an image such as color, texture, shape and object forced to apply techniques to reduce the semantic gap.

VI. CONCLUSION

In this work, most of systems use color and texture features, few systems use shape feature, and still less use layout features. Ontological Visual descriptor used extensively in various areas to improve the performance of the system and to achieve better results in different applications. Its integrates various features perfectly in content based image retrieval system and reflects the user's subjective requirements, the experiments achieve good performance and demonstrate the efficiency and robustness of system.. This survey also highlighting the significant contributions of content based image & information's Retrieval field.

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