International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

CONTENT BASED IMAGE RETRIVAL USING FEATURE EXTRACTION

[1] Polishetty Sridevi , [2] M.Saraswathi, [3] M.Madhavi, [4] M.Mahesh Chandra, [5] P.Sai Chaitanya

[1]Assistant Professor in Department of CSE Sri Indu College Of Engineering And Technology
Polishetty.sridevi@gmail.com
[2,3,4,5] UG Scholars Department of CSE Sri Indu College Of Engineering And Technology

Abstract

The massive growth of digital technology along with use of internet has increased the use of audio-visual data such as images and videos in many domains like digital museums, commercial use, crime prevention, medical images, remote sensing and so on. With increasing volume of digital data, search and retrieval of relevant images from large datasets in accurate and efficient way is a challenging problem. CBIR combines the contents or features of image like color, texture, edges rather than keywords, labels related to an image. This paper presents systematic literature review of various image retrieval techniques presenting the basic concepts and available methods with their research gaps. In this study, retrieval techniques based on features like HSV, Color Moment, HSV and Color Moment, Gabor Wavelet and Wavelet Transform, Edge Gradient are studied and implemented. An approach is proposed for retrieval based on combination of color, texture and edge features of image. Performance evaluation of studied image retrieval techniques and proposed technique is done using parameters like Sensitivity, Specificity, Retrieval score, Error rate and Accuracy. Experimental results of performance evaluation demonstrate that proposed technique outperforms other techniques.

I INTRODUCTION

A proverb by the Chinese philosopher Confucius "a picture is worth a thousand words" highlights that a picture can express more than words. During last few years, due to improvement in digital image technology, there is a speedy growth of digital content like images and videos available to the user. The large numbers of images has created increasing challenges to computer systems to search and retrieve relevant images efficiently. Humans can perform image retrieval effortlessly and rapidly. Algorithmic description of this task for implementation on computer has been very difficult. To solve this difficulty, text-based and content-based are the two techniques adopted for search and retrieval in an image database. Content based image retrieval (CBIR) also known as Query by image content (QBIC), content based visual image retrieval (CBVIR) is application of computer vision to the image retrieval problem, that is, the problem of searching the digital images in the large databases. The term ‘content based’ means that search will automatically extracted features

by analyzing actual content of image for retrieving images from a collection rather than depending on human inputted metadata such as keywords, labels etc. Implementation of a CBIR system using one content feature doesn't give sufficient retrieval accuracy [13]. To overcome this problem, we combine multiple features for the image like color, texture, and edge. The objective is to work on collection of images and retrieve similar images based on features in response to pictorial queries.

II LITERATURE SURVEY

The pathway taken into account to develop the Review Model for literature modeling is: Conduct the organized review of existing techniques for CBIR, pinpoint the research gaps of study and key areas of research.

Research questions Research questions are the building blocks for the scientists to plan and conduct any research; therefore it is fundamental to frame such questions. Key questions encountered during our study are listed below:

what are existing techniques, tools, algorithms for CBIR What are the existing gaps in existing literature Which are the key areas of research in the field of CBIR

Key Research Areas: CBIR has become an active and fast research area in image retrieval. A wide range of possible research areas for CBIR technology are like web based image search engines can return better results based on content of images than metadata. Other applications are Criminal investigations like face recognition and finger print recognition, medical imaging measurement of internal organs ,Journalism and advertising, Trademark databases, Fashion, graphic design, Architectural engineering design ,Art galleries, museums, archaeology and remote sensing etc

III EXISTING SYSTEM

Image retrieval is defined as a method of browsing, searching and retrieving images from a large database of digital images. Image retrieval has been a very active research area since the 1970s. Image retrieval methods can be classified into two categories as: text-based image retrieval (TBIR) and content based image retrieval (CBIR).

Text Based Image Retrieval

Traditionally, text based image retrieval also known as concept based image retrieval is the most common retrieval system, where the search is based on annotation of images. TBIR searches the database for the similar text, keywords, tags, labels surrounding the image as given in the query string and system will return images similar to the query string. The commonly used TBIR system is Google Images. It is sometimes difficult to express the whole visual content of images in words and TBIR may end up in producing irrelevant results

IV PROPOSED SYSTEM

Content Based Image Retrieval

Image Retrieval Methods Text Based Image Retrieval Content Based Image Retrieval The alternative way of searching and overcoming the limitations imposed by TBIR is content based image retrieval system (CBIR). The term CBIR was coined by Kato in 1992 in his research article "Database architecture for content base image retrieval", for the automatic retrieval of the images from a database based on the color and the shape [1] .The tagline for CBIR can also be given as "search images as images."Advantages of CBIR over TBIR: x Features such as color, texture and shape information of images are extracted automatically. x No need of field specialists for adding labels, keywords, tags with images. x Description of image in text form is not required so there is not any language ambiguity or language barrier. x It is an automated approach without any human intervention, so effect of manual error is less. x It gives more accurate results

Need of Feature Extraction

- It is the main unit of CBIR that is used to retrieve from the database the most similar images to the query image.
- It separates the visual information from the image and stores them in the form of feature vectors in a feature database.
- The accuracy of CBIR system depends on appropriate selection of features.
- Thus, the main goal of feature extraction is to obtain the most relevant information from the original data and represent that information in a lower dimensionality space.
- ***Feature Extraction*:** The proposed system design is given in two phases.
- ***Training Phase:*** Feature extraction applied for image database is a backend process which is independent from user extraction. The extracted features are smaller than actual image and then they are stored as feature database in the form of matrix for similarity measures later on. The collection of feature vectors is termed as feature database of the images in the database.
- ***Testing Phase:*** This phase is also known as front end starts when user gives a specific query request by giving an example image. Then, features of query image are also extracted in same manner as database image features are extracted and stored as a feature vector. Then similarity is measured based on chosen distance metrics and based on least distance set of most similar images is obtained as result

V IMPLEMENTATION

Features of image used for Retrieval

A 'feature' means anything that is localized, meaningful and detectable. Information about color or texture or shape which is extracted from an image

is known as image features. These Features are used as a signature for the image.

Retrieval of image on the basis of color features

Color is the most widely used visual content for image retrieval. It is relatively robust to background complication and independent of image size and orientation. In this case image feature identifies the proportion of pixels of specific color or colors within an image. Color space consists of three dimensional spaces and color is used as a vector in it. Color spaces are required for description of color based retrieval of image. Mostly RGB, HSV, HSI, YCbCr. Various Color descriptors are Color Histogram, Color Coherence Vector, Color Correlogram, and Color Moments.

Retrieval of image on the basis of texture features

Texture is another important property of image which is used in pattern recognition and computer vision. The identification of specific textures in an image is achieved primarily by modeling texture as a two-dimensional gray level variation. Textures are characterized by differences in brightness with high frequencies in the image spectrum. The ability to match on texture similarity can often be useful in distinguishing between areas of images with similar color (such as sky and sea, or leaves and grass). Texture representation methods can be classified into Structural and Statistical categories. Structural methods are applied to textures that are very regular. Statistical methods, includes characterizing texture by the statistical distribution of the image intensity. Various texture descriptors are GLCM, Gabor Transform and Tamura Features, Local Binary pattern.

***Retrieval of image on the basis of shape features*:**

Shapes are often determined first by applying segmentation (parts) or edge detection to an image. Edge and Region detections are important parts for the shape feature extraction. These edges and blobs are points or regions in the image that are either brighter or darker than the surrounding. Several methods are used for shape-based image retrieval, which involve different kind of image filtering and image transformations.

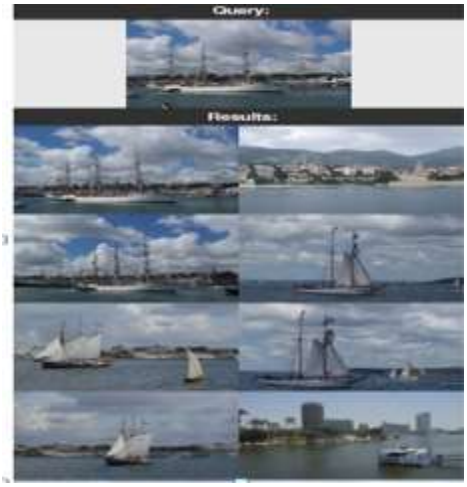
Need of Multiple Features

Color, texture, and shape are some image features that can be used to

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

describe an image. However, no particular feature is most suitable for retrieving all types of images. Color images need color features that are most suitable to describe them. Images containing visual patterns, surface properties, and scene need texture features to describe them. In reality, no one particular feature can describe an image completely. Many images have to be described by more than one feature. We are using multiple features together for CBIR.

VI RESULTS



VII CONCLUSION

the techniques for CBIR are reviewed presenting their achievements and gaps. Performance evaluation of little state–of- the –art image retrieval techniques and proposed technique is done using parameters like Sensitivity, Specificity, Retrieval score, Error rate and Accuracy. Experimental results on 10 categories of images each with 40 images demonstrate that proposed technique along Manhattan distance as similarity measure with average accuracy 0.844 outperforms other techniques. The future work includes database population and the exploration of the other features of the images in order to enhance the retrieval process.

REFERENCES

[1] Sandhya R. Shindeet al., "Experiments on Content Based Image Classification using Color Feature Extraction",IEEE, 2015.

[2] Ammar Huneiti et al., "Content Based Image Retrieval Using SOM and DWT",Journal of Software Engineering and Applications, 2015.

[3] Deepak John etal., "Content Based Image Retrieval using HSV-Color Histogram and GLCM", International Journal of Advance Research in Computer Science and Management Studies,Vol.2, 2014.

[4]Princy Shaktawat and V K Govindan, "Novel Scheme for Image Retrieval Using Combination of Color-Texture Features",International Journal of C computer Trends and Technology (IJCTT),Vol. 21,2015.

[5] Aditi Giri and Yogesh Kumar Meena, "Content based image retrieval using integration of color and texture features", International Journal ofAdvanced Research in Computer Engineering & Technology ,Vol. 3,2014

[6] Ashwani Kr. et al., "Survey on Content-based Image Retrieval Texture Analysis with Applications", International Journal of Signal Processing, Image Processing and Pattern Recognition, Vol. 7, 2014

[7] K. Haridas et al.,"Well-Organized Content based Image Retrieval System in RGB Color Histogram, Tamura Texture and Gabor Feature", International Journal of Advanced Research in Computer and Communication Engineering,Vol. 3, 2014.

[8]Chi Zhang and Lei Huang, "Content-Based Image Retrieval Using Multiple Features", Journal of Computing and Information Technology,2014.

[9] Agarwal et al., "Content Based Image Retrieval using Color Detection and Discrete Wavelet Transform", International Conference on issues and challenges in Intelligence Computing techniques, IEEE, 2014.

[10]Thanh-Nghi Doan et al., "Classification: Fast Feature Extraction, Multicodebook Approach and Multi-core SVM Training", Beckman Institute for Advanced Science and Technology University of Illinois, Urbana, 2014.

[11]Saadet al., "Visual Feature Extraction for Content-Based Retrieval" IJASR, 2013.

[12]Zhang, Liningetal., "Asemantic subspacelearning method to exploit relevance feedback log data for image retrieval."Computational Intelligence and Data Mining (CIDM), IEEE, 2013.

[13] Bodhke, "Content Based Image Retrieval System", Journal of Signal And Image Processing, 2012.

[14] Majid Fakheri et al., "Gabor wavelets and GVF for feature extraction in efficient

contentbased color and texture images retrieval", IEEE, 2011.

[15] Zhi- chun Huang et al., "content based image retrieval using color moment and Gabor texture feature", Proceedings of the Ninth International Conference on Machine Learning and Cybernetics, Qingdao, 2010.