A SURVEY IN NEED OF IMAGE MINING TECHNIQUES

A.Hema[1], E.Annasaro[2]

PhD. Research scholar, Manonmaniam Sundaranar University, Tirunelveli,   India[1]

Department of MCA, S. N. R. Sons College of Arts and Science, Coimbatore, India[2]

ABSTRACT - Increasing use of World Wide Web and communication channels like mobile networking has increased the number of images used throughout the world. Continuing advancements in both hardware and software coupled with higher end image processing and image vision tools, have made it possible to store huge amount of images. This increase in number of images and image databases has necessiated 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. The main aim of this paper is to present a survey of the various techniques used for image mining applications like image retrieval, Matching, Pattern recognition given by different researchers.

Keywords: Image mining, Data mining, Feature extraction, image matching, image retrieval.

I. INTRODUCTION

Image mining is an interdisciplinary endeavour that draws upon expertise in various fields like computer vision, image retrieval, matching and pattern recognition. Some methods allow image mining to have two different approaches. First method extracts images from image databases or collection of images. Second method mines a combination of associated alphanumeric data and collection of images. Research in Image mining can be broadly classified in two main directions (1) Domain-specific applications (2) General applications. Both are used to extract most relevant image feature and later to generate image patterns. A vast amount of image data is generated in daily life and in various fields like medical, astronomy, sports and all kinds of photographic images. It is still at the experimental stage and growing field of research. Lack of understanding in the research issues of image mining is the obstacle to rapid progress [1].

Image data plays vital role in every aspect of the systems like business, hospitals, engineering and so on. Image mining normally deals with the study and development of new technologies that allow easy analysis and interpretation of the images. Image mining is not only the simple fact of recovering relevant images but is the innovation of image patterns that are noteworthy in a given collection of images. The establishment of image mining system is frequently an complicated process because it implies joining diverse techniques ranging from image retrieval and indexing schemes up to data mining and pattern recognition.

This paper presents many different views about retrieval, matching, pattern recognition which will be very useful

while extracting features like shape, color, size, texture, imprint etc from large image databases. The number of

features required to represent an image can be very huge. Using all available features to recognize objects can suffer from curse dimensionality. Feature selection and extraction is the pre-processing step of image mining. Main issues in analyzing images is the effective identification of features and another one is extracting them[3].

Shaikh Nikhat Fatma[18] describes the importance of Image mining in which images can be retrieved according to some requirement specifications. Image retrieval can have logical features like objects of a given type or individual objects or persons using edge detection techniques to retrieve the specified image.

II. LITERATURE REVIEW

An image retrieval system is a Computer system for Searching, browsing and retrieving images from large databases. Chary *et al.* [4] described the retrieval of images within a large image collection based on color projections and different mathematical approaches which are introduced and applied for retrieval of images. Images are sub grouping using threshold values, they considered R,G,B color combinations for retrieval of images, which are implemented and results are included, and through results it is observed that it obtaining efficient results comparatively to the previous one and existing. This method provides the best solution in large image set compared with total of 10000 images with different categories. All suggested methods are helpful to perform the good results and based on query images

required images retrieved from the database. So best one is to select the combinations of colors mean with median and standard deviation, expect best performs and good results.

Daniele Cerra and Mihai Datcu[17]explains that almost ten seconds would be needed to process five RGB images of size 256x256, in the case of images datasets but cause a major drawback for compression-based analysis in real applications, where usually medium-to-large datasets are involved. To avoid that problem another author Vamsidhar Enireddy[7]says that the digital medical images are stored in large databases for easy accessibility and Content based image retrieval (CBIR) is used to retrieve diagnostic cases similar to the query medical image. Haar wavelet is used for image compression without losses. Edge and texture features are extracted from the medical compressed medical images using Sobel edge detector and Gabor transforms respectively. The classification accuracy of retrieval is evaluated using Naïve Bayes and Support Vector Machine. The digital medical images are stored in large databases for easy accessibility and Content based image retrieval (CBIR) is used to retrieve diagnostic cases similar to the query medical image. CBIR uses algorithms to extract relevant features from the image, on presenting a query image. CBIR retrieves images from the database based on the features such as color, texture, edge and shape in the images which are automatically extracted by CBIR systems.

Stanchev [12], using image mining in image retrieval, described a new method for image retrieval using high level semantic features. It is based on extraction of low level color, shape and texture characteristics and their conversion into high level semantic features using fuzzy production rules, derived with the help of an image mining technique. Dempster-Shafer theory of evidence is applied to obtain a list of structures containing information for the image high level semantic features. Johannes Itten theory is adopted for acquiring high level color features. The main advantage of this method is the possibility of retrieval using high level image semantic features. After the full system realization it will be able to obtain statistic characteristics about the usefulness of the suggested method.

Aswini kumar mohanty, Sukanta kumar swain ,Pratap kumar champati ,Saroj kumar lenka[9] says that , before proceeding to the first stage preprocessing it is necessary to improve the quality of image and make the feature extraction phase as an easier and reliable one. Feature extraction methodologies analyze objects and images to extract the most prominent features that are representative of the various classes of objects. Features are used as inputs to classifiers that assign them to the class that they represent. M.Janani, Dr.R.Manicka Chezian[5],proves that Image mining is a vital technique which is used to mine knowledge from image. The

function of image mining is to retrieve similar image from huge database. The development of the Image Mining technique is based on the Content Based Image Retrieval system. Color, texture, pattern, shape of objects and their layouts and locations within the image, etc are the basis of the Visual Content of the Image and they are indexed. Especially for the image retrieval, it is not a single image but a list of images ranked by their similarities with the query image. Many similarity measures have been developed for image retrieval based on empirical estimates of the distribution of features in recent years. Different similarity measures will affect retrieval performances of an image retrieval system significantly.

Matching is the technique to find existence of a pattern within a given description. Image matching is an important application requirement in the field of image mining. A lot of matching techniques have been developed till today and still research for developing an optimized matching technique is going on. Most commonly used matching technique is nearest neighborhood technique which is an important technique used in applications where objects to be matched are represented as n-dimensional vectors. Other matching techniques used are least square method, coefficient of correlation technique, relational graph isomorphism technique, approximate nearest neighbor technique and matching using simulated annealing etc. all of these matching techniques have their own advantages and disadvantages. So, the matching technique should be chosen depending upon the application area in which it is to be applied.

A.W.GRuen [13] says that The Adaptive Least Squares Correlation is a very potent and flexible technique for all kinds of data matching problems. Here its application to image matching is outlined. It allows for simultaneous radiometric corrections and local geometrical image shaping, whereby the system parameters are automatically assessed, corrected, and thus optimized during the least squares iterations. The various tools of least squares estimation can be favourably utilized for the assessment of the correlation quality. Furthermore, the system allows for stabilization and improvement of the correlation procedure through the simultaneous consideration of geometrical constraints, e.g. the collinearity condition. Finally, the adaptive least squares correlation can be applied to a great variety of data matching problem, which focuses mainly on its utilization for image matching. The technique shows a number of attractive features, such as, high matching accuracy, monitoring of quality, precision and reliability measures are readily available.

Walia and Suneja [10] describes an efficient matching technique should find similarity or dissimilarity in lesser time period. On the other hand, Salam and Rodrigues [3] explains that research progress in image mining still has

a big room for improvement, particularly in multimedia images. One of the greatest challenges is devising an effective automatic recognition and categorization. Peaks measure are essential for recognizing objects of different shapes, as the shape outline itself is insufficient. A larger number of peaks or higher readings occur where there is a significant change in shape, such as a sharp corner or a curve. Different shapes will be grouped accordingly. The system is capable of grouping new objects, that are objects that do not belong to any existing category by putting it into a new category. The research was carried out to test the capability ofproducing an automatic shape recognition system by mining relevant image features. From the experiments and the results it showed that the method is capable of producing a generic automatic shape recognition system that is invariant to rotation, translation, size and to a certain degree of distortion.

S.Balan and T.Devi[6] explains that the retrieval process represents a visual query to the system and extracts the images based on the user request such mechanism referred to as query-by-example and used to compare some similarity metrics to compare query and target images. The greater demand for retrieval and management tools for visual data and visual information is a more capable medium of conveying ideas and is more closely related to human percept ion of the real world. In Text based Image Retrieval images are indexed and retrieved based on the descriptions such as their size, type, date and time of capture, identify of owner, keywords or some text description of the image. This is often called description based or text based image retrieval process .In Query Based Image Retrieval query image can be extracting the visual features and can be compared to find matches with the indices of the images stored in the database. These features are used to retrieve the similar images from the image database.

III. CONCLUSION

This paper compared many of the proposed techniques in image mining used by the earlier researchers in the image retrieval, matching, pattern recognition etc, which is used while extracting features of the images like shape, color, size ,texture, imprint etc. Because, Image mining presents special characteristics due to the richness of the data that an image can show. Effective evaluation of the results of image mining by content requires, that the user point of view is used on the performance parameters. The query image is compared to each of database images to determine whether they are equivalent or not by comparing with all features. 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 the imprint which is one of the important notable feature of the image [8].

REFERENCES

[1] T.Y.Gajjar,N.C.Chauhan ,"A review on image mining frameworks and techniques" International journal of computer science and information technologies,vol3(3),2012.

[2] *Nirupama Tiwari,sneha ashtputre,kiran tomar." Image mining-A pattern for information retrieval"(2012) .*

[3] R.A. Salam, M.A. Rodrigues,"Mining Image Features in an Automatic Two- Dimensional Shape Recognition System" International Journal of Applied Mathematics and Computer Sciences Volume 2 Number 1.

[4*] R.Venkata Ramana Chary, Dr.D.Rajya Lakshmi and Dr. K.V.N Sunitha "feature extraction methods for color image similarity"Advanced Computing: An International Journal (ACIJ), Vol.3, No.2, March 2012.*

[5] M.Janani, Dr.R.Manicka Chezian,"A Survey On Content Based Image Retrieval System International Journal of Advanced Research in Computer Engineering & Technology Volume 1, Issue 5, July 2012.

[6] *S.Balan and T.Devi,"Design and Development of an Algorithm for Image Clustering   In Textile Image Retrieval Using Color Descriptors", International Journal of Computer Science, Engineering and Applications (IJCSEA) Vol.2, No.3, June 2012.*

[7] Vamsidhar Enireddy, Kiran Kumar Reddi ,"A Data Mining Approach for Compressed Medical Image Retrieval ", International Journal of Computer Applications (0975 – 887) Volume 52– No.5, August 2012.

[8] *Young-Beom,Lee,UnsangPark,Anil K.Jain,Seong-Whan Lee,"Pill-ID: Matching and retrieval of drug pill images",journal,www.elsevier.com/locate/patrec,pattern recognition Letters (2011).*

[9] Aswini kumar mohanty, Sukanta kumar swain ,Pratap kumar champati ,Saroj kumar lenka,"IJCSI International Journal of Computer Science Issues, Vol. 8, Issue 5, No 3, September 2011 ISSN (Online): 1694-0814.

[10]   *Dr. Ekta Walia, Anu Suneja,"A Conceptual Study on Image Matching Techniques", global Journal of Computer Science and Technology Vol. 10 Issue 12 (Ver. 1.0) October 2010 Page83.*

[11] Dr.V.Mohan, A.Kannan," Color Image Classification and Retrieval Using Image   mining Techniques" et. Al. / International Journal of Engineering Science and Technology Vol. 2(5), 2010, 1014-1020.

[12] Peter-Stanchev,"Using image mining in image retrieval",IASTEDconference,"Computer science and technology"(2003).

[13*] AW GRUEN,"Adaptive least squares   correlation:A powerful image matching technique".*

[14] Jonathan J. Hull, John Cullen, andMark Peairs,"Document Image Matching   Techniques", Symposium on Document Image Understanding Technology, Annapolis, MD, April 30 - May 2, 1997, pp. 31-35.

[15] *Patricia G. Foschi, Deepak Kolippakkam*, Huan Liu and Amit Mandvikar," Feature Extraction for Image Mining".*

[16] Lindi J. Quackenbush,"A Review of Techniques for Extracting Linear Features from Imagery".

[17*] Daniele Cerra* and Mihai Datcu ,"A Fast Compression-based Similarity Measure with   Applications to   Content-based Image Retrieval".*

[18] Shaikh Nikhat Fatma ," Image Mining Method and Frameworks",International Journal of Computational Engineering Research (ijceronline.com)Vol. Issue. 8.

 [19] Mahip M.Bartere, Dr.Prashant,R.Deshmukh," An efficient Technique using Text & Content Base Image Mining Technique for Image Retrieval ".