https://doi.org/10.46335/IJIES.2022.7.9.23 **e-ISSN: 2456-3463**
Vol. 7, No. 9, 2022, PP. 114-118
International Journal of Innovations in Engineering and Science, www.ijies.net

Comparative Study of Content Based Image Retrieval

Ms. Priyarani Lalit Rai [1], Prof. Nikhil Khandar [2]

[1] Student, [2] Assistant Professor, Department of Master of Computer Application
G H Raisoni Institute of Engineering & Technology, Nagpur, India, 440016

priyarani.rai.mca@ghrietn.raisoni.net

***Received on**: 11 June ,2022* ***Revised on**: 08 August ,2022,* ***Published on**: 10 August,2022*

Abstract- *It consists of reacquiring the most visually analogous images to a given query image from a huge database of Digital Images. As digital technology is expanding day by day with use of internet has increased. And therefore, use of audio-visual data similar as images and videos in many domains. Content-Based Image Retrieval (CBIR) aggregates image assets such as color, textures, and edges rather than the captions associated with the image. In CBIR system, we had used RGB, HSV, HSI for color, canny edge detection for edge and GLCM Gabor Transform for texture. The main process flow in CBIR system is to insert the query image and then systemwill start its work to extract features.*

Keywords- ***CBIR, Image, Retrieval, Feature Extraction, Content-Based***

I-INTRODUCTION

As we know text content lower information as compare to image and it's only a reason utmost of the data has been converted and store in the form of image, as we can say in digital form. Data recovery is a lengthy process because the main task is to extract the data. As data is adding day by day in digital image the storehouse is reached to the maximum position to which typical image hunt and reclamation became a difficult job. To make the work flow better i.e., text-based job and the content-based-technique are used for hunt and reclamation [1],[4]. The main aim is to make work on collection of images and find out same image. The reclamation methods are free browsing, content-based reclamation.

In free browsing system we've to go through the process of database till needed sample is matched and generated. Another system is content based system which is also termed as text-based retrieval system. Also, in content-based retrieval system the hunt of specific content of the data is carried forward and also main image is created. Current technologies use conceptual and content-based image retrieval approaches, and attaching predefined data to unstructured data files is a difficult task because it requires human intervention and is time consuming. Content-based image retrieval system, considering feature.

And features can be defined as an attribute that can capture a definite visual property of an image. In general, images characteristics fall into three categories: color characteristics, texture characteristics, and shape characteristics [3].

The most generally habituated ways of feature extract are block transaction coding, edge detection, applying transform matrices, histogram SOM (Self Organizing Map) and LDA (Latent Dirichlet Allocation).

Methods used are: RGB shape is the method used to extract color. Luv shape is used to remove the gradient of color dominance. Gabor Wavelets Transform is used in texture extract. It is also used in the shape edge detection the canny edge detection, pratt edge detection, etc.

CBIR uproots the functionality of each image stored in the database and compares it to the functionality of query images. This involves two steps.

- Object extraction is the process of extracting the features of an image as far as they can be determined
- Matching is an alternative step in matching these

https://doi.org/10.46335/IJIES.2022.7.9.23 e-ISSN: 2456-3463
Vol. 7, No. 9, 2022, PP. 114-118
International Journal of Innovations in Engineering and Science, www.ijies.net

features to produce visually similar results.

• To make the work flow better i.e., text-based job and the content-based technique are used for search and retrieval.

II- EXISTING SYSTEM

There are many existing methods for extract image features according to their color, shape, texture from a very large database.

1. S. Rubini [2] proposed a CBIR system that uses multiple histograms to explain spatial information in color. Color spatial information was capture by recursively splitting the image into two rectangular sub-images.
2. A novel method has been developed by S. Manoharan to describe spatial features more accurately. This model was not a variation of scale, rotation, or movement [6].
3. A new technology for generalized image retrieval based on semantic content was provided and proposed by S. Nandagopalan [5].
4. Kratika Arora and Ashwani Kumar [9], described relevance-response methods for image retrieval. Relevance feedback (RF) is an effective content- based image retrieval (CBIR) method.
5. Tejashri N. Phalke and Anil A. Patil [10], proposed a new content-based image retrieval method that uses color and texture information to achieve higher search efficiency. First, the image moves from the RGB space to the opposite color space, and the individuality of the color content of the image became the space.

III-LITERATURE REVIEW

A proposed approaches to restoration is based on a combination of color, texture and shape characteristics of an image. Evaluate the performance of researched and proposed techniques based on parameters such as sensitivity, specificity, recovery score, error rate, and accuracy. In this image retrieval system extract is based on the averaging method clustering image, revised averaging algorithm to reduce the complexity of extract and efficiency [5]. The Gabor Wavelets transform mainly combines the features of the image and its attenuation into separate scale and orientation with various filters to minimize the unwanted image information. In this methodology only the color feature gets extract from image and at first image is divided into 16 equal sized segments after that the average value of each color component is considered into account. Rather than the transform and averaging techniques an unsupervised learning technique is also used i.e. First the Self-Organizing Map (SOM) and then LDA.

In [11] the author proposed three image indexing techniques for retrieval of images. The query procedure algorithm is used to find the features of the query image. The Indexing procedure is used to find the features of the database images and Finally Semantic Indexing algorithm is used to find the features of the collected images. In this approaches medical images are used as a database which is available in google search engine.

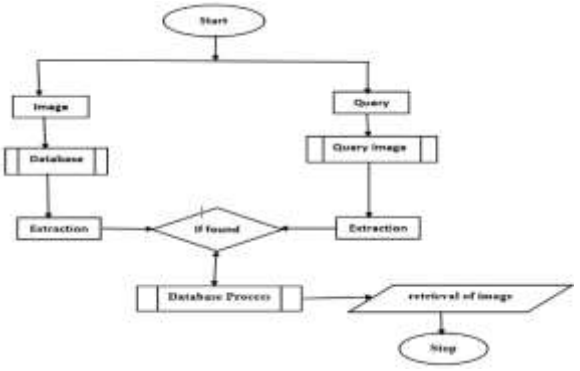
IV-METHODOLOGY

The CBIR approaches is one of the features that exists in vision techniques related to image acquisition. It is used to identify the specific image that the user needs, based on the content provided as input. This research paper contains a method which is introduced to extract the feature if image by CBIR [1]. The main purpose and goal are to find the content of the image, for example color texture and image. But most of time this method of CBIR take more time than usual to find and retrieve image. So that's what my new approaches was suggested. Images are interpreted based on keywords or metadata in the database.

In most cases, images cannot be interpreted and represented with accurately keywords. It proposed two different types of IR (Image Search) systems: Use text and use content. There are mainly two types of image restoration techniques. The first is texture based, which is done manually, we can also say it is done by humans, and the second is content based, also known as CBIR. In CBIR image color, texture and shape are three most important parameters which describe the image. In color image contain visuals patterns, surface properties, for texture scene is need to describe an image completely. Simple flow chart for the proposed system is shown below:

CBIR Architecture:

https://doi.org/10.46335/IJIES.2022.7.9.23 e-ISSN: 2456-3463
Vol. 7, No. 9, 2022, PP. 114-118
International Journal of Innovations in Engineering and Science, www.ijies.net



The main concept of CBIR is divided into several parts. CBIR is used to property organize the large number of generated images which are required.

The CBIR techniques has several steps as follows:

1.Create database

For creating and to store image as input and according to that images system will find out similar images.

2. Query image

This is the image input that we feed the system as input.

3.Feature Extraction

Extraction is the most important feature because image from query and database image like color, texture and shape etc.

4. Feature Matching

Feature matching measures the content of the query image and the database image and it is verified. And the input image gets the corresponding images from the database.

5. Retrieve Image

CBIR will fetch the images based on the content of the image feature.

Color feature

The color feature is considered one of the most important. This feature identifies operations on a specific color pixel in the image. This basically called Three dimensional and also in vector form color image have normally like RGB, YCBCR, HSV, HSI etc., various color descriptors based on the color coherence vector, color histogram, color moments and color correlogram [8],[9].

Color come in different descriptors and they mainly based on color consistency vectors, color histograms, color moments, and color correlation histograms.

Texture feature

It is an important feature of CBIR which is used to recognition pattern. It is considered a pivotal feature in Computer Vision (CV) because of its existence in many real images, that's why it is often used in image retrieval and pattern recognition. Texture similarity can be used to distinguish between a region of an image. E.g., texture is like sky, leaves and sea etc.

Shape feature

Shape is one of the low-level characteristics for identifying objects. Shape mining can be done based on an area or a boundary. It is nothing but an edge in the edges of an image that shows a sudden change in the pixel density of the images [7]. There are many detection techniques also known as edge detection techniques, intelligent edge detection techniques, Prewitt and Robert edge detection techniques.

Segmentation

In this study, we used superpixel segmentation to make the system more robust. To avoid images fragmentation, the input images is initially smoothed with a Gaussian filter of a different scale [8]. In addition, an improved ISODATA clustering algorithm with dynamically defined parameters was proposed to cluster images pixels into different regions. To exclude these local regions, a strategic association region is also presented [15]. The final test results show that the proposed approaches can effectively separate the objects in a general-purpose images from thebackground.

V-OVERVIEW OF PROPOSED SYSTEM

The proposed Content Based Image Retrieval system is evaluated by querying various images, and the efficiency of the proposed system is evaluated using the accuracy recall of the obtained results.

- User will provide the query which will be aformation as input image and then visual content is made
- Then vector depicts take place which will help in extracting the image features.
- Afterwards similarity matching take place.

https://doi.org/10.46335/IJIES.2022.7.9.23 e-ISSN: 2456-3463
Vol. 7, No. 9, 2022, PP. 114-118
International Journal of Innovations in Engineering and Science, www.ijies.net

- And if found, then comparison of both willbe indexed.

In this way, query formation and images from databases are indexed and retrieved. It may be clearer from the diagram below.

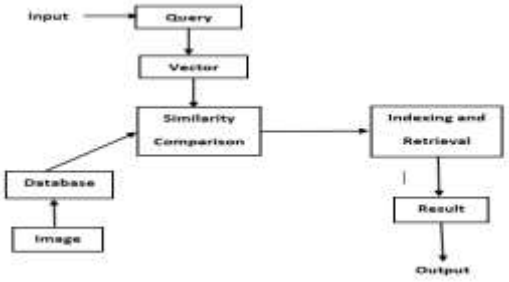


Fig. System Architecture

VI- APPLICATIONS OF CBIR

The CBIR technology used in applications such as:

- Security issue
- Forensic
- Natural

CBIR in security

The CBIR system helps developed biometric security systems. This paper defines how to capture an image of a biometric security system using three properties such as color, texture, and shape. This system not only accelerates speed of biometric systems, but also provides better sensitivity position for image retrieval. Let us take the example of field. As we all know as day-by-day number of airfields are adding. And due to this league security is the most important and for that main part is played CCTV and her only CBIR is used to break the security issue [9].

Due to the proliferation of airport and back-end surveillance equipment, the amount of surveillance data (or images) is too large to process. To improve the video surveillance system at this airport, the CBIR method can be used appropriately to improve the security system. Field security can be further accelerated by the CBIR system described in the Distributed Index Schema Article D-MVP.

CBIR in forensic

Forensic scientists need to search for specific images taken with certain types of cameras and used on websites to support legitimate behavior against child pornography and the like. This publication develops operations on these criteria via an image search system to retrieve images based on the CBIR compressed images. As moment generation follows the trends of tattoo's as they represent something and they play the important role and have the deep meaning and that's a reason people make the tattoos. The traditional ways aren't suitable for this operation, so there's a need of applications to search the tattoo images. Anil Jain explained the idea of this type of forensic research through the concept of matching and acquiring tattoo images [9].

This acquisition is achieve via a Tattoo ID-based matching system. Image features are derived using Scale-Invariant Feature Transformation (SIFT). So, the platoon of forensics needs the system which help them to retrieve the tattoo by this and the issue can be
solve and this can help to break the issue and for that CBIR is used in forensic.

CBIR in Natural Image Retrieval

It focuses on developing content- based image retrieval applications with natural-color images using striking structural histograms. This operation retrieves a natural image from a large database. The sparse matrix model is fixed with a striking image structure in terms of color and edge data for accurately and fast image retrievals and Natural retrievals content image of trees, beast, flowers, nature, etc.

It is because natural retrievals also needs to store in database and retrieve and occasionally it's also used for some type searching and sorting [9]. Author Pakruddin. B, Imran Ulla khan [15] provides a CBIR system that supports encrypted image recovery applications. Use encrypted JPEG images for secure medical image retrieval.

VII- RESULT AND CONCLUSION

Result

Whenever user give some query then CBIR take place and the feature us extracted in database compared with feature image in database. The six-color feature take place and being compared with it, both color and texture are compared. And therefore, feature of color is being extracted and store in database and then help is searching and sorting.

As stated above the color feature are extracted and stored in the database the feature of the query images is also extracted and the feature of the query is compared with the database image.

Conclusion

There are two exits' approaches for searching and to retrieve image. First one is done by manually which is called concept based or text-based image. And second one is called Content Based Image Retrieval (CBIR) which is used to overcome for limitations of text based and that's a reason CBIR is used.

Previous Content Based Image Retrieval systems included the extraction of low-level features such as color, texture, shape, and similarity measurements for image comparison. But later different image features and grouping techniques are used to recovery the image.

REFERENCES

[1] *M. E. J. Wood, N. W. Campbell, and B. T. Thomas, "Iterative refinement by relevance feedback in content- based digital image retrieval," In ACM Multimedia 98, pages 13–20, ACM, 1998.*

[2] *Rubini, R. Divya, G. Divyalakshmi and Mr. T.M. Senthil Ganesan "Content- Based Image Retrieval(CBIR)," International Research Journal of Engineering and Technology (IRJET).*

[3] *Dr. Fuhui Long, Dr. Hongjiang Zhang and Prof. David Dagan Feng "Fundamentals of Content-Based Image Retrieval."*

[4] *S. Nandagopalan, Dr. B. S. Adiga, and N. Deepak, "A Universal Model for Content-Based Image Retrieval," World Academy of Science, Engineering and Technology, Vol.2, Issue3, 2008-10-29.*

[5] *Jisha.K.P. P, Thusnavis Bella Marry. I, Dr. A. Vasuki, "An Image Retrieve Al Technique Based on Texture.*

[6] *S. Manoharan, S. Sathappan, "A Novel Approaches for Content Based Image Retrieval Using Hybrid Filter Techniques",8th International Conference on Computer Science & Education (ICCSE 2013), April 26-28, 2013, Colombo, Sri Lanka6*

[7] *Diego Valsesia Giulio Coluccia, Tiziano Bianchi and Enrico Magli, "Large scale image retrieval based on compressed camera identification", IEEE transaction on multimedia, VOL-17, No-9, Sep 2015.*

[8] *Anil K. Jain, Rang Jin and Jung-Eun Lee, "Tattoo image matching and retrieval" IEEE computer society, May 2012.*

[9] *Kratika Arora, Ashwani Kumar, "A Comparative Study on Content Based Image Retrieval Methods" International Journal of Latest Technology in Engineering, Management & Applied Science (IJLTEMAS) Volume VI, Issue IV, April 2017*

[10] *Tejashri N. Phalke, Anil A. Patil, "Content-Based Image Retrieval using Color and Texture"7th International Conference on Recent Trends in Engineering, Science & Management,1 April 2017*

[11] *Achmad Nizar Hidayanto, Elisabeth Martha Koeanan, "Journey on Image Clustering Based on Color Composition" World Academy of Science, Engineering and Technology International Journal of Computer and Information Engineering Vol:4, No:7, 2010*

[12] *Monika Daga, Kamlesh Lakhwani "A Novel Content Based Image Retrieval Implemented by NSA of AIS" International Journal of Scientific & Technology Research volume 2, issue 7, July 2013*

[13] *Amit Singh, Parag Sohoni, Manoj Kumar "A Review of Different Content Based Image Retrieval Techniques" International Journal of Engineering Research and General Science Volume 2, Issue 5, August – September 2014*

[14] *A.P. Nilawar and C.G. Dethe "Content Based Image Retrieval with integrated Techniques" International Journal on Emerging Technologies.*

[15] *Pakruddin. B, Imran Ulla khan "A Survey on Content Based Image Retrieval by Using Various Features" International Journal of Advanced Research in Computer and Communication Engineering, Vol. 5, Special Issue 2, October 2016.*

[16] *D. Latha, Dr. Y. Jacob Vetha Raj "Different Types of CBIR Applications: A Survey" International Journal for Research in Engineering Application & Management (IJREAM), Vol-03, Issue-11, Feb 2018.*