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Methods of Image Retrieval Based Cloud

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Abstract*: *Content Based Image Retrieval (CBIR) introduces for the time being the most used system allowing detecting the visual features of images by using processing techniques due to the challenges of recovering photos depending on the text.The essential mechanism of content based image retrieval system is analysis picture information with low-level feature of an image, including colour, texture, determining edges, that has stages which includes the stage of classification of images, then the stage of extracting features and the stage of finding similar images and finally, evaluating the system and according to the technique or techniques used in each stage from stages of content based image retrieval system to increase the accuracy and speed of recovery for images ,together can using advantages cloud computing, which can provide a number of integrated computer services without being restricted to local resources, which include storage space, processing capabilities, expansion, flexibility and other various services through the Internet and deal with cloud through the platform as a user interface such as Microsoft Azure , Google Cloud platform, Amazon Web Services and others. In this paper, an analytical study of many CBIR techniques in terms of their behavior, feature extraction and work on Cloud Computing. All these techniques have their own avails as well as certain limitations, that means, there is not a one technique that suits superior all sorts of user's needs,but using of advantages of cloud increase the improvement of performance. The focus be on the technique (features of Principle Component Analysis (PCA)) with advantages of Cloud Computing as a helpful way to extraction the features as shown in the results derived from the comparison.

Keywords* : *Cloud Computing, Content-based Image Retrieval , feature extraction, PCA technique.

I. INTRODUCTION

The access CBIR systems are one of the challenging areas of search engines in terms of retrieval accuracy and speed [1]. The first search engines were text depended to retrieve image, which required labeled using precise keywords, manual annotation to entire image groups. And so on, this manual job is not possible for large image databases. CBIR has emerged as an alternative to overcoming the challenges faced by text to retrieve image [2].It is known to everyone that there can be more of users dealing with data, which can be with the pattern of digital pictures, this better for sharing, understanding and store the information.

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Exact image recovery can be indicated to that requires images to be matched exactly; whereas while related images retrieval is depended on contents. The main goal of an images retreival systems is to find images similarties, that according to applications in the current era. For this purpose, many researchers have innovated many methods depended on various criteria to get more exact results with speed for retrieval performance [3]. Significant amount of research is completed and some of these still going on to develop an efficient real time CBIR techniques [1] for the demand to retrieve the required image from image database systems such as geographicmaps, medical images, images obtaining by Camera, microscope, telescope, agricultural field photos, paintings, industrial parts drawings, space photos, etc., which share by many professional collections [4].The use of new technologies such as Cloud Computing is effective in successful implementation. Cloud Computing is Transferring the process from the user's machine to servers on the Internet, and storing the user's files to be accessed from any place and any machine", the software to become services, and the user's computer to be just a interface [5].

The aim of this paper, present an analytical study of many CBIR systems in terms of their behavior, feature extraction and performance evaluation .The achievement of this aim be through discussion of the different techniques that used for CBIR systems and determine the performance of each technique within the different stages of CBIR systems.

One of the objectives of this paper is to focus on the PCA technique which is one of the most important of techniques which deal with very large datasets in image processing where provids best performance from where of high accuracy and recovery of values with less calculation complexity through advantages of cloud computing. this has produced great interest lately in strong variants of PCA that make to one of the most powerful research baselines related methods [6].

The arranging of paper is next one: INTRODUCTION: Describes the ways used to retrieve images, their use fields, what reached researchers and then touched on the possibility of taking advantage of cloud computing in image retrieve in addition, determination the objective of this study. METHODOLOGY OF THIS WORK: methodology of this paper.TYPES OF DIFFERENT METHODS OF IMAGE RETRIEVAL:includes definition of the image retrieval system and types,definition of CBIR system and methods and steps,in addition definition the advantages of cloud computing.LITERATURE REVIEW: contain an analytical study of many CBIR systems in terms of their behavior, feature extraction and performance. PCA FOR FEATURES EXTRACTION: Determine the objectives of PCA and arithmetic description of the PCA algorithm.

RESULT AND

DISCUSSION: Discuss the performances of methods that have been included in table-I from where of their advantages with some restrictions. Determinations the advantages of PCA technique to image retrieve through use the benefits of Cloud Computing.CONCLUSION: Include the deductive for analyze techniques that use for images retrieve. References: contain references titles.

II. METHODOLOGY OF THIS WORK

The methodology that is used in the formulation of this research paper is shown in Fig. 1.

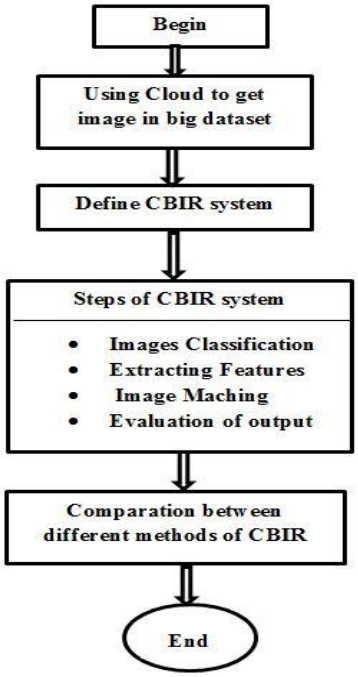


Fig. 1.Methodology of this work

III. TYPES OF DIFFERENT METHODS OF IMAGE RETRIEVAL

An Image Retrieval (IR) system is a system which allows user to browse, search and retrieve digital images. They are mainly two types –Text based and CBIR [7].CBIR is the technique that use retrieve images based on their content. The basic thought of CBIR in analysis picture information with low-level feature of an image, including colour, texture, shape, distance relationship between objects, etc., and set feature vector for the image as an indicator [8].CBIR along with the cloud technology provides with a better storage and easy retrieval capabilities. The CBIR technology is enhanced with the incorporation of the Cloud Computing Aspect as it improves the processing time and promotes for a speedy retrieval in a centralized way. As it offers better flexibility to the storage of tons of images, it improves the retrieval speed. This results in improved scalability for future applications to be inherited with minimal changes to the existing system, thus Cloud Computing ensures minimal or no change in the structure of storage and retrieval in spite of the changing technologies at place. Cloud computing, thus, proves to provide a virtual environment to the user's bulk data eliminating the extra overheads of the computer and the expenses over mainframe servers for data storage [9].CBIR system includs the methods below:

A. Retrieval depends on Color feature

The color is more sensitively and obviously feature in the image, and is usually described by histograms graphics. The color graph method has the advantages of speed, less space for memory and without sensitivity to images.

B. Retrieval based on Texture feature

Generally, it depend the statistical feature of the material and the structure feature in addition to the features based on the spatial field being changed to a frequency band. Homogeneous texture descriptor describes an accurate statistic distribute texture of image. It enables classification of images in high resolution and is used for similarity recovery applications [10].

C. Retrieval based on Shape feature

Object shape can consist of one or more areas, and it may also have perforations. Extraction feature of the shape using the Edge graph descriptor. An edge can be described as image positions where the local density changes in a specific direction. The higher the intensity, the more evidence there is of an advantage in this position. Edges are classified into five kinds: vertically, horizontally, 45 diagonally, 135 diagonally and no directionally [11].

The CBIR system has following steps:

- Images Classification: Classification is the supervision and unsupervision for categorize images to groups. In supervision classifier, give a group of of labeled images and the problem is the labeling of newly encountered images but without labeling. In a non-supervised classification is to
- group a certain group of unlabeled images into meaningful groups according to the image content without prior knowledgement [12].
- Extracting Features: Features of dataset images and features of query image is extracted depended on different features of image as color, texture, shape features.
- Image Maching: Measuring the similarity between the test image and the images saving in databases depended on distances like Manhattan, mahalanbis, chi square and other distances. The features closest to the query image are checked, and the image retrieval according to those features.
- Evaluation of output: Depended on specific criteria such as sensitivitly,precision and speed of retrieval images as shown in Fig.2 [13].

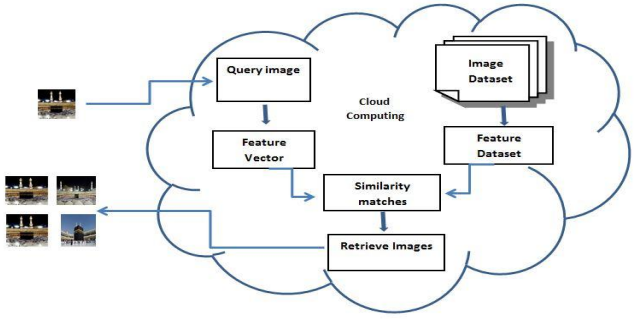


Fig.2.Overall design of contentbased Image Retrieval through Cloud Computing [13]

IV. LITERATURE REVIEW

There are several techniques have reported in CBIR system which have used for retrieve image depended on features color, texture, and shape in an image.Some of these techniques have been done on cloud computing:

R.Madana M., Dr.A.Rama M. R., 2015, suggested a technique that could be used to retrieve images relevant from a wide range of discriminative images by approach segmentation for extraction the various features by used Discrete wavelet transform technique (DWT) that as storage in vectors and then are compared with feature vectors in query image for sort in descending order, by used K-Means classification and Euclidean Distance.CBIR is an application built on the cloud by using Windows Azure was a parallel process issue where a big databases of images must be run to arrange them depended on similarity to the query image [14].

Hatem Aouadi, et al., 2015, proposed a Linear Discriminant Analysis (LDA) technique to re-rank results and hence improve retrieval accurate.They applied the work in two stages: global level to representation the entire document that contain the image, and local level to representation the paragraph that contain an image [15].

Anas F. Ahmed, 2016, The proposal presented a comparative study of human face recognition using two feature extraction techniques: PCA and Linear LDA. Describe of the participating of each eigenfaces in Representing the entry face image to deal with eigenfaces as the basis for mapping the facial image. The drop vector used in the typical pattern recognition method to determine which pre-defined facial categories, if any. The Ωk class can be determined by averaging the results of the eigenface representation on a tiny number of facial images one person. rating was done by comparing the projection vectors of the training face images with the vectors of the put face image projection. The comparing was depended on the Euclidean distance both the facial categories and the input face image. The idea was to find the facial category k that reduces the Euclidean distance as shown in equation (1) [16]:

$$Ek = \left| \Omega - \Omega k \right| \qquad (1)$$

Where Ω: recipe the contribute of each eigenface and Ωk: a vector recipe the kth faces class.

Sun Ting and Geng Guohua, 2016, developed a self-learning Deep Neural Network technique (DBN),and depended on stages :output, input, and self-learning method in network structure to gain global method for image retrieval. The precision and the concourse of the suggested retrieval technique was checked via tests this research was summarized within the following paragraphs [17]:

- The model system

DBN visible stage node for p, the first layer of hideaway stage nodes is q, the input of the train of image for X, pixels for m×p, visual stage node offset b=(b1,b2 ,…,bq), the offset of the first hidden stage nodes, w denotes weight, when visual input stage node training of specimens xi = (x1, x2,…,xi), the first to congruous to the output of the hidden stage nodes as shown in equation(2).

$$h_j = \sum_{i=1}^{p} x_i . w_{ij} + b_j \qquad (2)$$

Every value of visible and hidden nodes among the values of whole has energy. Energy functions as shown in equation (3).

$$E(x,h) = -\sum_{i=1}^{p}\sum_{j=1}^{q} x_i w_{ij} h_j - \sum_{i=1}^{p} a_i x_i - \sum_{j=1}^{q} b_j h_j \qquad (3)$$

- Extraction of the Image Spatial Information

To solve the target issue is all the value of the optical node and the value of accumulated energy of hidden nodes, reducing energy, the solution process is complicated, now the most common way w to enter probability.Combined with entropy. Free energy as shown in equation (4)

$$FreeEnergy(x) = -\ln \sum_{h} e^{-E(x,h)} \qquad (4)$$

P(X) written as shown in equation (5)

$$p(x) = \frac{e^{FreeEnergy(x)}}{Z} \qquad (5)$$

- The results image information

The equation (5) logarithmically on two sides as shown in equation (6)

$$\ln p(x) = -FreeEnergy(x) - \ln z \qquad (6)$$

Or as shown in equation (7)

$$H_X(p) = \sum_{X} p(x) FreeEnergy(x) + \ln z \qquad (7)$$

In the left part of the equation for the image input visual phase of the data entropy, , the equation lnz is fixed per second on the right, o The probability remains, after the average entropy function is associated with the probability distribution only x, it has nothing to do with the position of the distance x. It has a space information system after the results of convergence. After the rotation of the sample translation image compared to the original image of the sample, although the position of the area has changed, but the overall image content is fixed, the ratio of each pixel is fixed, the sample image information is a confirmed entropy, and the system's free energy also remains unchanged[17].

Dandan L., et al., 2017, suggested a safe CBIR diagram depended on an EDH-CBIR coded difference.

Initially, the image owner calculates arrangement variance or disturbance matrices for RGB ingredients and encoded them by replacing the value and mixing with the location. The encoded images are then laoded to the cloud server that extracted encoded graphs of differences as vectors for the image feature. To find like images, the test image is encoded by image users as the owner of the image, and the query feature vector is extracted by the server in the cloud. The Euclidean distance both the test feature vector and the image feature vector is computed to measure similar images [18].

Manisha Verma, Balasubramanian Raman, 2017, Suggest a new technique using LNDP for local features. The traditional Local Binary Pattren (LBP) converts each image pixels into a binary pattern depended on its relation to neighboring pixels. The suggested feature descriptor differs from the LBP because it

converts the reciprocal relationship of all adjacent pixels into a binary pattern. Both LBP and LNDP are complementary to each other because they extract various information using local pixels intensity [19].

S.Selvam and S.Thabasu Kannan, 2017, proposed a technique to combine the genetic algorithm (GA) with the HARP aggregation algorithm to improve system retrieval accuracy for less computational time and to restore the relevant image and possible resolution using CBIR. The efficiency of the system is improved by looking at the image filter for the purpose of calculating the similarity i.e. not taking into account the entire database images. The filter image resides in the same group as the query image, as the usefulness of the assembly process clearly demonstrated retrieval accuracy [20].

Dr.K.Meenakshisundaram,G.Vijaiprabhu,2017, proposed technique (Center Symmetric Local Binary Pattern CSLBP) was depended on retrieval of images using the feature, the extraction was depended on features such as power, contrast, homogeneity. Separately calculated threshold value saved in the features in databases where the feature matching was done via the Euclidean Distance used to calculate the distance for two images [12].

Mr. Yogen Mahesh Lohite, Prof. Sushant J. Pawar,2017, A new technique of image retrieval is proposed depended on a combination of image colour, texture and shape features with the SVM Workbook to improve results. The performance of the suggested system is evaluated using parameters such as sensitivity, specificity, degree of restoration, error ratio and precision [13].

Prof.S.Govindaraju, Dr.G.P.Ramesh Kumar, 2017, proposed a new method (Hierarchy and Fuzzy C-Means HFCM) to collect unsupervised images using continuous probabilistic models and principles of information theory. Image compilation relates to contentbased image recovery systems. It enables the implementation of efficient recall algorithms and the creation of an easy user interface for the database [10].

Intedhar S. Nasir, 2018, used a statistical approach to find the amount of intersection between features represented by statistical models. One of these measures is Bhattacharyya Distance (BD), which is used after extracting the texture features of both the query and the filtered image. This measure achieves very good results compared to other conventional CBIR systems. The specified scale represents the degree of variation in a limited standard form of the range [0 ... 1]. Thus, the result is very understandable about the difference between the filter samples [21].

Umesh D. Dixit and M. S. Shirdhonkar, 2018, presented a technique to retrieve documents from a person's database

based on a face photo. The technique included three stages: (1) face image detection from the test document (2) extracting facial image features (3) retrieving all documents containing the face image like to the test document. The proposed technology extends the concept of the GLCM array to include colour images for

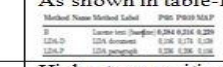
feature extraction and Mahalanopis distance to find a similarity scale [22].

Dr.Mamta M, et al. ,2018, suggested technique to solve the problem of efficient image retrieval through a huge storage space on Cloud Computing. In Several guides from the photos, finding the required photo may cost a lot of time and effort. It is easy to search for an image through its feature (Kerkre conversion for global features and wavelet conversion for local features) and thus list short pictures, among many in the database, thus reducing the cost of calculation. An image can be better remembered by its contents such as its color, shape, texture. That making is a key to a list of images possessing similar features out of a group of images in the database [9].

Sidi A. Mahmoudi, et al. 2019, proposed efficiently combining SIFT and SURF technologies that allowed the extraction and matching of image features that improved the image recovery process. The proposed technologies were applied to the CPU and also adapted to take full advantage of the force of GPUs. Their platform was provided with reacting web solutions that provide users with access to image recovery, testing and evaluation technologies [23].

Vo Thi H. Tuyet, et al., 2019, suggested new technology (Shearlet) to retrieve content-based medical images. It consists two steps: the offline job and the online job in the medicinal image databases (1) they extracted the features of local objects from the medicinal images in the shearlet field. Then they discover the circumference of the object in the photos with an active contour model. (2) They undertake an online mission to retrieve content-based images in the databases. Their system receives the test image and shows what looks like images compared to the similarity with the information gathered from the first step [24].Table-I shows an analysis of the mentioned of image retrieve systems above based on the techniques is used.

Table- I: Analysis of Retrieval System based on techniques

Researcher #Name	Research #Name and #Date	Techniques are used	Performance
R.Madana.M, Dr.A.R. M.R .[14]	CCBIR:A Cloud Based Implementation of Content Based Image Retrieval,2015	Discrete wavelet transform As extraction features, K-Mean and Euclidean As cluster	Average Percentage of Accuracy of CBIR:82.5%
Hatem A., M. T. K., M. B. J. [15]	An LDA Topic Model Adaptation for Context-Based Image Retrieval,2015	LDA topic model for whole document and paragraph	As shown in table-II 
Anas F. A. [16]	A COMPARATIVE STUDY OF HUMAN FACES RECOGNITION USING PRINCIPLE COMPONENTS ANALYSIS AND LINEAR DISCRIMINANT ANALYSIS TECHNIQUES,2016	Principle Components Analysis (PCA), and Linear Discriminant Analysis (LDA) for extraction features, Euclidean Distance As classifier	Highest recognition rates PCA:94.027% ORL database, 77.68% UMIST database 64.978%JAFFE database -LDA: 95.981% ORL, 79.69% UMIST, 67.052% JAFFE
Sun T. , G. G. [17]	Image Retrieval Method for Deep Neural Network, 2016	Deep Neural Network(DNN) based on local ,global features	algorithm had a high recognation probability[17]
Dandan L., J. S. , Z. X. and X. S. [18]	A Content-Based Image Retrieval Scheme Using an EncryptedDifference Histogram in Cloud computing,2017	encrypted difference histogram (EDH-CBIR) for extract features	Block size: 50*50,100*100,500*500 mAP%: 50.761,51.436 , 48.013
Manisha V., B. R. [19]	Local neighborhood difference pattren : A new feature descriptor for natural and texture image retrieval,2017	local binary pattern (LBP) and local neighborhood difference pattern(LNDP)for local feature	Corel-10k precision:42.81, recall: 17.01 MIT database precision: 70.24,Recall:39
S.Selvam , S.T. K. [20]	A New Architecture for Image Retrieval Optimization with HARP Algorithm,2017	Genetic Algorithm (GA), HARP technique As clustering	average precision 89.1% and average recall 69.8%
Dr.K.Meenaks hisundaram, G. V. [12]	AN ENHANCED CENTER SYMMETRIC LOCAL BINARY PATTERN TECHNIQUE FOR IMAGE RETRIEVALUSING EUCLIDEAN DISTANCE,2017	Center Symmetric Local Binary Pattern (CSLBP) As classifier, Euclidean Distance for maching	accuracy % 77.87
Mr.Yogen M. L., Prof.S. J. P. [13]	A novel method for Content Based Image retrieval using Local features and SVM classifier,2017	(SVM)Support Vector Machine As classifier	average accuracy 0.844
Prof.S.Govindaraju, Dr.G.P.R K. [10]	Content Based Image Retrieval Using Hierarchical and Fuzzy C-Means Clustering,2017	Hybrid Fuzzy C-Means HFCM Algorithm Asclustering	Precision:0.81 ,min precision :0.69 ,recall :0.71,min recall: 0.31
Intedhar S. N. [21]	A New Approach for Content Based Image Retrieval Using Statistical Metrics,2018	Histogram As enhancement and features extraction, Bhattacharyya Distance (BC) As matching	As shown in the table-III 
Umesh D. D. and M. S. S. [22]	Face-based Document Image Retrieval System,2018	(GLCM),for extract feature Mahalanobis distance for mach	Mean Average Precision is 82.66%
Dr.Mamta M, S. M. , S. T. [9]	Effectiveness of Saas Cloud Model For Retrieving Images From CBIR System,2018	Kerkre transform for global features and wavelet transform for local features on Cloud Computing	efficient performance, scalability and min cost, a flexible system that operate huge amount of data [9]
Sidi A.,M. A. B., El W. D. , S. M. M. B. [23]	Cloud-Based Image Retrieval Using GPU Platforms,2019	SIFT and SURF techniques As classifier	As shown in ig.3 
Vo Thi H. T., N. M. H. , Ph. B. Q., N. T. S., N. T. [24]	Adaptive Content-Based Medical Image Retrieval Based On Local Features Extraction In Shearlet Domain,2019	shearlet transform for extract local features	Precision:69.326% Recall:81.233%

V. PCA FOR FEATURE EXTRACTION

PCA is a useful tool for reducing data dimensionality while retaining essential information for manipulated datasets. The main objective is to transform original data to a smaller set of uncorrelated variables [25]. It is a procedure has used an orthogonal transformation to change a set of variables related to M into a set of unrelated K are called as principal components /eigen vectors (K< M) as shown in the algorithm-I and fig.4 [26].

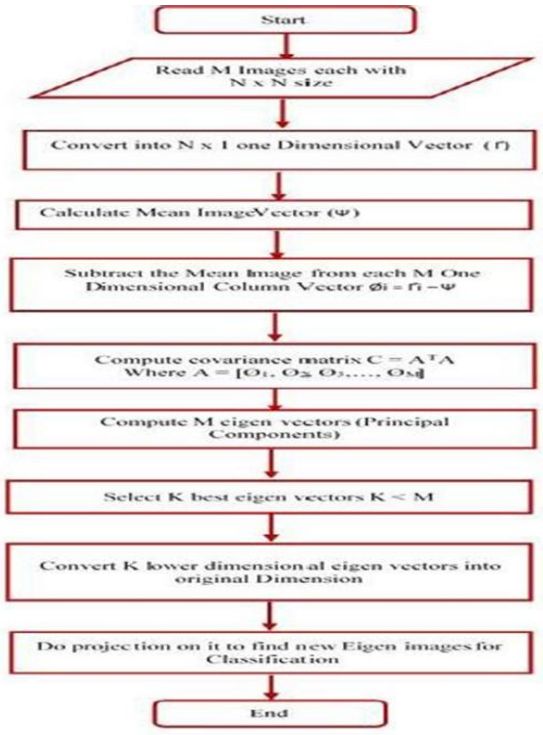


Fig.4. Flowchart of Principal Component Analysis [26]

Principal Component Analysis Algorithm-1
Inputs: a collection of images visualized as a set of coordinates in a high-dimensional (n) dataset.
Outputs: results a lower dimensional image a shadow (eigen images) of given m pictures when viewed from its most informative points.

Begin
I. Conversion each m input images (I1,I2,…,Im) of size N X N into N X 1 one dimensional column vectors (Γ1, Γ2…, Γm)
II. Normalize N X 1 column vector. That means all the common features from every M images are removed so that each image has only unique features.
A. Calculation an average/mean image vector (Ψ)
B. Subtraction the average/mean image vector (Ψ) from each M one dimensional column vectors Γ (i.e.) Normalized Image Vectors Øi = Γi – Ψ
III.Calculation K significant Eigen Vectors (principal components / axes) and eigen values (variance) from a covariance with reduced dimensionality Eigen vectors => Determines the direction of the new feature space Eigen Values =>Locates the magnitude/variance of the data along the novel feature space Calculate the Covariance matrix C = ATA
Where A = [Ø1, Ø2, Ø3,…, ØM] Dimension of A = N2 M & AT = M N2
Hence C = (MN2) (N2 M) => (M M)
C. Generate M eigen vectors (PC)
IV. Selection K best Eigen Vectors K < M
V. Conversion lower dimensional K eigen vectors into original

VI. RESULT AND DISCUSSION

Let us discuss performance of the methods above. Some of these techniques based on Cloud Computing.Extract the various features in the image by used discrete wavelet transform technique (DWT) that can be stored in vectors. K-Means algorithm and Euclidean distance used for aggregation. The system works on virtual machines available in data centers, which are running platform Azure, there is a significant enhance the fast of the calculation, Azure supplys a set of Worker roles that can perform parallel calculations and thus reduce overall processing speed, the following nonfunctional features are also provided (fault toleration, scalability, and security) [14]. The results appear a marked enhancement over the standard text recovery way by reclassification using the locally-applied LDA pattern. Although this technique outperforms content-based approaches, it may fail when the search keywords do not match the textual content of many documents containing related images. Increase working is required on the LDA subject pattern, especially in selecting appropriate parameters [15]. Two techniques are used to extract feature PCA as well as LDA, are examined to recognize the faces that conclude that LDA supplys more ratio than PCA,while PCA extracts features to best characterize face images than LDA [16]. Depended on the DNN, it has an big degree of matching and remember more than the (GA).if learning more features then the characteristics will be more complexity, therefore best results can be obtained for images retrieval. nevertheless, the training group is petite, and the avails of DNN are not very clear, but in variety experiments, the image features that ought be retrieval are more complexity, the images databases becomes complex, so the DNN is occasion for the using mentioned [17]. Reduce user account burden by transmitting, extracting and indexing jobs to a cloud server. When the owner of the image loads the encoded image database to the cloud server, the cloud server extracts graphs directly from the encoded images as image features [18]. LBP and LNDP features are collected to extract more of the information that can get using local density differences. performance shows accuracy in retrieval of images and enhancement by this method.[19]. Aggregation GA with HARP to enhance the retrieval accuracy of the technique. Gaining lower arithmetic time and retrieving relate and accurate image is potential by use CBIR. Efficiency improvement system by looking at the candidate images for the purpose of calculating similarity ie not taking into account the entire database images. The filter image resides in the same group as the query image, as the usefulness of the assembly process clearly demonstrated retrieval accuracy [20]. The CSLBP technique yields better retrieval results with a precision of 77.87% by comparion to the othertechniques such as local binary mode, the improved local binary pattern and the local multi-block binary pattern [12]. SVM technique is evaluated using sensitivity,the specificity, recovery degree, error rate and precision. Test results on 10 categories of images each with 50 images demonstrate that this technique combined with 11 distance parameters as a measurement to similar and precision of 0.844 is superior to other [13]. use of HFCM leads to a higher recovery value when compared to using the K-means technique.It has the shared benfit of both fuzzy and possiblistic techniques.
[10].The adopted metric Bhattacharyya Coefficient (BC), is set to find the intersection between the given two histograms. The metric reflects fine modification for the results when compared to other traditional CBIR systems and the result value become more accurate. This modification could combine with other techniques to enhance such computer vision applications like object detection, object recognition, and image classification [21]. The results of Grey Level Co-occurrence Matrix technique best than includsive Haralick features linked with GLCM but it is limited with own database [22]. Kerkre technique retrieves images from big databases of images that depended the content through advantages Cloud Computing where proves to be an efficient way for storage, thus eradicating the use of standalone systems where the system results in efficient performance, scalability and minimized cost, thus building flexible system. [9]. The platform offers to users simple access based on various techniques like SIFT and SURF descriptors without the required to set up the environment or setup anything with less effort in pre-processing and configuration ,the cloud depended CPU apps and GPU app are scalable, which means it could be used even with a large databases of multimedia documents. The results showed: accuracy, performance improvement in terms of calculation time as a result of parallel GPU utilization, reducing power consumption. But it needs a plan to exploit deep learning ways to improve the quality of training and conformity. [23]. Medicinal images stored in the database have a constant form and site. That an important basis. Additionally,
the digitization of the separate shearlet that are performed in the field of frequency and multidirectional and multidirectional analysis is item of the optimum options for the features extracted from the test image. [24].

Through the analytical study of the techniques above show that the performances of all thesetechniques have their own avails as well as certain limitations. PCA technique is one of the important of these techniques which deal with very large datasets in image processing, where appears the better performance from where increasing the accurate and the retrieval with lesser computational complexity through advantages of cloud computing that resulting in increase in applications scalability with more flexible and available as show in Table-IV and Table-.

Table- IV: Advantages and limitation of Techniques

Technique	Advantages	Limitations
(DWT+ K-Mean) on Cloud Computing	Significant enhance the fast of the calculation. Azure supplys a set of Worker roles that can perform parallel calculations and thus reduce processing speed and provide(fault toleration, scalability, security)	Performance is limited by using Cloud Computing
LDA topic	results appear a marked enhancement over the standard text recovery way by reclassification using the locally-applied LDA pattern	It may fail when the search keywords do not match the textual content of many documents containing related images.
PCA,LDA	LDA supplys more ratio than PCA PCA extracts features to best characterize face images than LDA	LDA is limited with database And more complex than PCA
DNN	an big degree of matching and remember more than the (GA).if learning more features then the characteristics will be more of complexity, therefore best results be obtained for images retrieval.	training group is small, and the avails of DNN are not very clear
(EDH-CBIR) on Cloud Computing	Reduce user account burden by transmitting, extracting and indexing jobs to a cloud server.	Performance is limited by using Cloud Computing
(LBP+LNDP)	(LBP+LNDP) has been observed using precision and recall graphs and compared with some local models. Evaluation measures clearly demonstrate that technique outperforms other in terms of accuracy.	
GA, HARP	Aggregation GA with HARP to enhance the retrieval accuracy of the technique. Gaining lower arithmetic time and retrieving relate and accurate image is potential by use CBIR.	Need to publish feature choices and use other distance measures to enhance overall results.
CSLBP	The CSLBP yields better retrieval results with a precision of 77.87%	
SVM	Test results on 10 categories of images each with 50 images demonstrate that this technique combined with 11 distance parameters as a measurement to similar and precision of 0.844 is superior to other	it is limited with database
HFCM	HFCM leads to a higher recovery value when compared to using the K-means technique.	
(Histogram +BC)	The metric reflects fine modification for the results when compared to other traditional CBIR systems This modification could combine with other to enhance such computer vision applications like object detection, object recognition, and image classification	
GLCM	The results of Grey Level Co-occurrence Matrix method better than including Haralick features	it is limited with database
Kerkre on Cloud Computing	Kerkre technique that retrieves images from large set of distinct images, based on the content for efficient retrieval and with an enormous storage capability using the cloud computing technology.	Performance is limited by using Cloud Computing
SIFT , SURF on Cloud computing	accuracy, performance improvement in terms of calculation time as a result of parallel GPU utilization, reducing power consumption	it needs plan to exploit deep learning ways to improve the quality of training and conformity
shearlet	Shearlet that are performed in the field of frequency and multidirectional and multidirectional analysis is one of the optimum options for the features extracted from the test image.	In future work ,not very clear about the depth and shape of objects in the query image

Table- V: Analysis Performance of Techniques

Technique	Speed	Accuracy	Complexity	Large dataset
(DWT+ K-Mean) on Cloud Computing	√	82.5	-	√
LDA topic	-	√	-	×
PCA , LDA	√	Highest recognition rates PCA:94.027% ORLdatabase, 77.68% UMIST database 64.978%JAFFE database -LDA: 95.981% ORL, 79.69%UMIST, 67.052% JAFFE	× √	√ ×
DNN	√	√	√	×
(EDH-CBIR) on Cloud Computing	√	Block size: 50*50,100*100,500*500 mAP%:50.761 ,51.436 , 48.013	-	√
(LBP+LNDP)	Core-10k, recall: 17.01, recall:39	Corel-10k,precision:42.8 MIT,precision: 70.24	-	√
GA, HARP	average recall 69.8%	average precision 89.1%	-	√
CSLBP	√	precision :77.87%	-	-
SVM	√	precision : 0.844	-	-
HFCM	recall :0.71, min recall:0.31	Precision:0.81,min precision:0.69	-	-
(Histogram +BC)	√	√	-	-
GLCM	recall:26.19%	Average precision :82.66%	-	×
Kerkre on Cloud Computing	√	√	-	√
SIFT and SURF on Cloud computing	√	√	-	√
shearlet	Recall:81.233%	Precision:69:326%	-	√

VII. CONCLUSION

In this paper, image retrieval methods that used for improvement of the performance from where of precision and the speed of the retrieving have been discussion.these methods have advantages and some restrictions. That means, there is not one technique that suits superior all sorts of user's needs ,but using of advantages of cloud computing increase the improvement of performance system . PCA method is one of the important of these techniques which deal with very large datasets, where provids best performance from where of high accuracy and recovery of values with less calculation complexity through use the advantages of cloud computing. There are many techniques are used to images retrieve and their most important mentioned in table- I.

REFERENCES

1. Julie Verma, Urooj Fatima, " A Review on Research and Challenges in Modern Image Retrieval Techniques in Big Data Systems" , InternationalJournal ofResearch and Development in Applied Sciences and Engineering (IJRDASE) ISSN: 2454-6844 Volume 13, Issue 1, March 2017.
2. Mohamed M.BenIsmail ,"A Survey on Content-based Image Retrieval", (IJACSA) International Journal of Advanced Computer Science and Applications, Vol.8, No.5, 2017.
3. Mussarat Y., Sajjad M., Muhammad S., "Intelligent Image Retrieval Techniques: A Survey", COMSATS Institute of Information Technology Pakistan, 2014.
4. Chintamani Chavan, Madhuvan Dixit, "A Survey of Content Based Image Retrieval in Cloud Computing", Research Article Volume 7 Issue No.6 , ISSN XXXX XXXX © 2017 IJESC.
5. Maryam A., Nasim Aslani,"Capabilities and Advantages of Cloud Computing in the Implementation of Electronic Health Record" doi: 10.5455/aim.2018.26.24-28ACTA INFORM MED, MAR; 26(1): 24-28,2018.
6. Ian T.Jolliffe ,JorgeCadima ," Principal component analysis: a review and recent developments", rsta.royalsocietypublishing.org, Phil. Trans. R. Soc. A 374: 20150202, 2016.
7. Nishad Ahmed, Parismita Sarma "IMAGE RETRIEVAL SYSTEM BASED ON COLOR (QUANTIZED HSV) AND TEXTURE FEATURE (GLCM)", International.Journal of.Computer Science Engineering (IJCSE), ISSN : 2319-7323 Vol. 6 No.05 May 2017.
8. Benchikh Hadjer,Razi Sara,Korichi Halima," Content-based image retrieval"2017.
9. Dr. Mamta Meena, Shrutika Mallya and Shrusti Talati," Effectiveness of Saas Cloud Model For Retrieving Images From CBIR System", IOSR Journal of Engineering(IOSRJEN) ISSN (e): 2250-3021, ISSN (p): 2278-8719 PP 70-74,2018.
10. Prof.S.Govindaraju, Dr.G.P.Ramesh Kumar, "Content Based Image Retrieval Using Hierarchical and Fuzzy C-Means Clustering" International Journal of Computer Trends and Technology(IJCTT) – Volume 44 Issue 2- February 2017.
11. NaveenaAK, N K Narayanan ,"Sub-Block based Color Moments, Wavelet and Edge Histogram for Image Retrieval, International Journal of Innovative Computer Science& Engineering Volume 4 Issue 3; May-2017.
12. Dr.K.Meenakshisundaram,G. Vijaiprabhu," AN ENHANCED CENTER SYMMETRIC LOCAL BINARY PATTERN TECHNIQUE FOR IMAGE RETRIEVAL USING EUCLIDEAN DISTANCE ",International Journal of Contemporary Research in Computer Science and Technology(IJCRCST) ISSN: 2395-5325Volume 3, Special Issue 1,2017.
13. Mr. Yogen Mahesh Lohite, Prof. Sushant J. Pawar, "A novel method for Content Based Image retrieval using Local features and SVM classifier", International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 04 Issue:0 7, 2017.
14. R. M. MOHANA, Dr. A. R. MOHAN , "CCBIR: A Cloud Based Implementation of Content Based Image Retrieval", E-ISSN: 2224-2872 333 Volume 14,2015.
15. Hatem Aouadi, Mouna Torjmen Khemakhem, and Maher Ben Jemaa," An LDA Topic Model Adaptation for Context-Based Image Retrieval", 10.1007/978-3-319-27729-5_6, Conference Paper • September, 2015.
16. Anas Fouad Ahmed., "A COMPARATIVE STUDY OF HUMAN FACES RECOGNITION USING PRINCIPLE COMPONENTS ANALYSIS AND LINEAR DISCRIMINANT ANALYSIS TECHNIQUES",www.jeasd.org Vol. 20, No.05, ISSN 2520-0917, 2016
17. Sun Ting and Geng," Image Retrieval Method for Deep Neural Network", International Journal of Signal Processing, Image Processing and Pattern Recognition Vol.9, No.7(2016), pp.33-42 http://dx.doi.org/10.14257/ijsip.2016.9.7.04 ,2016.
18. Dandan L.,Jian Shen , Zhihua X. , and Xingming Sun,"A Content-Based Image Retrieval Scheme Using an Encrypted Difference Histogram in Cloud Computing", 8, 96; doi:10.3390/info8030096 www.mdpi.com/journal/information,2017.
19. Manisha V., Balasubramanian R.," Local neighborhood difference pattern: A new feature descriptor for natural and texture image retrieval ", Multimed Tools Apple DOI 10.1007/s11042-017-4834-3, 2017.

20. S.Selvam and S.Thabasu Kannan," A New Architecture for Image Retrieval Optimization with HARP Algorithm", Asian Journal of Computer Science and Technology,ISSN: 2249-0701 Vol. 6 No.1, 2017.
21. Intedhar Shakir Nasir," A New Approach for Content Based Image Retrieval Using Statistical Metrics", Jour of Adv. Research in Dynamical & Control Systems, Vol. 10, 13-Special Issue,2018.
22. Umesh D. D. and M. S. Sh.," Face-based Document Image Retrieval System" ,International Conference on Computational Intelligence and Data Science (ICCIDS 2018).
23. Sidi Ahmed M., Mohammed Amin Be., El Wardani D. , Saïd Mahmoudi and Mohammed Be. , "Cloud-Based Image Retrieval Using GPU Platforms", Computers 2019, 8, 48; doi:10.3390/computers8020048,2019.
24. Vo Thi H. Tuyet,Nguyen Mong Hien , Pham Bao Q., Nguyen Thanh S., Nguyen Thanh Binh," Adaptive Content-Based Medical Image Retrieval Based On Local Features Extraction In Shearlet Domain", EAI Endorsed Transactions on Context-aware Systems and Applications, 2019.
25. Ge Zhang,Liqun Tang,Licheng Zhou , Zejia Liu , Yiping L. and Zhenyu J., "Principal Component Analysis Method with Space and Time Windows for DamageDetection",doi:10.3390/s19112521, www.mdpi.com/journal/sensors, 2019.
26. N. Santhi, K. Annbuselvi, Dr. S. Sivakumar, "Performance Analysis of Feature Extraction Techniques: PCA and LDA for Face Recognition", ISSN (Online) 2394-2320, International Journal of Engineering Research in Computer Science and Engineering(IJERCSE),Vol 5, Issue 3, March 2018.

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