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VISUAL SEARCH ON CLOUD WITH PRIVACY

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Abstract: In Content-Based Image Retrieval (CBIR) the indexing of the image and the representation is done using visual contents of an image like color, shape, texture and spatial layout. Cloud storage is a popular choice to handle a large size data because its cost is much lower than hardware upgrade and infrastructure reorganization. Nowadays, image-based data is getting important in many applications such as face identification, disease detection and object recognition and it usually needs more storage than text-based data. However, the images usually contain personal and confidential information and hence directly outsourcing the image dataset to the cloud will arouse the privacy issue. To protect the sensitive information in images, it is necessary to encrypt images before being uploaded to the cloud. After storing the encrypted image data in the cloud, the users will ask the cloud server for the search of the target image data. However, current content-based image retrieval technologies are usually useless for searching encrypted image data, and hence this system tries to solve the problem of searching encrypted images in a large database.

Keywords:k-Nearest Neighbour(kNN) , Homomorphic Encryption(HE) , Asymmetric Scalar Product Preserving Encryption(ASPE) , Content Based Image Retrieval(CBIR) , Text Based Image Retrieval(TBIR)

I. INTRODUCTION

Recent development in technology, there is an increase in the usage of digital cameras, smartphones, and the Internet. The shared and stored multimedia data are growing, and to search or to retrieve a relevant image from an archive is a challenging research problem .Cloud computing is a technology that uses the internet and central remote servers to maintain data and applications. It allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access. This technology allows for much more efficient computing by centralizing storage, memory, processing and bandwidth. Cloud computing is another powerful concept in the computer world based on the principle of on-demand computing. It is kind of internet based computing which allows users to utilize computing resources from a shared pool. It's an economical solution for enterprises with various capabilities like storing their data and processes it at the third party data centers.Cloud computing is characterized by five attributes: on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service. The cloud computing movement is motivated by the idea that data processing and storage can be done more efficiently on large farms of computing and storage systems accessible via the Internet. It supports a paradigm shift from local to network-centric computing and network centric content where distant data centers provide the computing and storage resources. It offers scalable and elastic computing and storage charged only for the resources they used. The resources used for these services can be metered and the users can be a large number of organizations that have adopted this paradigm. Cloud computing is cost-effective because of resource multiplexing. Application data is stored closer to the site where it is used in a manner that is device and location-independent; potentially, this data storage strategy increases reliability, as well as security. The maintenance and the security are ensured by service providers. Organizations using computer clouds are relieved of supporting large IT teams, acquiring and maintaining costly hardware and software, and paying large electricity bills. Data analytics, data mining, computational financing, scientific and engineering applications, gaming and social networking, as well as other computational and data-intensive activities benefit from cloud computing. Storing information on the cloud has significant advantages. Content previously confined to personal devices such as workstations, laptops, tablets, and smartphones need no longer be stored locally. Data stored on computer clouds can be shared among all these devices and it is accessible whenever a device is connected to the Internet. It represents a dramatic shift in the design of systems capable of providing vast amounts of computing cycles and storage space. Computer clouds use off-the shelf, low-cost components. The architecture, the coordination mechanisms, the design methodology, and the analysis techniques for large-scale complex systems such as computing clouds will evolve in response to changes in technology, the environment,

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and the social impact of cloud computing. Some of these changes will reflect changes in communication, in the Internet itself in terms of speed, reliability, security, capacity to accommodate a larger addressing space by migration to IPv6, and so on. Advances in one field are critical for the other. Indeed, cloud computing could not emerge as a feasible alternative to the traditional paradigms for high-performance computing before the Internet was able to support high-bandwidth, low-latency, reliable, low-cost communication. At the same time, modern networks could not function without powerful computing systems to manage the network. High performance switches are critical elements of both networks and computer clouds. Security and privacy are major concerns for cloud computing users. Cloud services are applications or services offered by means of cloud computing. Therefore, by adopting cloud services, business managers are considering taking advantage of the economic benefits offered by maintaining parts of its IT resources and tasks by a cloud service provider. Nowadays, nearly all large software companies, such as Google, Microsoft, and Oracle, are providing cloud services. Cloud computing also provides strong storage, computation, and distributed capability to support Big Data processing. In order to achieve the full potential of Big Data, it is required to adopt both new data analysis algorithms and new approaches to handle the dramatic data growth and needs of massive scale analytics. This project consists CBIR (Content-Based Image Retrieval) technique, the application of computer vision techniques to the image retrieval problem, that is, the problem of searching for digital images in large databases. The search analyses the contents of the image rather than the metadata such as keywords, tags, or descriptions associated with the image. The term "content" in this context might refer to colours, shapes, textures, or any other information that can be derived from the image itself.The basic need for any image retrieval system is to search and sort similar images from the archive with minimum human interaction with the machine.The CBIR tools can be utilized in numerous applications such as digital libraries, photo sharing sites and crime prevention. There are various techniques for content based image retrieval that have been presented in the past, which are either based on extracting the individual image feature or combination of these features. Some of the techniques are based on the same image feature extraction, but different in the method of extracting the particular image feature.

OBJECTIVE

The objective is to retrieve significant images from an assorted collection using image queries and text queries as search arguments using color, texture and shape features. CBIR systems are intended to deal with images in the database where the stored images can only be used as a query rather than to have the choice of query from the user. To improve privacy and to make efficient search from a large database.

SCOPE

The CBIR technology has been used in several applications such as

●Medicine

●Agriculture

●Fingerprint identification

●Biodiversity information systems

●Digital libraries

●Crime prevention

●Historical research.

●IT industry

●Commercial purpose

●Education Applications

●Entertainment Application

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II.ANALYSIS

SYSTEM ANALYSIS

The basic need for any image retrieval system is to search and sort similar images from the archive with minimum human interaction with the machine. .The objective of CBIR is to excerpt visual content of an image inevitably, like color, shape or texture. There are various techniques for content based image retrieval that have been presented in the past, which are either based on extracting the individual image feature (color, texture or shape) or combination of these features. Some of the techniques are based on the same image feature extraction, but different in the method of extracting the particular image feature.

Problem Definition

The simplicity and more efficient image retrieval system seem to grow too much in the near future and the development of advanced and user-friendly systems can solve the problems and provide highly reliable and secure systems.

Existing system

In the previous system the privacy preserving content based image retrieval scheme, where the data owner outsourced images from the large scale repository with the proposed CBIR techniques from the cloud administrator. Then to improve search results the key content is compared with cloud administrator for an exact match. The privacy preserving content based image retrieval is performed by the third party.

Disadvantages:

●Lack of privacy

●Data is not in encrypted format.

●Third party access.

Proposed system

The kNN algorithm takes a computational overload while searching in a dataset. In Order to improve the search time, the enhanced algorithm is applied to simplify the search over a large database like 10K images. We try to develop a decision scheme to optimize lower codebook size to improve the system efficiency and ensure the high accuracy.

Advantages:

●Improved privacy

●Search time is improved

●Efficient than other approaches.

●Encrypt which is Confidential

III.SYSTEM DESIGN

1. Feature Extraction Module: Feature extraction is a part of the dimensionality reduction process, in which an initial set of the raw data is divided and reduced to more manageable groups.The most important characteristic of these large data sets is that they have a large number of variables.Feature extraction performs a critical role in CBIR. Color, texture and shape features are used in this proposed paper and we use histogram, basically giving the frequency distribution of the color bins in the image. An image histogram can be defined as the probability mass function of the image

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intensities. The user submits his search argument in the form of an image to the system. Color histogram of the input image is then calculated and compared with the ones that are present in the system database.

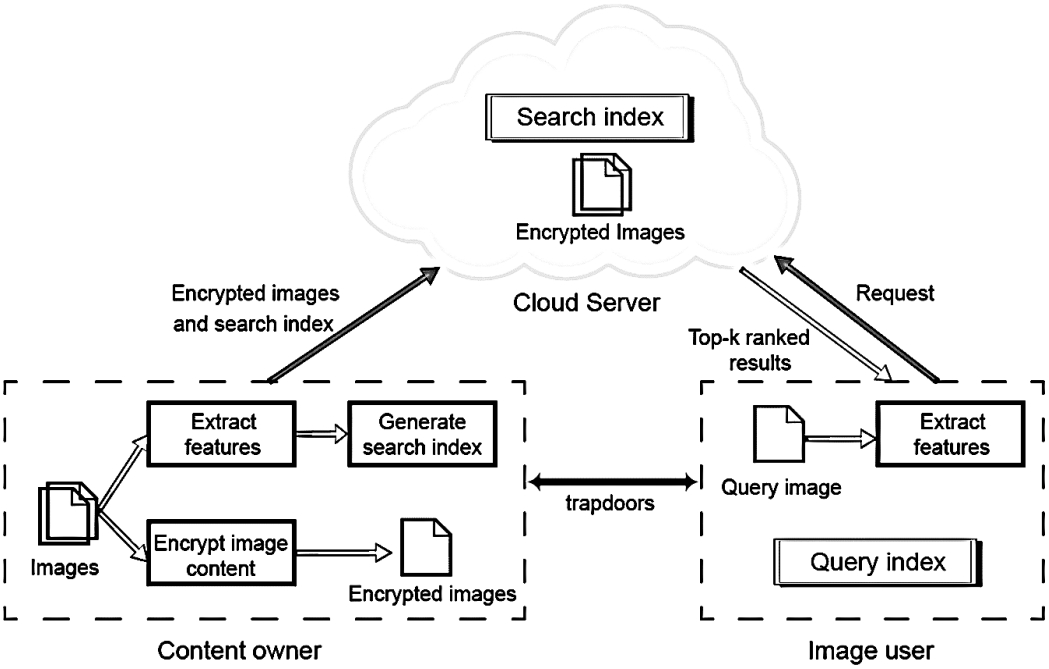

Fig 1:Overall System Design

IV.MODULES

1. Feature Extraction
2. Secure Index Building
3. Search Query Image
4. Send Images to Dataset

2. Secure Index Building Module: In this phase, we firstly extract the local descriptor from the image database and perform a VLAD (Vector of Locally Aggregated Descriptors) algorithm to represent each image .By this process we are able to differentiate and assign index to each image in database. Indexing helps to traverse through all data efficient. Now after indexing we have to arrange the indexes for fast retrieval of the data in database for that we gonna use tree data structure. We build the tree by recursively conducting k-means algorithms and encrypting all values of non-leaf nodes with the use of our secure mechanism. In this way, only feature space, the k-nearest neighbour (kNN) query becomes the best algorithm to retrieve top-k relevant data.

3. Search Query Image Module:After the data owner transfers the encrypted images and secure index to the cloud server, our system is ready to provide content-based image search service in the cloud. Before the user asks for the permission of the searching service, he encrypts the query descriptor by Paillier cryptosystem. Although the data owner receives a vector that is composed of ciphertexts, he still can generate the trapdoor securely without knowing anything. When the data owner returns the encrypted trapdoor to the user, the user obtains the trapdoor through decrypting the ciphertext with his own key. Then the similar images to the query image can be retrieved by the user from the cloud server.

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4. Send Images to Dataset: In this phase, the data owner who is sending his data to the cloud server has to define the secure mechanism to the data in the setup phase. The cloud server follows the designated protocol, which means the cloud server will not do the extra actions for protecting image searching that's the reason for using ASPE(asymmetric scalar-product-preserving encryption).These images are stored and protected using ASPE (asymmetric scalar-product-preserving encryption).Then, the data owner randomly generates an invertible matrix as a secret key for ASPE(asymmetric scalar-product-preserving encryption).The secret key is the important part in our scheme and the data owner should keep it confidential. Because the user or cloud server cannot be trusted, if the secret key was leaked all the data stored in the server will also be revealed causing privacy issues. To reduce this type of issue we used trapdoor to detect malicious user.

V.RESULTS AND DISCUSSION

The results analysis was carried out in order to achieve secure search for the encrypted image and retrieve the images from a cloud server without losing any data that data owner provided, we developed a new privacy preserving image retrieval system in which ASPE was used for encrypting images in cloud server, to the best of our knowledge. However, ASPE implements kNN for searching dataset, which also causes serious computation overhead. In order to improve the performance of the search time, k-means algorithm is applied in ASPE to simplify the descriptors of large-scale databases.After conducting analysis in this system, we had a decent amount of efficiency in retrieving the images from a large database. We found out that our proposed system performed as high than the existing system. We also reduced the time take for execution.

VI.CONCLUSION

In this project we have proposed a new secure framework for the privacy-preserving outsourced storage, search, and retrieval of large-scale, dynamically updated image repositories, where the reduction of client overheads is a central aspect of our system. We improved privacy in large database as well as improved the efficiency of retrieval time.

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