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# Hidden Image Similarity Search in Secure Cloud Computing

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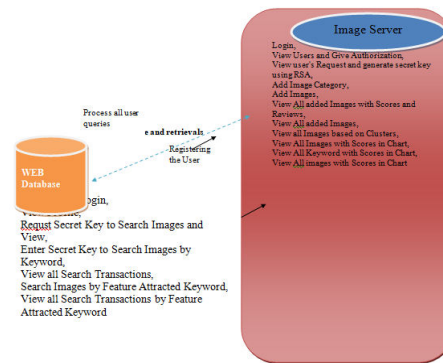
**ABSTRACT:** The Content-Based Images Retrieval (CBIR) method has drawn a lot of interest from various places as intelligent terminals have grown in popularity. (i.e had got a bunch of interest from multiple sources. etc.). Existing privacy-preserving CBIR systems continue to have flaws (such as low search reliability, limited query effectiveness, key leakage, etc.) despite being able to guarantee picture privacy while providing image retrieval. In this research, we present similarities in the analysis for images encrypted in secure cloud computing, or SEI, to address these difficult problems. First, search accuracy is improved by using the feature descriptors that the CNN model has extracted. Then, in order to increase search efficiency, a secure hierarchical index tree is created using K-means clustering, which is based on AP clustering. Then, to avoid the hidden information from being altogether leaked to dubious image customers, a limited key-leakage k-Nearest Neighbours (kNN) conduct is recommended. Finally, SEI has been improved to further ward prevent the cloud server acquiring about image client's keywords. Our rigorous security analysis is proof SEI can keep both key or image privacy. Our empirical tests on a real-world dataset prove the way SEI provides better search accuracy and efficiency. Keywords: CBIR, SEI, KNN, CNN, Cloud

## I. INTRODUCTION

With the quick growth and widespread adoption of cloud computing, consumers now benefit from a number of conveniences provided by cloud services, such as the ability to store photographs online. Images that are immediately outsourced to the public cloud, however, necessarily generate privacy issues. There will be severe repercussions or needless difficulties once the enormous photos (such as patient medical images) holding very sensitive information have been. While the encryption mechanism can somewhat allay worries about the security and privacy of picture data, it also renders the Content-Based picture Retrieval (CBIR) technique ineffective and raises other issues that are covered in the example that follows. Example. Alice sends the cloud server the encrypted photographs C from the local image database M. Using the searchable key sk that Alice shared, the authenticated Bob creates an encrypted search request T in response to the query picture mq when he searches for images that are comparable to mq. After receiving T, the cloud server searches C and sends Bob R the pertinent search results. Finally, Bob uses Alice's image encryption key kie to decrypt the R.

## II. LITERATURE SURVEY

These systems still have a lot of problems in practise, such as key leakage and low search efficiency. In particular, schemes [1], [2], [3], and [5] directly distributed keys to users, increasing the possibility that key leakage would occur from image users; schemes [3], [5] compromised accuracy to gain efficiency; and schemes [1], [4], [6], [7], and [8] added a lot of overhead to achieve high security. Figure 1 illustrates these difficulties restricting their practical applicability (poor search accuracy, low search efficiency, and key leakage). Regarding the first issue represented by 1 in Fig. 1, there are primarily two factors that affect the search accuracy. The type of feature descriptors is one, and the similarity computation method is another. In terms of the former, image feature descriptors can be divided into global (e.g., Scale Invariant Feature Transform (SIFT), Histogram of Oriented Gradients (HOG), etc.) and local (e.g., Local Binary Pattern (LBP), Speeded-Up Robust Features (SURF), etc.) features. Due to their greater robustness, local features can perform searches with greater precision than global features. There are also works [9, 10] that employ a Convolutional Neural Network (CNN) model simulating human visual cognition to extract feature vectors, which achieves acceptable accuracy, or combine global features and local features with specific weights to produce new features. For the latter, Euclidean distance, Cosine distance, Hamming distance, and Jaccard similarity are used to determine how similar the images are similar.



Fig[1] System Architecture

### III. EXISTING SYSTEM

Since Song et al. first put forth the idea of SE, more and more SE schemes have been published that are enhanced with various properties. The majority of them have to do with searching textual material using one, two, or more keywords—or with fuzzy keywords. There aren't many CBIR privacy-preserving plans. Based on order-preserving encryption and min-hash algorithms, Lu et al. introduced the first privacy-preserving CBIR scheme. However, this approach only supports visual feature word descriptions and has lesser search accuracy when compared to CBIR strategies employing Fish vector. In order to increase search accuracy, Huang et al. created a brand-new private feedback system based on the K-anonymity principle and the Support Vector Machine (SVM) technology. This method continuously corrects the search results that are delivered, which further increases search accuracy. Similar to this, Hazra et al. developed a secure image retrieval system that integrated SVM and k-Nearest Neighbour (kNN) with HSV histogram as picture features to search for related images, achieving excellent search accuracy. In a recent study, Xia et al. developed a unique Bag-of-Encrypted-Words (BOEW) model to provide a CBIR technique that protects privacy. This method produced highly accurate search results by extracting features from encrypted photos.

### IV. PROPOSED SYSTEM

To address the aforementioned issues, the system suggests a Similarity Search for Encrypted Images in Secure Cloud Computing (SEI). To be more precise, we use the CNN model to extract feature vectors to boost search efficiency and then design a bottom-up hierarchical index tree based on the clustering technique to boost search accuracy. Additionally, in order to achieve low key-leakage for untrusted image users, we build an optimised ASPE algorithm that does not require the image owner to exchange sk with image users. Our contributions are listed below in their entirety. **High search accuracy.** By extracting feature vectors with the help of the pre-trained CNN model, SEI achieves a high search accuracy. The similarity assessment between photos and search results is more precise because the CNN model, which simulates the human visual perception process, can more properly reflect the image content. more accurate.

**High search efficiency.** When classifying photos, SEI employs the improved K-means clustering technique and builds a bottom-up hierarchical index tree based on the clustering outcomes. As a result, SEI performs search operations without traversing the complete picture database, which cuts down on search time to sublinear time. Further enhancing search efficiency is the use of the Principal Component Analysis (PCA) algorithm to reduce the dimensionality of the image feature vectors extracted by the CNN model.

**Limited key leakage.** In addition to preventing untrusted image users from totally disclosing private keys, SEI offers a secure trapdoor generation procedure with limited key-leakage so that when an image user develops trapdoors locally, the image owner is not required to give online assistance. Furthermore, even if an unauthorised image user



stealthily learns some searchable key information from an untrusted user, he won't be able to create a workable query trapdoor or decrypt the image owner's ciphertext.

## V. IMPLEMENTATION

### Image Server

In this module, image server has login by valid user name and password. After login successful he can do some operations such as View Users and Give Authorization, View user's Request and generate secret key using RSA, Add Image Category, Add Images, View All added Images with Scores and Reviews, View All added Images, View all Images based on Clusters, View All Images with Scores in Chart, View All Keyword with Scores in Chart, View All images with Scores in Chart.

### End User

In this module, there are n numbers of users are present. User should register before doing some operations. After registration successful he can login by using valid user name and password. Login successful he will do some operations like View Profile, Request Secret Key to Search Images and View, Enter Secret Key to Search Images by Keyword, View all Search Transactions, Search Images by Feature Attracted Keyword, View all Search Transactions by Feature Attracted Keyword.

## VI. CONCLUSION

We examine similarity search for encrypted photos in secure cloud computing in this paper. We specifically introduce a clustering improvement method and provide the hierarchical index tree design method. Based on features collected by the CNN model, SEI can complete the retrieval process quickly and accurately with these two strategies. Furthermore, we take into account SEI's unreliable image users, leading us to suggest a key-leakage-restricted similarity calculation technique. We also do tests on a real-world dataset and provide a strict security analysis, both of which show that SEI is secure and practical. Our upcoming projects can be summed up as follows:

- Supporting dynamic update: We'll create a technique for creating an effective index and enabling support for dynamic updating of picture databases.
- Supporting multi-owner scenario: To accommodate the multi-owner scenario, the administration concerns for various image encryption keys will be fixed.
- Supporting verifiable: The user of an image who receives search results via an image search can check the outcomes.

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