Blockchain-assisted verifiable and secure remote sensing image retrieval in cloud environment

Abstract

Secure retrieval of remote sensing images in an outsourced cloud environment garners considerable attention. Since the cloud service provider (CSP) is considered as a semi-trusted third party that may return incorrect retrieval results to save computational resources or defraud retrieval fees for profit, it becomes a critical challenge to achieve secure invariable remote sensing image retrieval. This paper presents a secure retrieval and blockchain-assisted verifiable scheme for encrypted remote sensing images in the cloud environment. In response to the characteristic that geographical objects in remote sensing images with clear category attributes, we design remote sensing image retrieval method to facilitate secure inefficient retrieval. In addition, we propose a verifiable method combined with blockchain and Merkle trees for checking the integrity and correctness of the storage and retrieval services provided by CSP, which can replace the traditional third-party auditor. The security analysis and experimental evaluation demonstrate the security, verifiability, and feasibility of the proposed scheme, achieving secure remote sensing image retrieval while preventing malicious behaviour of CSP.

Existing System:

The framework of secure CBIR is generally composed of two modules: feature protection and feature similarity measurement. The progress of these modules will be reviewed specifically. The goal of feature protection is to extract the image features and encrypt them with encryption techniques to ensure the encrypted image feature descriptors can be used for retrieval calculation. Generally, the visual content of remote sensing images is expressed by traditional hand-crafted or deep network features [25]. In particular, deep learning networks have been demonstrated to have a strong ability to recognize essential features of images [26]. As a result, it is feasible and acceptable to employ deep network features to retrieve remote sensing images since they show an overwhelming advantage over hand-crafted features

Disadvantages:

Although works [7] have low computational complexity, the encrypted features still remain the original feature information and the retrieval performance is insufficient, implying that the retrieval security and performance of these works are invade-quate. To solve the above problems, a secure image retrieval based on homomorphic encryption is proposed

Proposed system:

we propose a blockchain-assisted verifiable and secure remote sensing im-age retrieval in the cloud environment in this paper. Our goal is to share remote sensing images securely and efficiently a semi-trusted cloud environment, as well as check the integrity and correctness of retrieval results without TPA.

Advantages:

Considering the vulnerabilities of TPA, the blockchain is employed for security verification in this paper. Since current retrieval verification schemes do not consider the correctness of the retrieved results and the correctness of the similarity ranking of the returned images, we combine blockchain.

Modules:

User:

Using this module mobile user can register with application and login with valid username and password. User will get key from key management to login upload image and encrypt data and send to cloud server with block chain for attribute. User can view data and send to cloud..

Cloud Server :

Using this module cloud server will login view data uploaded by user and view requests from retravel user and respond to message by send request to block and verify block chain and then send decryption key to retravel user.

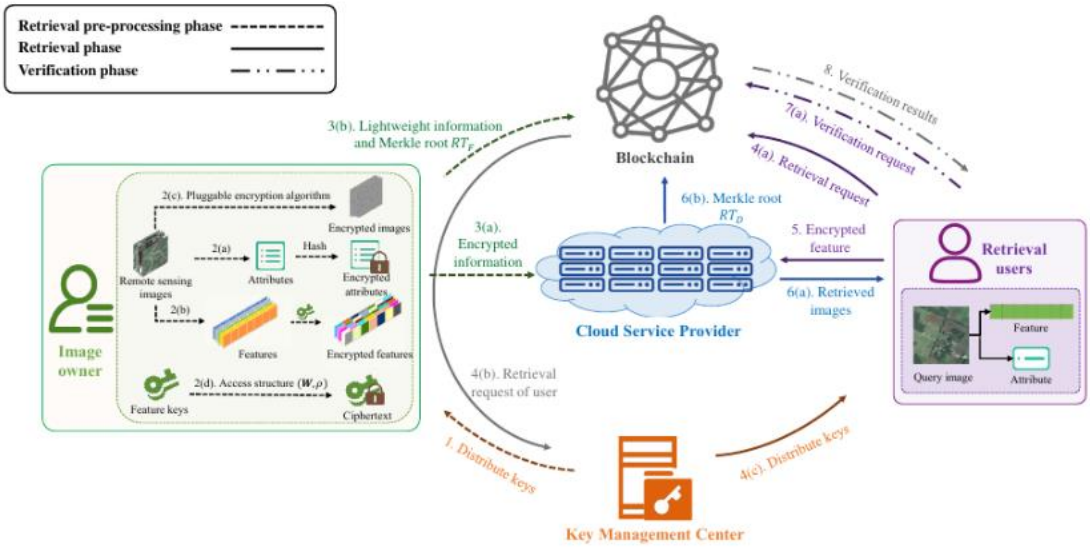
Block chain Server:

Using this module block chain server can login view requests from cloud server verify block chain and send confirmation to retravel user.

Key management :

Using this module key management will login and view users authorize and send security key for login.

Architecture:



System Requirements:

SYSTEM REQUIREMENTS:

HARDWARE REQUIREMENTS:

- PROCESSOR : I3.
- Hard Disk : 40 GB.
- Ram : 2 GB.

SOFTWARE REQUIREMENTS:

- Operating system : Windows.
- Coding Language : JAVA/J2EE
- Data Base : MYSQL
- IDE :Netbeans8.1

References:

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