

EEIRI: Efficient Encrypted Image Retrieval in IoT-Cloud

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Abstract

One of the best means to safeguard the confidentiality, security, and privacy of an image within the IoT-Cloud is through encryption. However, looking through encrypted data is a difficult process. Several techniques for searching encrypted data have been devised, but certain security solutions may not be used in IoT-Cloud because such solutions are not lightweight. We propose a lightweight scheme that can perform a content-based search of encrypted images, namely EEIRI. In this scheme, the images are represented using local features. We develop and validate a secure scheme for measuring the Euclidean distance between two descriptor sets. To improve the search efficiency, we employ the k -means clustering technique to construct a searchable tree-based index. Our index construction process ensures the privacy of the stored data and search requests. When compared with more familiar techniques of searching images over plaintexts, EEIRI is considered to be more efficient, demonstrating a higher search cost of 7% and a decrease in search accuracy of 1.7%. Numerous empirical investigations are carried out in relation to real image collections so as to evidence our work.

Keywords: Searchable encryption, secure image retrieval, IoT-Cloud, k -means clustering, SURF local feature, similarity measure