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A SURVEY ON PRIVACY-ASSURED HEALTHCARE MONITORING BY ENABLING SECURE AND FAST INDEXING

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Abstract- *The proliferation of e-health technology, enormous amount of multimedia-based health data is being exponentially generated from medical devices and sensors. Coming with it are the challenges on how to efficiently acquire, index, and process such a huge amount of data for effective healthcare and related decision making, while respecting user's data privacy. In this paper, propose a secure cloud-based framework for privacy -aware healthcare monitoring systems, which allows fast data acquisition and indexing with strong privacy assurance. For efficient data acquisition, adopt compressive sensing for easy data sampling, compression, and recovery. Then focus on how to secure and fast index the resulting large amount of continuously generated compressed samples, with the goal to achieve secure selected retrieval over compressed storage. One particular challenge is the practical demand to cope with the incoming data samples in high acquisition rates. For that problem, exploit recent efforts on encrypted search, efficient content-based indexing techniques, and fine -grained locking algorithms, to design a novel encrypted index. It achieves memory efficiency, provable security, as well as greatly improved building speed with nontrivial multithread support for Comprehensive evaluations on Amazon Cloud.*

Key Words: **Cloud computing, privacy-aware healthcare, fast encrypted indexing, multimedia-based healthcare, compressive sensing.**

1. INTRODUCTION

Today several healthcare organizations started to shift the patient health information to the cloud environment. Healthcare monitoring device is used for monitoring the patient's health conditions. Those health monitoring information can stored and communicate with the medical user or healthcare providers (doctor or nurse). In emergency situation health monitoring device will provide the service to client who registered in healthcare center using mobile cloud computing. The main objective of this work is to study the problem of how to efficiently acquire, index, and process such a huge amount of data for effective healthcare and related decision making, while respecting user's data privacy.

To be specific, for this work, proposed secure cloud-based framework for privacy-aware healthcare monitoring systems, this allows fast data acquisition and indexing with strong privacy assurance. For efficient data acquisition, accept compressive sensing for easy data sampling, compression, and recovery. Also focus on how to secure and fast index the resulting large amount of continuously generated compressed samples, with the goal to achieve secure selected retrieval over compressed storage.

Healthcare monitoring device is used for monitoring the patient's health conditions. Those health monitoring information can stored and communicate with the medical user or healthcare providers (doctor or nurse). Therefore the several healthcare organizations started to shift the patient health information to the cloud environment.

As e-health technology continues to advance, health related multimedia data is being exponentially generated from healthcare monitoring devices and sensors. Coming with it are the challenges on how to efficiently acquire, index, and process such a huge amount of data for effective healthcare and related decision making, while respecting user's data privacy.

Thus, how to secure and fast index the resulting large amount of continuously generated compressed samples, with the goal to achieve secure selected retrieval over compressed storage is a complex problem to be solved.

With the proliferation of e-health technology, enormous amount of multimedia-based health data is being exponentially generated from medical devices and sensors. So the several healthcare organizations started to shift the patient health information to the cloud environment. However, for such a promising paradigm of cloud-based health monitoring to become truly successful, there are still fundamental and critical challenges yet to be fully addressed like health data is personal and sensitive in nature. Directly exposing them in the public cloud environment may raise concerns on possible privacy regulation violations. The physiological data of an individual are highly sensitive. So, that the security is a paramount requirement of healthcare applications, particularly in the case of patient privacy, if the patient has an embarrassing disease.

Also any unauthorized collection or leakage of patient data could harm the patient. However, an unauthorized person may use the patient data (such as, patient identity) for their personal benefit, such as for fraudulent insurance claims, medical fraud, and sometimes this may even pose life-threatening risks. Another one is how to quickly index those samples and make them promptly available for search and utilization becomes a critical challenge. This motivated to provide survey on secure & fast indexing for Privacy-Assured Healthcare Monitoring System.

In this paper we have surveyed on Privacy-Assured Healthcare Monitoring. Section 2 of this paper deals with Literature Survey and Section 3 presents Proposed System. Section 4 concludes this paper.

2. LITRATURE SURVEY

A Comprehensive Literature Survey was performed in the support of the Healthcare Monitoring. In literature, various methods have been proposed to improve the performance of the Secure and Fast Indexing for Privacy-Assured Healthcare Monitoring. As e-health technology continues to advance, health related multimedia data is being exponentially generated from healthcare monitoring devices and sensors. Coming with it are the challenges on how to efficiently acquire, index, and process such a huge amount of data for effective healthcare and related decision making, while respecting user's data privacy.

This paper proposed a secure cloud-based framework for privacy-aware healthcare monitoring systems, which allows fast data acquisition and indexing with strong privacy assurance. For efficient data acquisition, by adopt compressive sensing for easy data sampling, compression, and recovery. [1] In the paper [2], a novel method is proposed to the problem of confidentiality preserving content-based image search. In this system reviewed two major types of techniques for this problem, namely techniques based on homomorphic encryption, and techniques based on visual feature and search index randomizations.

Wireless sensors are being increasingly used to monitor/collect information in healthcare medical systems. For resource-efficient data acquisition, one major trend today is to utilize compressive sensing. To address the problem, the paper [3] proposed a privacy-aware cloud-assisted healthcare monitoring system via compressive sensing, this integrates different domain techniques. It handles well sparse and general data, and data tampered with noise.

In the paper [4], a novel method is proposed to the increasing popularity of images at social media sites is posing new opportunities for social discovery applications. That suggesting new friends and discovering new social groups with similar interests. Proposed system designed and implemented a privacy-preserving image-centric social discovery system to expand user's friends with common interests effectively and securely. This system is deployed under modern architecture, which leverages cloud as image storage back end. Here first model user's social interests based on the image BoW representation, and then design a secure and compact similarity index to enable fast and scalable similarity search over millions of encrypted user image profile vectors.

Many big data analytics workloads, approximate results suffice. This needs the question, whether and how the underlying system architecture can take advantage of such relaxations, in today's architectures. This position paper explores one of the possible directions. Impression Store is a distributed storage system with the abstraction of big data vectors. It aggregates updates internally and responds to the retrieval of top-K high-value entries. In this paper [5] proposed system, gives that there are substantial benefits in not only adapting data processing, but the entire system architecture. If data is sparse and queries are mostly focusing on dominant components, a distributed system architecture that tightly integrates with Compressive Sensing.

In the paper [6], there is a fast-growing trend to outsource the large-scale image management systems to cloud today. However, for the image service outsourcing to be truly successful, there are still fundamental challenges yet to overcome. Firstly, because the cloud is a public environment operated by external third-parties usually outside the data owner/users trusted domain, the outsourcing design has to be privacy-protecting. Secondly, due to the high-dimensionality and large-scale of the image datasets, it is both necessary and desirable for the outsourcing design to be as efficient and less resource-consuming as possible in order to keep the cloud economically attractive. To address these fundamental challenges, the systems investigate a novel outsourced image recovery service (OIRS) architecture. In this paper, we exploits techniques from different domains and takes security, complexity, and efficiency into consideration from the very beginning of the service flow.

3. PROPOSED SYSTEM

Nowadays, several healthcare organizations started to shift the patient health information to the cloud environment. Healthcare monitoring device is used for monitoring the patient's health conditions. As e-health technology continues to advance, health related multimedia data is being exponentially generated from healthcare monitoring devices and sensors. Coming with it are the challenges on how to efficiently acquire, index, and process such a huge amount of data for effective healthcare and related decision making, while respecting user's data privacy.

In the proposed system architecture is depicted in Fig. 1. There is a gateway server operated by the data owner.

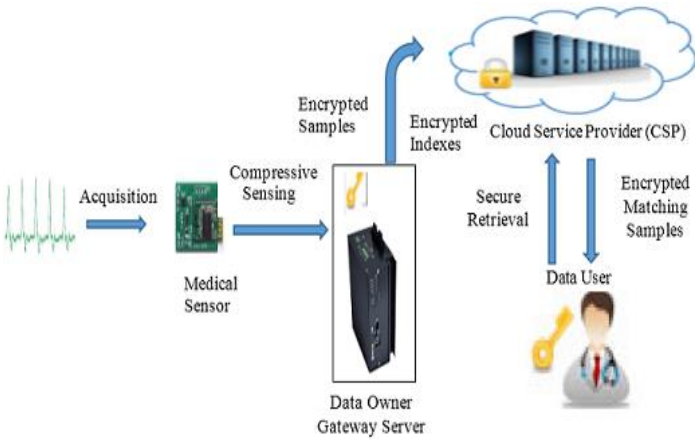

Figure 1: Proposed System Architecture

It continuously collects data samples from sensing devices within the generic compressive sensing frame work where the raw data is acquired and compressed in a uniform way with low energy cost. To relieve the local storage overhead, data owners, such as hospitals and healthcare monitoring applications, choose to outsource these compressed data samples to the cloud service provider. Because all pair wise distances between raw data objects are well preserved in the measurement space of compressed samples, data retrieval services can directly be enabled over the compressed data for high-value results. Data users such as doctors can send the request of interests to retrieve similar samples and reconstruct the raw data objects at their local side for further investigation and analytics like disease diagnosis.

3.1 Design Goals

The proposed design is to provide the strongest possible protection on the data privacy while simultaneously maintaining the service efficiency and quality for huge amount of increasingly generated health data in healthcare monitoring systems.

Various design goals are listed as follows:

1) Security guarantees: The system should ensure strong protection on data samples and query samples during the service flow. The cloud should never learn the content of data samples from the views it observes.
2) Fast index building speed: The encrypted index should be built in a reasonably short time even for billions of data samples.
3) Space efficiency: The encrypted index should achieve optimal space complexity, compact index size, and high load factors.
4) Query efficiency: The complexity of the proposed secure retrieval algorithm should be sub linear, and the query latency and bandwidth should be bounded.
5) Controllable accuracy: The tradeoffs between accuracy and efficiency should be understood. The retrieval accuracy should be controlled via tunable parameters.

4. CONCLUSION

In this paper, we surveyed privacy-aware healthcare system that supports secure and fast indexing of encrypted medical data in cloud environment. In addition to, address the challenges for continuously generated medical data samples at high rates and large volumes, an encrypted high-performance index proposed which can be fast built via concurrent insertion threads. For practical considerations, further improvement in the building performance via caching, reduce the bandwidth of secure retrieval, and explore the relationship between accuracy and efficiency. Proposed system gives investigation of the secure and Fast Indexing issues in the cloud environment and presented a complete solution for Privacy-Assured Healthcare Monitoring via Compressive Sensing.

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REFERENCES

[1] Xingliang Yuan, Xinyu Wang, Cong Wang,"Enabling Secure and Fast Indexing for Privacy-Assured Healthcare Monitoring via Compressive Sensing", IEEE Tran. On Multi., Vol. 18, Oct. 2016.

[2] W. Lu, A. L. Varna, and M.Wu, "Confidentiality-preserving image search: A comparative study between homomorphic encryption and distance preserving randomization," *IEEE Access, vol. 2, 2014.*

[3] C. Wang et al., "A privacy-aware cloud-assisted healthcare monitoring system via compressive sensing," in Proc. IEEE INFOCOM, Apr.–May 2014.

[4] X. Yuan, X. Wang, C. Wang, A. Squicciarini, and K. Ren, "Enabling privacy-preserving image-centric social discovery," in Proc. IEEE 34th Int. Conf. Distrib. Comput. Syst., Jun.–Jul. 2014.

[5] J. Zhang et al. ,"Impression store: Compressive sensing-based storage for big data analytics," in Proc. 6th USENIX Conf. Hot Topic Cloud Comput.,2014.

[6] C. Wang, Z. Xu, B. Zhang, K. Ren, and J. Wang, "Oirs: Outsourced image recovery service from compressive sensing with privacy assurance [extended abstract]," in Proc. Netw. Distrub. Syst. Security Symp., 2013.

[7] Amazon, "AWS Direct Connect," 2016. [Online]. Available: https://aws.amazon.com/directconnect/