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Derepo: A Distributed Privacy-Preserving Data Repository with Decentralized Access Control for Smart Health

Smart health has attracted a huge amount of attention nowadays with the advancement of information and communications technology. Meanwhile, the medical data is imperative to support smart health techniques. However, the storage of medical data faces serious security and privacy issues from the hacktivists, cloud service providers and even medical institutions. Therefore, we propose a novel data repository named Derepo to address these issues by securing the storage with the decentralized access control mechanism and preserving privacy via the homomorphic encryption scheme. We adopt the distributed ledger technology to endow the access control mechanism with trustworthy properties such as Byzantine fault tolerance. Besides, we utilize the fully homomorphic encryption scheme to protect data privacy and preserve the computability in the meanwhile. The design of Derepo is user-centric. Only the data owner can make the access control policy and decrypt their data while the authorized third parties can enforce the data processing processes on their encrypted data without knowing the original values.

Domain: Cloud Computing
Technology: Java