

An industrial IoT-based blockchain-enabled secure searchable encryption approach for healthcare systems using neural network

ABSTRACT

The IoT refers to the interconnection of things to the physical network that is embedded with software, sensors, and other devices to exchange information from one device to the other. The interconnection of devices means there is the possibility of challenges such as security, trustworthiness, reliability, confidentiality, and so on. To address these issues, we have proposed a novel group theory (GT)-based binary spring search (BSS) algorithm which consists of a hybrid deep neural network approach. The proposed approach effectively detects the intrusion within the IoT network. Initially, the privacy-preserving technology was implemented using a blockchain-based methodology. Security of patient health records (PHR) is the most critical aspect of cryptography over the Internet due to its value and importance, preferably in the Internet of Medical Things (IoMT). Search keywords access mechanism is one of the typical approaches used to access PHR from a database, but it is susceptible to various security vulnerabilities. Although blockchain-enabled healthcare systems provide security, it may lead to some loopholes in the existing state of the art. In literature, blockchain-enabled frameworks have been presented to resolve those issues. However, these methods have primarily focused on data storage and blockchain is used as a database. In this paper, blockchain as a distributed database is proposed with a homomorphic encryption technique to ensure a secure search and keywords-based access to the database. Additionally, the proposed approach provides a secure key revocation mechanism and updates various policies accordingly. As a result, a secure patient healthcare data access scheme is devised, which integrates blockchain and trust chain to fulfill the efficiency and security issues in the current schemes for sharing both types of digital healthcare data. Hence, our proposed approach provides more security, efficiency, and transparency with cost-effectiveness. We performed our simulations based on the blockchain-based tool Hyperledger Fabric and OrigionLab for analysis and evaluation. We compared our proposed results with the benchmark models, respectively. Our comparative analysis justifies that our proposed framework provides better security and searchable mechanism for the healthcare system.