Privacy Preserving Blockchain with Energy Aware Clustering Scheme for IoT Healthcare Systems

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Abstract

Due to advancements in information technology, the healthcare sector becomes beneficial and provides distinct methods of managing medical data and enhancing the quality of medical services. The advanced e-healthcare applications are mainly based on the Internet of Things (IoT) and cloud computing platforms. In IoT enabled healthcare sector, the IoT devices usually record the patient data and transfer it to the cloud for further processing. Energy efficiency and security are treated as critical problems in designing IoT networks in the healthcare environment. As IoT devices are limited to energy, designing an effective technique to reduce energy utilization is needed. At the same time, secure transmission of medical data also poses a major challenging design issue. This paper presents a novel artificial intelligence with a blockchain scheme for IoT healthcare systems named AIBS-IoTHS. The AIBS-IoTH model aims to achieve secure and energy-efficient data transmission in IoT networks. The IoT devices are primarily used to collect patients' medical data. The AIBS- IoTH model involves a metaheuristic-based modified sunflower optimization-based clustering (MSFOC) technique to achieve energy efficiency. Then, the blockchain empowered secure medical data transmission process is carried out for both inter-cluster and intra-cluster communication. At last, the Classification Enhancement Generative Adversarial Networks (CEGAN) model performs the diagnostic process on the secured medical data to determine the existence of the diseases. The design of MSFOC and CEGAN techniques shows the novelty of the work. An extensive experimental analysis of the benchmark dataset pointed out the superior performance of the proposed AIBS-IoTH model over the other compared methods.

Keywords