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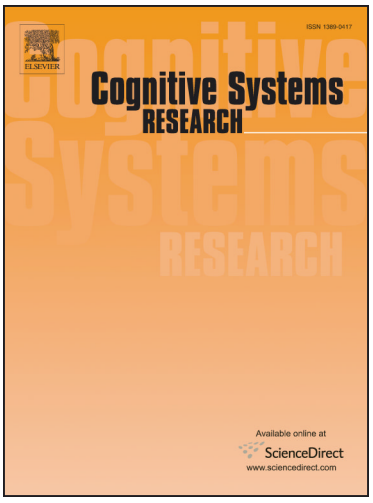

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Abstract

The privacy of patients is jeopardised when medical records and data are spread or shared beyond the protected cloud of institutions. This is because breaches force them to the brink that they start abstaining from full disclosure of their condition. This type of condition has a negative effect on scientific research, patients and all stakeholders. A blockchain-based data sharing system is proposed to tackle this issue, which employs immutability and autonomy properties of the blockchain to sufficiently resolve challenges associated with access control and handle sensitive data. Our proposed system is supported by a Discrete Wavelet Transform to enhance the overall security, and a Genetic Algorithm technique to optimise the queuing optimization technique as well. Introducing this cryptographic key generator enhances the immunity and system access control, which allows verifying users securely in a fast way. This design allows further accountability since all users involved are already known and the blockchain records a log of their actions. Only when the users' cryptographic keys and identities are confirmed, the system allows requesting data from the shared queuing requests. The achieved execution time per node, confirmation time per node and robust index for block number of 0.19 second, 0.17 second and 20 respectively that based on system evaluation illustrates that our system is robust, efficient, immune and scalable.

Keywords: Blockchain; Cryptography; Genetic Algorithm; Discrete Wavelet Transform; Medical Database Management; Decentralised processing.

1. Introduction

The electronic medical records or data related to the diagnosis and treatment of patient are considered extremely sensitive and private information. Consent data of patients are distributed across different controls as lifecycle events, which allow taking them away from one data provider to other [1]. This type of information is normally shared among peers such as clinics, hospitals, healthcare providers, researchers, insurance companies, healthcare centres and patient's families.

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