

Guest Editorial Preface

Special Issue on the Use of Blockchain Technology in Healthcare

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Blockchain is a decentralization communication platform that has the potential to decentralize the way we store data and manage information. Blockchain technology has potential to reduce role of middleman, one of the most important regulatory actors in our society. Blockchain technology enables a decentralized and distributed environment with no need for a central authority. Transactions are simultaneously secure and trustworthy due to the use of cryptographic principles.

In recent years, blockchain technology has become very trendy and penetrated different domains, mostly due to the popularity of cryptocurrencies. One field where blockchain technology has tremendous potential is healthcare, due to the need for a more patient-centric approach to healthcare systems and to connect disparate systems and increase the accuracy of electronic healthcare records (EHRs). In this special issue, an analysis of state-of-the-art blockchain and AI research in the field of healthcare have been considered.

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In this regard, the first article is devoted to a lightweight blockchain technique based on privacy and security for healthcare data for the cloud system. The cost-effectiveness of this system's smart contracts is evaluated, as well as the procedures used for data processing in order to encrypt and pseudonymize patient data.

In the second article, authors have emphasized on the perspectives of the Terahertz channel modeling in IoMNT networks. A modulation technique targeting body-centric network is discussed. An analogy of a real Terahertz antenna is developed within a terahertz multi-layer modelling channel for a human skin tissue. As a result, the investigation of how signals at THz frequency band interact and transmit within the skin biomaterial. The human skin model used to collect data was selected to have four layers: epidermis, dermis, blood, and hypodermis, with the depth of the layers varying between normal human body values.

The third article is to show how EHR can be implemented into healthcare sector for maintaining patient's data using blockchain technology i.e. how the data can be gathered, uploaded and accessed. Blockchain provide the way to efficiently handle the medical data.

The fourth article presents a mechanism for detecting violation of social distancing using deep learning to estimate the distance between individuals to diminish the influence of COVID-19. The

focus of this paper is to understand the effect of social distancing on the spread of COVID-19 by using YOLOv3 and Faster-RCNN and proposes IFRCNN (Improved Faster Region – Convolution Neural network). The proposed method IFRCNN is checked on a live streaming video of pedestrians walking on the street.

The fifth article refers to a solution to fully decentralize the current medical healthcare system by storing PCMHR on IPFS (InterPlanetary File System) to resolve the limitation of blockchain-based applications in scalability and high cost. Authors have depicted the cost and time analysis of transactions on the polygon framework to give a clear view of this multichain framework and its advantages over the ethereum blockchain.

The last article proposed an optimized clustering for dental dataset named Harmony Search based Categorical Clustering (HSCC). The result shows the proposed HSCC algorithm produced global optimized solution, unbiased and matured results. HSCC Produces 98% accuracy for dental and 71% for lung cancer dataset. While GACC produces 95% and 65% accuracy for dental dataset and lung cancer dataset.

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