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Special Issue: Sustainable Solutions for Internet of Things Using Artificial Intelligence and Blockchain in Future Networks
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Artificial Intelligence and Blockchain Technology Enabling Sustainable and Smart Infrastructure

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Abstract

This editorial aims to summarize the special issue entitled "Sustainable Solutions for Internet of Things Using Artificial Intelligence and Blockchain in Future Networks", which deals with the impacts of recent infrastructure development using the Internet of things. This special issue consists of four scientific articles.

Keywords

Artificial intelligence; IoT; Smart infrastructure; Blockchain technology; Computer networks.

The Internet of things (IoT) has become an essential aspect of sustainable infrastructure development. Every innovative application such as medicine, urbanization, transportation, social media, healthcare, supply chain, e-commerce, etc., requires IoT for data generation. The digital world is integrated with the physical world via IoT for data sensing from various environments. Artificial intelligence (AI) and blockchain technology help in efficient data analysis to make accurate decisions in real-time. Modern society depends independently on online services for all necessities such as shopping, transport, news, cooking, path planning, etc. Many countries worldwide have stepped into AI-based lifestyles using smart watches, traffic systems, and automated healthcare services. We are looking for sustainable solutions using AI, blockchain, and IoT. The IoT in various arenas is for example industrial IoT, Internet of medical things, or environmental IoT. There is no limit to applications where IoT is combined with AI and blockchain. This helps reduce hardware costs by embedding sensors in devices for creating IoT-integrated networks in smart agriculture, smart home, intelligent vehicles, smart pollution monitors, innovative healthcare, supply chain, e-commerce, and smart cities.

Society has become safe and sustainable due to the new accessible technologies. IoT, AI, and blockchain eliminate technological assessment barriers and help improve quality of life. In line with this, the theme "Sustainable Solutions for Internet of Things Using Artificial Intelligence and Blockchain in Future Networks" was chosen to summarize challenges and solutions associated with future networking technologies.

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This issue presents the sustainable use of IoT in healthcare and network security using blockchain, and sustainable solutions using AI. Research challenges for future networks from an IoT perspective and solutions using AI are illustrated in this issue. This special issue selects high-quality articles that answer recent research problems regarding future networks.

This issue builds on an international view of future networks with IoT, AI, and blockchain, which goes beyond traditional infrastructure development into a new perspective of smart infrastructure worldwide. This special issue aims to enrich the broad international discourse on intelligent IoT applications and their challenges in real-time applications. The articles were thoroughly reviewed by two or three international experts in the field of computer science. The reviewers were selected by the Special Issue Editors and Editor-in-Chief, who served as Academic Editor for all the articles. With the recommendation from the reviewers, the Editor-in-Chief sent the final notifications of acceptance, revision, or rejection to the authors. After further selection and peer review, four articles were accepted (acceptance rate 30%) for publication in Acta Informatica Pragensia.

Today organizations and society rely highly on technological innovations. The fourth industrial revolution (4IR) requires new business models with direct human interactions. This technical requirement uses IoT and AI for competitive growth (Bai et al., 2020, p. 1). The impact of the 4IR, and its associated technologies, such as blockchain, span various countries and industries, including manufacturing (Daniyan et al., 2021), education (Penprase, 2018), and finance (Yu & Song, 2021). Blockchain enables transparent and decentralized transactions famously associated with the cryptocurrency Bitcoin.

Most healthcare organizations are encouraged to move their healthcare-related services and storage toward the cloud via IoT. The recent COVID-19 pandemic has strengthened the healthcare sector of IoT and cloud networks, which is estimated to grow by USD 25.54 billion between 2020 and 2024 (Technavio, 2020). Cloud computing helps manage, share, protect and store electronic health records, medical images, pharmacy information systems, and laboratory information systems. Besides, patients will benefit from better care through up-to-date health records and ongoing interactions among various healthcare providers (Al-Issa, 2019).

We very much appreciate all authors who submitted articles with sustainable solutions for smart applications using intelligent technologies. The peer-reviewed articles in our special issue can be organized into design-oriented papers and review papers. Here, we introduce each of the four published papers briefly. The first design-oriented article, **Improving Privacy-preserving Healthcare Data Sharing in a Cloud Environment Using Hybrid Encryption**, presents healthcare advancement using IoT with secure data communication by South African authors. The second review article, **Blockchain Design and Implementation Techniques, Considerations and Challenges in the Banking Sector: A Systematic Literature Review**, presents various challenges associated with blockchain technologies. The third design-oriented article, **Evaluation of Community Detection by Improving Influence Nodes in Complex Networks Using InfoMap with Sigmoid Fish Swarm Optimization Algorithm**, presents community development in social media and the detection of influence nodes using AI techniques. The author helps to reflect future business perspectives in community development. The fourth review article, **Comprehensive Review of Multimodal Medical Data Analysis: Open Issues and Future Research Directions**, presents data analysis and its challenges for future research.

Computer science has high demand due to sustainable technologies such as IoT and AI. In our research work IoT, AI, and blockchain are used for various sustainable problems. However, this special issue is the first to invite sustainable solutions for various IoT-related applications using recent blockchain and AI techniques. Though AI was widely used in many applications, its demand was increased due to smart infrastructure development. Also, IoT is now part of many human activities such as health analysis, travel, agriculture, etc. These four articles presented the different contexts of the use of the terms IoT, AI, and blockchain.

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