

Call for Special Issue Papers: Deep Learning Blockchain-enabled Technology for Improved Healthcare Industrial Systems

Deadline for Manuscript Submission: 20 December 2022

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Special issue information

The regulation of Internet of Medical Things (IoMT) aware industrial networks for medical science applications has been evolving day by day. An IoMT industrial network consists of different bio-medical sensors, wireless technologies and cloud computing services to run different healthcare applications. However, IoMT industrial networks also suffer from dynamics uncertainties, such as intermittent changes in wireless network values, availability of cloud services and security issues, and require flexible systems to cope with these challenges for healthcare applications in the network; see, e.g., Lakhan et al. (2021a).

This special issue focuses on dynamic deep reinforcement learning and blockchain-enabled task scheduling systems for improved IoMT industrial applications. The goal is to persist in dynamic environments, adopt network and node changes and minimise processing costs while ensuring data security in the network. The initial purpose of dynamic deep reinforcement learning and blockchain-enabled task scheduling is to use deep reinforcement learning techniques and an efficient allocation mechanism to plan all Internet of Things (IoT) workflow jobs for different heterogeneous nodes. The created data are then saved and sent to a blockchain-enabled fog-cloud network in certified and secure formats. The direct policy quest in dynamic deep reinforcement learning and blockchain-enabled task scheduling aims to find the best scheduling strategy for dealing with adaptive changes in the problem state. The decentralized protection in a heterogeneous distributed network in dynamic deep reinforcement learning and blockchain-enabled task scheduling is validated using blockchain methods. The suggested dynamic deep reinforcement learning and blockchain-enabled task scheduling framework may achieve equivalent outcomes and flexible and real-time task scheduling for healthcare processes compared to traditional scheduling approaches; see, e.g., Lakhan et al. (2021b, 2021c, 2021d) or Mutlag et al. (2021).

The use of cloud-based healthcare technologies has been steadily increasing since the advent of 5G wireless networking, blockchain technology and fog computing. The fog cloud is a cooperative paradigm that boosts the performance of IoT applications with both data-intensive analysis and compute-intensive execution at different nodes in distributed computing. Many research studies have investigated the task scheduling problem, the resource allocation problem and application partitioning for healthcare applications in cooperative fog-cloud computing networks with efficient 5G technologies. At the same time, blockchain encourages decentralized security in distributed networks. Different machine learning algorithms have been introduced to adopt dynamic changes in resource and communication nodes during the processing of applications in various locations, such as the Deep-Q-Network resource allocation for IoT healthcare aware meta-heuristics; see, e.g., Lakhan et al. (2022).

The main objective of this special issue is to bring together diverse, novel and impactful research work on explainable deep learning for medicine based on the Internet of Medical Things, thereby accelerating research in this field. Therefore, suitable topics for manuscripts include, but are not limited to, the following:

- The role of blockchain technology and machine learning in human healthcare
- Artificial intelligence approaches based on patient-centric healthcare systems
- Dynamic deep reinforcement learning-powered blockchain for cardiovascular medicine
- The use of deep learning and blockchain to solve environmental issues within the smart healthcare industry
- Deep learning-based blockchain-as-a-service in Healthcare 4.0 industry applications
- Combinations of dynamic deep reinforcement learning and blockchain technology with medical big data
- Intelligent disease diagnosis based on dynamic deep reinforcement learning
- Biomedical signal image processing and analysis in Healthcare 5.0 industry applications
- Real-time explainable artificial intelligence (AI) for medical image and data processing
- Explainable artificial intelligence (XAI) and COVID-19 detection and classification-based Internet of Medical Things systems
- Deep neural networks for medical image detection, recognition and segmentation
- Future directions of intelligent XAI medical imaging in healthcare
- Quantum computing with XAI and medical data fusion
- XAI-based intelligent solutions for healthcare systems
- Computer-aided diagnosis based on blockchain technology
- AI methodologies for medical data and image modalities

Information about special issue editors



Mazin Abed Mohammed is currently an associate professor at the University of Anbar in Iraq. He has a BSc degree in computer science from the University of Anbar, Iraq, Master of IT from the Universiti Tenaga Nasional Malaysia and PhD from the Universiti Teknikal Malaysia Melaka, Malaysia. He teaches a variety of university courses in computer science, such as Operating Systems, Database Design, Mobile Systems Programming, Software Project Management, Web Technologies and Software Requirements and Design. His areas of research interest include artificial intelligence, medical image processing, machine learning, computer vision, computational intelligence, IoT, biomedical computing, bioinformatics and fog computing. He has published in international journals and at conferences. Dr. Mohammed's outstanding scientific production spans over 90 contributions published in high-standard journals indexed in Web of

Science, such as IEEE Access, Future Generation Computer Systems, Medical Informatics, Computers & Electrical Engineering, Computational Science, and Medical Systems.



Seifedine Kadry is currently a full professor of Data Science at the Noroff University College in Norway. He received a BSc degree in 1999 from the Lebanese University, MSc degree in 2002 from the University of Reims (France) and the EPF Lausanne (Switzerland), PhD in 2007 from the Blaise Pascal University (France), HDR degree in 2017 from the University of Rouen Normandy (France). At present, his research focuses on data science, education using technology, system prognostics, stochastic systems and applied mathematics. He is an ABET program evaluator for computing and for engineering technology. He is a Fellow of IET, a Fellow of IETE, and a Fellow of IACSIT. He is a distinguished speaker of the IEEE Computer Society.



Oana Geman is currently an associate professor at the Ștefan cel Mare University of Suceava in Romania. She received a PhD degree in Electronics and Telecommunication from the Ștefan cel Mare University of Suceava, Romania, in 2005, and later also a habilitation degree. Within the past five years she has published ten books, over 70 articles (50 articles in Web of Science journals; 15 papers in ISI indexed conference volumes and 11 articles in Q1 and Q2 journals as the main author). She is a member of the steering committee of the Medical and Application Symposium and an Elsevier and Springer editor. She was the General Chair of sessions at international conferences in the field of sensors and instrumentation for Internet of Things (IoT) organized in 2019 (ISSI 2019 in Lisbon and AEIT 2019 in Guangzhou). She has been a director or a member in 12 national and international grants. Her current research interests include: non-invasive measurements of biomedical signals, wireless sensors, e-Health, telemedicine, signal processing, nonlinear dynamics analysis, classification and prediction, data mining, deep learning, intelligent systems, bioinformatics and biomedical applications.

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Important dates:

Deadline for manuscript submissions: **20 December 2022**

Notification to authors within four weeks.

Special issue will be published in June 2023.

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Relevant references

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