Tentative Outline

Title of the Thematic Issue: "Big Data, Machine Learning and Blockchain Techniques for Engineering Problems"

Guest Editor: *Dr. Wei Wei*

- **Scope of the Thematic Issue:**

At present, the complexity of the internet has dramatically increased, making it more important and challenging to solve various engineering problems including communication engineering, mechanical engineering, financial engineering, medical engineering, etc. The rapid growth of storage technologies in combination with some other factors, such as the appearance of mobile networks, digital society, and new technologies, has enabled the emergency of big data and blockchain in various engineering problems. However, as we know, big data is with a certain redundancy, while transmitting and processing these redundant data, the time and complexity will be increased dramatically. Redundant data in big data should also be compressed or removed by some techniques. Blockchain takes some new security issues. To handle the issues in blockchain, secure methods for data analytics is required in blockchain. Moreover, the application of big data and blockchain in some engineering problems including the network traffic monitoring, financial market analysis and medical data processing remains poorly understood and investigated.

To find a solution, machine learning (ML) techniques are proposed to handle the data in big data and blockchain, and also implement an intelligent analysis in various engineering problems such as face recognition, image processing, voice recognition, medical diagnoses, signal processing, DNA classification, social network, Internet of Things, and stock market analysis. ML is a collection of some computer algorithms that allow computer programs to improve automatically through experience for implementing an intelligent process. ML builds the model based on training data in engineering problems to make predictions or decisions without being explicitly programmed to do so. ML is also one of the main branches of artificial intelligence (AI), and it is accelerating the rapid developments in AI. Its primary objective is to use computer algorithms to extract information from data in engineering problems. With the help of big data, ML and blockchain, various engineering problems can be solved very well.

The aim of this thematic issue is to stimulate discussions on the design, use, and evaluation of big data, ML and blockchain for engineering problems. This thematic issue will bring together academics and industrial practitioners to exchange and discuss the latest innovations and applications.

Keywords: Big data, Machine learning, Artificial intelligence, Blockchain, Engineering problems, Industrial information

Sub-topics:

The topics of interest include, but are not limited to:
- Big data analysis frameworks for network traffic monitoring
- Big data analysis frameworks for smart energy, smart business and smart cities
- Big data analysis frameworks for intelligent transportation systems
- Big data analysis frameworks for Internet of Things
- Big data analysis frameworks for medical data
- Big data analysis frameworks for financial engineering
- Big data analysis frameworks for mechanical fault diagnosis
- Machine learning techniques for big data systems
- Machine learning techniques for image processing
- Machine learning techniques for computer vision
- Machine learning techniques for wireless sensor networks
- Machine learning techniques for social network
- Machine learning techniques for civil engineering
- Machine learning techniques for data mining
- Machine learning techniques for natural language processing
- Machine learning techniques for blockchain security
- Blockchain-based lightweight data structure for Internet of Things
- Blockchain for cloud/edge/fog computing
- Blockchain for cyber-physical systems
- Blockchain applications in financial trading
- Big data analytics with blockchain methodologies for secure Internet of Things

Schedule:

- Thematic issue submission deadline: **November 30, 2023**

Contacts:

Guest Editor Name: Dr. Wei Wei
Affiliation: Xi'an University of Technology, China
Email: weiwei@xaut.edu.cn