sustainability

MDPI

Editorial

Sustainable Development of Industrial Engineering with the Application of Intelligent Systems

Babek Erdebilli [1] and Erfan Babaee Tirkolaee [2,3,4,*]

[1] Department of Industrial Engineering, Ankara Yıldırım Beyazıt University, Ankara 06010, Turkey; berdebilli@aybu.edu.tr
[2] Department of Industrial Engineering, Istinye University, Istanbul 34396, Turkey
[3] Department of Industrial Engineering and Management, Yuan Ze University, Taoyuan 320315, Taiwan
[4] Department of Industrial and Mechanical Engineering, Lebanese American University, Byblos 13-5053, Lebanon
* Correspondence: erfan.babaee@istinye.edu.tr

This Special Issue focuses on Intelligent Systems (ISs) in the context of sustainable development for industrial engineering. ISs are utilized in healthcare, agriculture, transportation, energy, safety, and education. These mobile systems impact our daily lives. Edge computing brings processing and storage closer to the customer, hence reducing reaction times. Such disruptive innovations improve the quality of human life, but they must be sustainable in terms of natural resource usage and should not be detrimental to present or future generations. Due to their objective-oriented and adaptive qualities, ISs are applicable in virtually every sector. With the exponential increase in population and the continual decrease in resources (such as the land area for agriculture, labor, and water), Artificial Intelligence (AI) strategies and novel computing can maximize additional resources and deliver these applications to the fingertips of users.

To address the abovementioned requirements, this Special Issue, entitled "Sustainable Development of Industrial Engineering with the Application of Intelligent Systems", aimed to cover the latest research and innovations in healthcare decision support systems, weather forecasting, waste management, sustainable agriculture, traffic and pollution control applications, and safety and security applications. As a result, we received 34 manuscripts, and the majority of the submissions focused on the specified research topics for this Special Issue. Notably, 15 manuscripts underwent revisions as per the authors' requests and were subsequently accepted for publication in *Sustainability*, resulting in an average acceptance rate of approximately 44%.

The published manuscripts conducted a comprehensive analysis of decision-making methods, data analysis, optimization, and AI, consolidating the latest advancements in the sustainable development of ISs. These contributions aimed to enhance our understanding of effective practices within the framework of emerging economies and offer valuable practical insights. Here are the specific details of the contributions:

- Li (2022) addressed the potential effect of sustainability on the public health system of the elderly with the help of Internet of Things (IoTs). They used a classifier along with Every autoregressive moving average system (ARMAX) and Fast Fourier Transform (FFT) to conduct their study.
- Wu et al. (2022) utilized data from the World Input–Output Database (WIOD), covering 16 manufacturing industries across 43 countries from 2000 to 2014. They developed an econometric regression model to empirically examine the correlation between population aging, industrial intelligence, and the technological complexity of exports.
- A simulation–optimization model was developed by Song et al. (2022) in order to plan industrial heavy-duty trucks on the basis of fluid–structure coupling.

check for updates

Citation: Erdebilli, B.; Tirkolaee, E.B. Sustainable Development of Industrial Engineering with the Application of Intelligent Systems. *Sustainability* **2024**, *16*, 1928. https://doi.org/10.3390/su16051928

Received: 24 January 2024
Accepted: 22 February 2024
Published: 27 February 2024

- Bac (2022) offered a Fuzzy Multi-Criteria Group Decision-Making (F-MCGDM) model for the strategic alignment of Management Information System (MIS) functions in service and manufacturing industries.
- Fuzzy Best–Worst Method (F-BWM) and Fuzzy Additive Ratio Assessment Method (F-ARAS) were suggested by Boz et al. (2022) to appraise and rank sustainable suppliers in the healthcare industries in the era of Logistics 4.0.
- Cakmak (2023) employed Interval-Valued Neutrosophic (IVN) SWARA and EDAS methods in order to assess and prioritize sustainable suppliers of a power generator company in Turkey.
- A hybrid decision-making model based on Data Envelopment Analysis (DEA) and fuzzy COPRAS was offered by Yilmaz (2023) in order to evaluate renewable energy generation in wind farms of Turkey.
- Niekurzak et al. (2023) used a lean manufacturing scenario focusing on the consequences of reducing the changeover time within the assembly line on the overall efficiency of production, wherein production process optimization was conducted using the Single Minute Exchange of Die (SMED) method.
- Q-rung orthopair fuzzy TOPSIS and VIKOR methods were suggested by Erdebili et al. (2023) in order to evaluate and select the most sustainable private health insurance policies.
- Abbasi and Erdibili (2023) proposed a mathematical model in order to design a green closed-loop supply chain network considering different carbon policies during the COVID-19 pandemic.
- A hybrid fuzzy LMAW and Fermatean fuzzy WASPAS technique was developed by Sıcakyüz (2023) to assess online customer reviews.
- Wu et al. (2023) applied a Voxelization algorithm to reconstruct the data based on a reliability measure of the point cloud data generated from mmWave radars applied to posture classification for low-energy-consumption platforms.
- A simulation–optimization approach was suggested by Utku (2023) to evaluate and enhance the production processes of an automotive company manufacturing garbage collectors.
- Shao et al. (2023) introduced a high-order sliding mode flux observer utilizing a hybrid reaching rate. This approach was developed to address the excitation challenge in elevator traction permanent magnet synchronous motors.
- Zhu and Liu (2023) employed a Work Breakdown Structure–Risk Breakdown Structure (WBS-RBS) model to assess the risks of prefabricated building supply chains considering aspects of sustainability.

Acknowledgments: The Guest Editors express gratitude to Marc A. Rosen, the Editor-in-Chief of *Sustainability*, for his support with this Special Issue. Appreciation is also extended to all authors and referees for their valuable contributions. The dedicated volunteer efforts of the referees significantly influenced the quality of the accepted papers. Lastly, heartfelt thanks go to Contact Editor for enduring facilitation of administrative matters.

Conflicts of Interest: The authors declare no conflicts of interest.

List of Contributions:

1. Abbasi, S.; Erdebilli, B. Green closed-loop supply chain networks' response to various carbon policies during COVID-19. *Sustainability* **2023**, *15*, 3677.
2. Bac, U. Strategic Alignment of Management Information System Functions for Manufacturing and Service Industries with an F-MCGDM Model. *Sustainability* **2022**, *14*, 14428.
3. Boz, E.; Çizmecioğlu, S.; Çalık, A. A Novel MDCM Approach for Sustainable Supplier Selection in Healthcare System in the Era of Logistics 4.0. *Sustainability* **2022**, *14*, 13839.
4. Cakmak, E. Supplier Selection for a Power Generator Sustainable Supplier Park: Interval-Valued Neutrosophic SWARA and EDAS Application. *Sustainability* **2023**, *15*, 13973.

5. Erdebilli, B.; Gecer, E.; Yılmaz, İ.; Aksoy, T.; Hacıoglu, U.; Dinçer, H.; Yüksel, S. Q-ROF fuzzy TOPSIS and VIKOR methods for the selection of sustainable private health insurance policies. *Sustainability* **2023**, *15*, 9229.
6. Li, H. The Impact of Sustainable Development on the Public Health System of the Elderly in the Internet of Things Environment. *Sustainability* **2022**, *14*, 16505.
7. Niekurzak, M.; Lewicki, W.; Coban, H.H.; Bera, M. A Model to Reduce Machine Changeover Time and Improve Production Efficiency in an Automotive Manufacturing Organisation. *Sustainability* **2023**, *15*, 10558.
8. Shao, P.; Tang, X.; Zheng, B.; Li, D.; Chen, S.; Lin, H. High-Order Sliding Mode Magnetometer for Excitation Fault Detection of Elevator Traction Synchronous Motor under the Background of Industrial Engineering. *Sustainability* **2023**, *15*, 1239.
9. Sıcakyüz, Ç. Analyzing healthcare and wellness products' Quality embedded in online customer reviews: Assessment with a hybrid fuzzy LMAW and fermatean fuzzy WASPAS method. *Sustainability* **2023**, *15*, 3428.
10. Song, X.; Cao, F.; Rao, W.; Huang, P. Simulation Optimization of an Industrial Heavy-Duty Truck Based on Fluid–Structure Coupling. *Sustainability* **2022**, *14*, 14519.
11. Utku, D.H. The Evaluation and Improvement of the Production Processes of an Automotive Industry Company via Simulation and Optimization. *Sustainability* **2023**, *15*, 2331.
12. Wu, K.; Tang, Z.; Zhang, L. Population Aging, Industrial Intelligence and Export Technology Complexity. *Sustainability* **2022**, *14*, 13600.
13. Wu, J.; Cui, H.; Dahnoun, N. A voxelization algorithm for reconstructing MmWave radar point cloud and an application on posture classification for low energy consumption platform. *Sustainability* **2023**, *15*, 3342.
14. Yilmaz, I. A hybrid DEA–fuzzy COPRAS approach to the evaluation of renewable energy: A case of wind farms in Turkey. *Sustainability* **2023**, *15*, 11267.
15. Zhu, T.; Liu, G. A Novel Hybrid Methodology to Study the Risk Management of Prefabricated Building Supply Chains: An Outlook for Sustainability. *Sustainability* **2022**, *15*, 361.