


# Hybrid-Augmented Intelligent Systems: New Trends and Applications

## J.UCS Special Issue


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The recent advancements in Artificial Intelligence (AI) have profoundly transformed various aspects of our lives, from societal interactions to business operations and educational methodologies. As traditional AI systems grapple with challenges like transparency and the lack of human-centric adaptability, the concept of Hybrid-Augmented Intelligence emerges as a transformative approach. By integrating human cognitive capabilities with advanced computational systems, Hybrid-Augmented Intelligence aims to overcome such limitations, fostering collaboration and decision-making processes that leverage both human insight and machine precision. This special issue focuses on Hybrid-Augmented Intelligence methodologies and applications, exploring their potential to address modern challenges in Industry 4.0, healthcare, cybersecurity, robotics, and beyond.

The goal of this special issue is to consolidate pioneering research and practical implementations in the realm of Hybrid-Augmented Intelligent Systems. With this collection of articles, we aim to provide a platform for advancing the understanding of Hybrid-Augmented Intelligence while inspiring future research. This issue offers theoretical insights, methodological advancements, and application-driven case studies, demonstrating how Hybrid-Augmented Intelligence can drive innovation and efficiency across diverse domains.

This special issue encompasses five cutting-edge research articles in different related topics of the scope. Each paper is addressing a unique aspect of Hybrid-Augmented Intelligence. These contributions reflect the diversity and richness of current studies, focusing on topics ranging from decision-making frameworks and optimization techniques to applied case studies in real-world contexts. The articles included in this issue are described as follows.

1. The article *Finding Top-k Preferable Products for Customer-Oriented Marketing Based on the Outranking Approach: A case study on Mexican restaurants* by Juan Carlos Leyva López and Omar Alejandro Reyna Gutiérrez

from Mexico introduces a multicriteria framework to identify the top-k preferable products in targeted marketing strategies. By leveraging the ELECTRE III method, the authors showcase an effective approach for intelligent recommending products based on customer preferences. The framework is validated through a case study on Mexican restaurants, offering insights into how multicriteria decision-making can enhance customer-oriented marketing strategies. The results highlight the practical implications of outranking methods in optimizing personalized marketing efforts.

2. The paper *A Preference-based Food Recommendation Model for Diabetes* by Manuel J. Barranco, Raciél Yera and Francisco J. Martínez from Spain presents an innovative food recommendation system tailored to the dietary needs of diabetic patients. Integrating medical guidelines and user preferences, the framework generates nutritionally balanced and personalized meal plans. The study emphasizes the balance between health promotion and user satisfaction, using experimental evaluations to demonstrate the system's effectiveness. The research addresses a critical gap in e-health tools for managing chronic diseases, paving the way for broader adoption in personalized nutrition.
3. The third contribution *Red-Light Running Detection* by Thien Doanh Le, Duc Luan Dang, Thi Quynh Nhu Duong and Kha Tu Huynh from Vietnam focuses on enhancing road safety. This paper proposes a system for detecting red-light violations using the YOLOv8 deep learning model. The approach combines object detection with real-time analysis of CCTV footage from Vietnamese intersections. With high accuracy and efficiency, the system demonstrates its potential for deployment in traffic management, offering a scalable and cost-effective solution for reducing traffic violations and improving urban mobility.
4. The study *A Transparent and Ecologically Sustainable DLT-based Approach for Tendering Processes* by Francisco J. Quesada-Real, Francisco Moya-Pérez, Mercedes Rodríguez-García and Bapi Dutta from Spain explores the use of Distributed Ledger Technologies (DLTs) to improve transparency and ecological sustainability in public tendering processes. Utilizing the IOTA framework, the authors propose a cost-effective, environmentally friendly system that enhances transparency while reducing transaction fees and carbon footprints. The paper highlights the significance of integrating advanced digital frameworks with traditional processes to achieve more sustainable and trustworthy systems.
5. The last paper *Integer Programming, Low Complexity Heuristics and Gaussian Instances for the Internet Shopping Optimization Problem with multiple item Units (ISHOP-U)* by Fernando Ornelas, Alejandro H. García, Alejandro Santiago, Salvador Ibarra Martínez, José Antonio Castán Rocha, Fausto Balderas, Julio Laria-Menchaca and Mayra Guadalupe Treviño-Berrones from Mexico addresses the Internet Shopping Optimization Problem by introducing a novel combination of integer programming and low-

complexity heuristics. By modeling realistic scenarios with Gaussian-distributed product prices, the study demonstrates improvements in efficiency and accuracy compared to existing approaches. The contributions emphasize the importance of optimization techniques in tackling complex e-commerce challenges.

We extend our deepest gratitude to the authors for their valuable contributions and to the reviewers for their meticulous feedback, which ensures the high quality of this issue. Special thanks go to the editorial team of the Journal of Universal Computer Science for their unwavering support and guidance throughout this process. We hope this issue serves as a source of inspiration and a foundation for further advancements in Hybrid-Augmented Intelligent Systems.

List of reviewers:

Yilena Pérez Almaguer  
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