

## Guest Editorial

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# Introduction to the special issue of International Conference on New Technologies, Artificial Intelligence and Smart Data

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### 1. Background

We are delighted to present this special issue of the *Journal of Smart Cities and Society* dedicated to the best papers presented at the International Conference on New Technologies, Artificial Intelligence and Smart Data (INTIS 2023) that was held in Tangier, Morocco, May 26-27, 2023. INTIS is an international conference where researchers and practitioners from academia and industry come together to share and discuss the latest advances, solutions, and trends in the domain of data technologies, artificial intelligence, and smart cities. The keynote speakers at INTIS 2023 were Prof. Marjan Mernik (domain-specific languages), Dr. Sandro Bimonte (supervision and monitoring of autonomous agricultural robots), and Prof. Mohamed Esssaïdi (sustainable smart cities for SDGs acceleration). INTIS 2023 featured three distinguished keynote speakers who shared their expertise:

1. Prof. Marjan Mernik from the University of Maribor in Slovenia delved into the “Formal and Practical Aspects of Domain-Specific Languages.”
2. Dr. Sandro Bimonte, associated with TSCF, INRAE, Clermont-Ferrand, France, offered insights into “New Supervision and Monitoring of Agricultural Autonomous Robots: From Design to Implementation.”
3. Prof. Mohamed Esssaïdi, representing the Moroccan School of Science & Engineering (EMSI) in Casablanca, Morocco, expounded on the concept of “Sustainable Smart Cities for SDGs Acceleration.”

This special issue was managed as follows: The conference organizers invited the authors of the best papers to submit their work to this special issue of the *Journal of Smart Cities and Society*. Subsequently, all submissions were peer-reviewed by at least two reviewers from our international program committee consisting of academia specializing in the diverse subjects covered by our special issues. After the second round of reviews, we ultimately accepted three papers for publication. We congratulate the authors of these three papers and express our gratitude to all authors who submitted articles to INTIS 2023.

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The three selected papers are summarized as follows:

The first paper, “Machine learning-based data cleaning: Solutions and challenges”, by Sanae Borrohou, Rachida Fissoune and Hassan Badir, comprehensively explores data cleaning and outlier detection, emphasizing their importance in machine learning. It delves into the profound significance of data cleaning and delineates its underlying processes. Moreover, it provides a comprehensive overview of outlier detection techniques, categorizing them into statistics-based, distance-based, and model-based approaches. In addition to this, the authors introduce a novel algorithm that combines the Isolation Forest model with a clustering algorithm. This innovative approach involves partitioning the dataset into subsets using the K-means clustering algorithm and subsequently applying the Isolation Forest algorithm to each of these subsets. This strategy not only reduces the number of generated subsets but also addresses issues related to anomaly score calculation, particularly concerning path length calculation. The results of this approach are promising, with the proposed algorithm achieving an impressive accuracy rate of 98%. However, it is worth noting that this enhanced performance comes at the expense of increased time complexity.

The second paper titled, “Optimized robust control based ACO technique for two links robot”, by Siham Mas-sou, introduces an innovative approach to robustly control a two-link robot. It combines sliding mode control and neural networks to address non-linear dynamics and prevent chattering. An Ant Colony Optimization (ACO) algorithm optimizes the neural network’s learning rate for faster convergence. Adaptive laws based on the Lyapunov stability approach update network weights, reducing response time during online training. Simulation results show smooth control performance without chattering. This article is highly relevant, addressing a significant challenge in robotics and automation. The integration of sliding mode control and neural networks offers a promising solution for handling uncertainties. The ACO algorithm adds a systematic approach to enhance neural network-based control.

The third paper titled, “Revolutionizing engineering education: Creating a web- based teaching platform for immersive learning experiences”, by Houda Mouttalib, Mohamed Tabaa and Mohamed Youssefi, proposes a new approach for integrating immersive technologies, such as virtual reality (VR) and augmented reality (AR), into higher education. This platform would be based on WebXR, a technology that allows developers to create immersive content that can be accessed on a variety of devices, including smartphones, tablets, and VR headsets. The authors demonstrate that this new platform has the potential to transform engineering education by providing students with more engaging and effective learning opportunities. For example, students could use VR to explore virtual laboratories and factories, or AR to visualize complex engineering concepts. This could help students to better understand and retain the material, and to develop the skills they need to be successful in their careers.

The contributions featured in this special issue have a profound impact on the development of smart cities. They offer solutions for more efficient data cleaning, precise robotics control, and the integration of immersive technologies in education, all of which are crucial elements in advancing the smart city agenda. These innovations promote data accuracy, technological advancement, and a highly skilled workforce, thereby contributing significantly to the realization of smarter and more resilient urban development.

## **Acknowledgements**

The guest editors of this special issue would like to express their sincere gratitude to all authors who submitted their papers to the issue. We hope that the readers of this volume will find the content interesting and inspiring, and that it will motivate them to look further into the challenges that still lie ahead in smart cities. We also express our great esteem to the reviewing committee for the time and effort they put in reviewing these papers. We would like to thank the Editor-in-Chief, Juan Carlos Augusto, for the opportunity to edit this special issue related to innovation in smart cities, his assistance during the special issue preparation, and for giving the authors the opportunity to present their work in the journal. Last but not least, we wish to thank the journal’s staff for their assistance and suggestions.