

Editorial

In this issue, we present a diverse collection of 13 accepted papers covering a wide range of topics within the realms of technology, robotics, education, renewable energy, communication systems, medical imaging, logistics, and storytelling. These papers contribute valuable insights to their respective fields, offering innovative solutions, experimental results, and practical implications.

The first paper addresses the growing demand for connected devices in the Narrow-band Internet of Things (NB-IoT) and presents a novel Symbol Time Compression (STC) based approach to double the number of connected devices while maintaining system performance. The proposed method efficiently utilizes the available bandwidth, reducing the occupied bandwidth of each device without compromising complexity or performance [1].

The second paper delves into the realm of soft robotics, focusing on the design and manufacturing of soft grippers for robotics using injection molding technology. The study introduces a strategy for optimizing injection molding to enable mass production of soft grippers, paving the way for more cost-effective and commercially viable soft robotic solutions [2].

Moving underwater, the third paper introduces a selective modal analysis algorithm for localizing impulsive sound sources in shallow waters. The proposed algorithm utilizes modal dispersions to enhance the accuracy and noise-resistivity of sound source localization, offering a 2D localization method with minimal hardware requirements in a noisy underwater environment [3].

Shifting gears to the field of education, the fourth paper investigates the impression effects of a teacher-type robot equipped with a Perplexion Estimation Method on college students. The study introduces an autonomous learning support approach that estimates students' states of perplexity through facial expressions, demonstrating the potential for enhancing learning environments [4].

Next, the fifth paper presents a fuzzy Maximum Power Point Tracking (MPPT) technique for photovoltaic systems based on custom defuzzification. The proposed method addresses the nonlinearity of solar modules and demonstrates improved performance compared to traditional MPPT methods [5].

The sixth paper takes a circuit designer's perspective to Metal Oxide Semiconductor Field-Effect Transistors (MOSFETs) behavior, offering a comprehensive explanation of MOSFET behavior and providing practical insights into interpreting AC parameters in modern MOSFET models [6].

In the realm of renewable energy, the seventh paper introduces a novel approach for frequency control support of a wind turbine generator using Proportional Derivative (PD) and Proportional Integral Derivative (PID) controllers. The study demonstrates the effectiveness of the proposed controllers in maintaining system stability and frequency within acceptable limits [7].

The eighth paper addresses the distribution management problem in the Moroccan petroleum sector, presenting a heuristic solution for the Vehicle Routing Problem with Time Windows (VRPTW). The study aims to minimize transport costs and optimize the number of trucks to improve the competitiveness of transportation operations [8].

Moving to medical imaging, the ninth paper focuses on MRI semantic segmentation based on an optimized V-net with 2D attention. The study explores deep learning models for accurate tumor segmentation in brain MRI images, demonstrating an effective approach for the diagnosis of oncological brain diseases [9].

The tenth paper shifts to the realm of communication systems, presenting the FPGA implementation of 5G NR LDPC codes. The study showcases the implementation of 5G NR LDPC codes on a FPGA platform, demonstrating high coding gain, throughput, and low power dissipation [10].

The eleventh paper explores the application of lean practices in the food supply chain in Morocco. The study assesses the implementation status of lean practices in agri-food companies, emphasizing their impact on both operational and environmental performance [11].

In the twelfth paper, the authors propose colorized iVAT images for labeled data as a visualization technique for higher-dimensional data sets. The study introduces new types of colorized iVAT images to represent spatial cluster structures and the distribution of labels among clusters in data sets of dimensions 4 or greater [12].

Finally, the thirteenth paper introduces "Seven ReImagined," a transmedia storytelling evolution proposal that reshapes the exploration of the seven deadly sins in a modern context. The project creatively blends traditional art with cutting-edge immersive technologies, fostering a multifaceted dialogue on ancient moral wisdom in contemporary society [13].

In summary, this issue showcases a diverse range of papers that contribute significantly to their respective fields, offering innovative solutions, experimental results, and practical implications for researchers, practitioners, and enthusiasts alike.

References:

- [1] A. Mohammed, M.S. Elbakry, H. Mostafa, A.A. Ammar, "Doubling the Number of Connected Devices in Narrow-band Internet of Things while Maintaining System Performance: An STC-based Approach," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 1–10, 2023, doi:10.25046/aj080401.
- [2] H.D. Bryantono, M.R.F. Saduk, J. Hong, M.-H. Tsai, S.-C. Tseng, "Design and Manufacturing of Soft Grippers for Robotics by Injection Molding Technology," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 11–17, 2023, doi:10.25046/aj080402.
- [3] F. Talebpour, S. Mozaffari, M. Saif, S. Alirezaee, "Localization of Impulsive Sound Source in Shallow Waters using a Selective Modal Analysis Algorithm," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 18–27, 2023, doi:10.25046/aj080403.
- [4] K. Okawa, F. Jimenez, S. Akizuki, T. Yoshikawa, "Investigating the Impression Effects of a Teacher-Type Robot Equipped a Perplexion Estimation Method on College Students," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 28–35, 2023, doi:10.25046/aj080404.
- [5] A. Allaoui, M.N. Tandjoui, C. Benachaiba, "Fuzzy MPPT for PV System Based on Custom Defuzzification," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 36–40, 2023, doi:10.25046/aj080405.
- [6] R. Sommer, C.T. Gatermann, F. Vierling, R. Sommer, "A Circuit Designer's Perspective to MOSFET Behaviour: Common Questions and Practical Insights," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 41–59, 2023, doi:10.25046/aj080406.
- [7] A.A. Jhumka, R.T.F.A. King, C. Ramasawmy, A. Khodaruth, "Proportional Derivative and Proportional Integral Derivative Controllers for Frequency Support of a Wind Turbine Generator in a Diesel Generation Mix," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 60–65, 2023, doi:10.25046/aj080407.
- [8] Y.F. El Bahi, L. Ezzine, Z. Aman, I. Moussaoui, M. Rahmoune, H. El Moussami, "Distribution Management Problem: Heuristic Solution for Vehicle Routing Problem with Time Windows (VRPTW) in the Moroccan Petroleum Sector," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 66–72, 2023, doi:10.25046/aj080408.

- [9] Z.H.N. Al-azzwi, A.N. Nazarov, "MRI Semantic Segmentation based on Optimize V-net with 2D Attention," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 73–80, 2023, doi:10.25046/aj080409.
- [10] S.F. Abdel-Momen, A.H.A. Zekry, A.Y. Hassan, W.I. Shaban, M.M. Shiple, "FPGA Implementation of 5G NR LDPC Codes," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 91–100, 2023, doi:10.25046/aj080411.
- [11] F. Bouhannana, A. El Korchi, "Application of Lean Practices in Food Supply Chain: The Case of Morocco," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 101–110, 2023, doi:10.25046/aj080412.
- [12] E.D. Hathaway, R.J. Hathaway, "Colorized iVAT Images for Labeled Data," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 111–121, 2023, doi:10.25046/aj080413.
- [13] J. Braguez, "SEVEN ReImagined: A Transmedia Storytelling Evolution Proposal," *Advances in Science, Technology and Engineering Systems Journal*, **8**(4), 122–130, 2023, doi:10.25046/aj080414.

Editor-in-chief

Prof. Passerini Kazmersk