Editorial

We are pleased to present the third issue of the sixteenth volume of the ***Journal of Electronic Systems*****,** featuring the following papers.

In the opening article, "**Development and Comprehensive Analysis of a Synthetic Power-Thermal Dataset for AI-Driven ECU Design Optimization and Risk Classification**," the authors introduce a novel synthetic dataset designed for AI-driven Electronic Control Unit (ECU) optimization. Generated via physics-informed simulations, the dataset comprises over 15 electrical, thermal, and composite variables reflecting realistic ECU operating conditions. Through rigorous statistical analysis, the study identifies the primary physical drivers of thermal stress and risk behavior. Ultimately, this work establishes a foundational benchmark for next-generation ECU design, demonstrating that physics-aware synthetic datasets paired with hybrid AI architectures can effectively facilitate real-time, safety-compliant optimization.

The second paper, "**Empirical Noise Profiling and Dimensionality Reduction of Raw Triaxial Acceleration Data in Consumer-Grade MEMS Sensors**," offers a comprehensive empirical analysis of raw, high-frequency triaxial acceleration data acquired from an MPU-6050 sensor under controlled, static conditions. The analytical framework employs descriptive statistics, dual-method anomaly detection (Interquartile Range and Z-score), and Principal Component Analysis (PCA) to rigorously evaluate signal integrity and multivariate covariance structures. These findings successfully validate the efficacy of PCA-based dimensionality reduction and targeted, axis-specific filtering.

In the final study, "**High-Resolution Smart Meter Load Forecasting in Morocco: Model Performance, Diagnostics, and Interpretability Analysis for Laâyoune Zone 1,"** the authors develop and evaluate a high-resolution, interpretable load forecasting framework using 10-minute smart meter data from Laâyoune Zone 1, Morocco. To capture complex temporal dependencies, the research team engineered advanced features, including lag variables, rolling statistics, and cyclical time encodings. The authors demonstrate that this explainable ensemble framework provides utility operators with a robust, transparent, and computationally efficient tool, thereby facilitating demand response, anomaly detection, and sustainable energy management in modern smart grid environments.

We hope the research presented in this issue significantly contributes to the ongoing advancement of electronic engineering.

Editors