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Editorial

Advancing intelligent, sustainable, and secure engineering systems for future technologies

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ABSTRACT

This editorial introduces Volume 41, Number 1, January 2026, of the Indonesian Journal of Electrical Engineering and Computer Science (IJEECS), highlighting pivotal research trajectories expected to influence future progress in electrical engineering and computer science. Instead of covering all aspects of the field, this issue is structured around three strategic macroclusters: intelligent and sustainable engineering systems, AI-driven healthcare and human-centered technologies, and secure, comprehensible, and interconnected intelligent infrastructure. These themes show how artificial intelligence, sustainability, and security are coming together more and more in modern engineering applications. The editorial talks about how important intelligent energy systems, advanced control and hardware solutions, data-driven healthcare innovations, and reliable digital infrastructures are for solving global technological problems. This issue's contributions demonstrate IJEECS's dedication to publishing significant, cross-disciplinary research that bridges theory and practice. This issue of the journal makes it clear that it is a progressive platform that wants to promote smart, long-lasting, and safe technologies for the engineering systems of the future.

The rapid growth of electrical engineering and computer science is still changing how modern society deals with difficult technological problems. The merging of the physical and digital worlds has sped up thanks to improvements in AI, renewable energy systems, smart control, and secure digital infrastructures. In this context, scholarly journals have more responsibilities than just keeping track of technical progress. They also need to provide strategic direction and support research that has a lasting impact on science and society. Volume 41, Number 1, January 2026 of the Indonesian Journal of Electrical Engineering and Computer Science (IJEECS) exemplifies this responsibility by showcasing research that corresponds with evolving global imperatives while upholding rigorous engineering principles. Instead of focusing on how different fields are breaking up, the articles in this issue all point to three macro-clusters that are related: Intelligent and Sustainable Engineering Systems, AI-Driven Healthcare and Human-Centred Technologies, and Secure, Explainable, and Connected Intelligent Infrastructure. These clusters signify areas where innovation is both imperative and revolutionary and where forthcoming research will profoundly influence the trajectory of engineering science.

Intelligent and Sustainable Engineering Systems

The first macro-cluster talks about how intelligence is becoming more and more a part of sustainable engineering solutions. As energy systems move towards renewable generation and electrification becomes more common, power systems have to work with more uncertainty, variability, and complexity. The research in this issue talks about how to solve these problems by making progress in power electronics, integrating renewable energy, machine dynamics, energy storage systems, and smart control strategies. The use of

predictive and adaptive control methods, multi-level inverter designs, and techniques for improving stability shows that intelligent algorithms are now a necessary part of modern power and energy systems. At the same time, advances in electronic materials and low-power circuits demonstrate the need to prioritise how important it is for components to be efficient and last a long time. These contributions together show a big-picture view of sustainability that includes materials, devices, systems, and control. This makes electrical engineering a key part of future energy transitions.

AI-Driven Healthcare and Human-Centered Technologies

The second macro-cluster shows how AI is changing healthcare and other applications that put people first. Machine learning and deep learning methods have become very useful for analysing biological signals, medical images, diagnosing diseases, and predicting health. The articles in this volume show how advanced models, hybrid architectures, and optimised learning strategies can be used to solve real-life healthcare problems with greater accuracy and reliability. This group holds significance as it transcends technical performance, concentrating on design that prioritises people and is pertinent to society. Studies on assistive technologies, monitoring educational engagement, cognitive assessment, and personalised learning show how intelligent systems can be made to meet the needs of different users. These studies show that there is a bigger trend towards engineering solutions that put ethics, usability, and inclusivity first. IJEECS reinforces its dedication to interdisciplinary research that connects engineering innovation with real benefits for people's health by putting AI-driven healthcare and human-centered technologies at the forefront.

Secure, Explainable, and Connected Intelligent Infrastructure

The third macro-cluster addresses the fundamental requirements for the large-scale implementation of smart systems, including security, trust, and connectivity. With the expansion of digital infrastructures driven by IoT, edge computing, and next-generation communication networks, ensuring their safe and reliable operation is increasingly critical. The contributions within this volume examine cybersecurity threats, smart detection systems, secure communication protocols, and data protection frameworks across various application areas. The growing emphasis on explicable and reliable artificial intelligence is also understandable. As AI-driven systems integrate into essential infrastructures and decision-making processes, it is crucial that they remain transparent and comprehensible, allowing users to trust and hold them accountable. Researchers focusing on explainable machine learning and security-focused system design are increasingly realising the need to combine technical expertise with ethical engineering practices. Recent advancements in low-power networking, wireless communication, and connected embedded systems further illustrate how intelligent infrastructure can achieve a balance of performance, efficiency, and scalability. Collectively, these contributions indicate that secure and connected infrastructures are not merely enablers of technology but are vital components of future engineering systems.

Strategic Outlook and Call for Papers

The research presented in this issue illustrates the increasing interconnectedness of engineering as a discipline. Intelligence, sustainability, and security emerge as overarching principles that transcend traditional disciplinary boundaries. The articles in Volume 41, Number 1, indicate a distinct shift towards system-level thinking, whereby engineering solutions are evaluated not only on their technical efficacy but also on their flexibility, robustness, and societal benefits. This edition of the IJEECS reaffirms its commitment to being an international journal that anticipates future developments and publishes significant, high-quality research in electrical engineering and computer science. The editorial board acknowledges that the topics explored will continually evolve in response to emerging technologies and global challenges.

In light of this, IJEECS invites researchers, scholars, and professionals to submit original research articles for forthcoming issues. We particularly welcome submissions that address smart and sustainable engineering systems, AI-driven healthcare, human-centred technologies, and secure, user-friendly, interconnected infrastructures. We have a preference for interdisciplinary works that apply research to real-world challenges while advancing theoretical frameworks and resolving practical issues. IJEECS is dedicated to serving as a trustworthy platform for the exchange of research that enhances understanding and influences the direction of engineering science. This commitment is reflected in our rolling submission process and rigorous peer-review standards. The editorial board extends its gratitude to the authors and reviewers whose contributions made this issue possible, and they look forward to collaborating with the global research community in the future.