

Advanced Energy and Industrial IoT

Zagdkhorol Bayasgalan, Bat-Erdene Byambasuren and Uranchimeg Tudevdağva

Call for submission. This editorial introduces the issue of 2023 for *Embedded Selforganising Systems (ESS)* journal. This issue focuses on a discussion about *Advanced Energy and Industrial IoT* in different areas of engineering solutions.

Our journal uses electronic publication, which provides a flexible way to submit and review the contributions of authors from all countries. The advantages of such an e-journal are multifarious. We replace the classic review and creation process with a new Sliding Issue model compared to traditional paper journals. Each issue starts with an initial editorial and an official call for papers. The submitted articles will be reviewed and, if accepted, published as soon as the committee receives the final version. Based on this process, each sliding issue can be filled successively until the maximum number of articles is reached. During this period, other researchers can already read accepted papers while other papers are still in the reviewing process—accordingly, the time to publish shrinks to a minimum. In addition, multiple issues with different focuses can co-exist at the same time, which provides completely new possibilities to react to the latest research topics. The journal also allows the integration of discussions and other reactions to published articles in the same journal issue.

We are welcoming fresh ideas, on-going research technical reports and novel scientific works. We also intend to create a promising platform for creative and constructive discussions.

Advanced Energy and Industrial IoT

The Internet of Things (IoT) has been enforced in different industries, including the electrical sector and the broader industrial landscape. IoT offers immense potential for enhanced electrical system monitoring, control, and optimization by seamlessly connecting devices, sensors, and equipment to the Internet. This issue explores IoT's current realization and implementation in electrical and industrial sectors and its impact on them. Additionally, it delves into the crucial connection between IoT, relay protection, and automation, highlighting the benefits of

this integration in terms of efficiency, reliability, and safety. Furthermore, this issue explores perspectives and adaptations of IoT in the energy and industry sectors. The realization of IoT in electrical systems and the industry sector holds significant promise. As IoT technology continues to evolve, it will enable the seamless integration of various components within electrical systems and industrial processes. This integration will lead to intelligent automation, streamlined workflows, and real-time decision-making, improving operational efficiency, productivity, and resource optimization. The convergence of IoT, electrical systems, and the industry sector will create an intelligent ecosystem that redefines traditional practices and establishes a foundation for sustainable growth and competitiveness.

Specific strategies must be considered to effectively implement IoT in electrical systems and connect it with relay protection and automation. First, robust and reliable infrastructure must be in place to support deploying IoT devices, sensors, and communication networks, including scalable connectivity, sufficient bandwidth, and secure cloud-based platforms for data storage and analysis. Interoperability and standardization are critical for integration among IoT devices, relay protection systems, automation equipment, and industrial processes. Common protocols and standards ensure the compatibility and interoperability of diverse systems, simplifying data exchange and facilitating collaboration among stakeholders. Security is paramount when implementing IoT in electrical systems and the industry sector. Comprehensive security measures, including encryption, authentication, and intrusion detection systems, must be in place to protect IoT-enabled systems, safeguard sensitive data, and mitigate cybersecurity risks.

Integrating IoT into electrical systems, relay protection, and automation has significant implications. IoT makes real-time monitoring of power consumption, grid performance, and equipment health possible. Based on data, this approach improves energy management and maintenance planning and enables predictive maintenance, resulting in cost savings, less downtime, and optimized

asset performance. IoT-driven automation and connectivity lead to intelligent, interconnected systems in the industry sector. IoT-enabled sensors and devices provide real-time data on production efficiency, equipment performance, and supply chain logistics. This data allows proactive decision-making, optimized workflows, and streamlined operations, which increases productivity and reduces operational costs.

Looking ahead, the future perspectives of IoT in the energy and industry sectors are promising. IoT-enabled smart grids will revolutionize energy distribution in the energy sector, enabling optimized demand-response management, efficient renewable energy integration, and enhanced grid stability. IoT devices will empower consumers with real-time energy consumption data, enabling them to make informed decisions, reduce energy waste, and contribute to a more sustainable energy landscape. IoT will continue to drive automation and digital transformation in the industry sector.

Advanced analytics and machine learning algorithms will leverage IoT data to enable predictive maintenance, optimize production processes, and ensure resource efficiency. In the industry sector, IoT-driven automation and connectivity will enable the development of smart factories and Industry 4.0 concepts. IoT sensors collect real-time data from machines, processes, and supply chains, allowing for predictive maintenance, intelligent scheduling, and agile production. This will result in enhanced productivity, reduced downtime, improved quality control, and optimized resource utilization.

Furthermore, adopting IoT in the energy and industry sectors will pave the way for new business models and opportunities. Data-driven insights from IoT devices and analytics will enable companies to offer value-added services, predictive maintenance solutions, and energy management consultancy. The trend will foster innovation, competitiveness, and sustainable growth in the digital economy. IoT's future realization and implementation in electrical systems and the industry sector hold great potential for transformative changes. Through the integration of IoT with relay protection, automation, and advanced data analytics, electrical systems and industrial processes can achieve improved efficiency, reliability, and sustainability. Embracing IoT technologies and harnessing their power in the energy and industry sectors will unlock

new possibilities for growth, innovation, and a more connected and intelligent future.

We would like to express our deep gratitude for your attention and support in presenting the current issue, which showcases some noteworthy research results from the Department of Electric Techniques, Power Engineering School, Mongolian University of Science and Technology.

Once again, we extend our heartfelt appreciation to Prof. Hardt, the esteemed faculty, and our department colleagues for support in presenting this current issue. We are confident that the research findings shared herein will contribute to the advancement of the field and pave the way for future breakthroughs.

SUBMISSION INSTRUCTIONS

Submissions for the journal must be made as complete papers (there is no abstract submission stage) submitted as PDF documents. Authors are requested to submit papers reporting original research results and experience. The page limit for regular papers is 4 to 6 pages and short papers are from 2 to 4 pages. Papers should be prepared using the IEEE two-column template. An MS Word template or ESS online journal is available here <https://www.bibliothek.tu-chemnitz.de/ojs/index.php/cs/information/authors>

Papers should submit the following link of the journal:

<https://www.bibliothek.tu-chemnitz.de/ojs/index.php/cs/about/submissions>

Submission period: Opening June 2023 and Closing 30th October 2023.

There is no charge for submission. Accepted papers are publishing free. Review in 2 weeks after submission. Camera-ready paper for publication should be submit in 2 weeks after review notes.

Thank you for Your Contribution!