



Editorial

Preface of 3rd IEEE International Conference on Electronic Communications, Internet of Things and Big Data 2023 (IEEE ICEIB 2023)[†]

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This volume represents the proceedings of the 3rd IEEE International Conference on Electronic Communications, Internet of Things, and Big Data 2023 (IEEE ICEIB 2023). This conference was organized by Asia University, the Institute of Electrical and Electronics Engineers (IEEE), and the International Institute of Knowledge Innovation and Invention (IIKII), and was held at Asia University, Taichung, Taiwan, on 14–16 April 2023. The conference provided a unified communication platform for researchers on a wide range of topics such as big data and cloud computing, technologies and applications of artificial intelligence, robotics science and engineering, the Internet of Things and sensor technology, intelligent big data analysis and applications, and other related fields. In recent years, the rapid development of electronic technology and microelectronic technology has fundamentally and universally brought about the new technology revolution. The continuous revolution of electronic technology has not only appeared in very large-scale integrated circuits (VLSIs) and computers, but has also contributed to the development of modern communication technologies. Electronics and communication engineering involve information and communication systems, electronic science and technology, communication and information systems, signal and information processing, circuits and systems, electromagnetic fields and microwave technology, physical electronics and optoelectronics, microelectronics, and solid-state electronics, to name a few. Related research content includes information transmission, information exchange, information processing, signal detection, integrated circuit design and manufacture, electronic components, microwave and antenna, instrumentation technology, computer engineering, application, and others. The analysis and application of big data improve the efficiency of existing products and allow new products to be developed. Recent technological breakthroughs have greatly reduced the cost of data storage and computing, making the storage of huge amounts of data considerably less complicated and expensive than in the past. With the volume of data increasing day by day and being coupled with lower costs and easier access, using big data helps in making more precise business decisions that previously have been difficult.

IEEE ICEIB 2023 was held in a hybrid form, featuring on-site and online presentations. Figure 1 shows the group photo from the conference's opening. The first keynote speech was "Towards Net Zero: Opportunities and Challenges from a Materials Scientist's Perspective" presented by Professor Li-Chyong Chen, an academican of Academia Sinica, Taiwan. He emphasized that the discovery and development of materials for clean energy were essential to accelerate the transition toward a carbon-neutral economy. For instance,



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photocatalytic CO₂ conversion to hydrocarbon fuels, or so-called artificial photosynthesis, enables simultaneous solar energy harvesting and CO₂ reduction reactions (CO₂RRs), and so it is considered a killing-two-birds-with-one-stone approach to solving the energy and environmental problems. Advanced future points were made by showing selective cases of scanning probe-based microscopies and in situ/operando synchrotron radiation-based spectroscopies along with vibrational spectroscopies. These enable scientists to probe the geometric, bonding, and electronic information of the catalyst and obtain atomic insights into the catalytic surfaces and reaction mechanisms. The second keynote speech was about “Asia University’s Smart Campus Development”, and was presented by Chair Professor Shian-Shyong Tseng, the Vice President of Asia University, Taiwan. Firstly, he briefly introduced the smart campus of Asia University and explained how the smart campus was built using the artificial Internet of Things (AIoT) as well as data and knowledge engineering skills. With such a well-established strategy, Asia University started to build the infrastructure and then developed the application and service processes. In the meantime, Asia University enhanced the quality, performance, and interactivity of campus services. The speech presented several examples of the various applications, especially those focusing on smart learning.



Figure 1. Group photo at the opening ceremony of IEEE ICEIB 2023.

IEEE ICEIB 2023 provided five regular sessions and seven invited sessions, covering various cutting-edge IoT technology fields, including big data, artificial intelligence (AI), robotics, IoT, cloud computing, global concerns about sustainable wisdom, and other issues. Figures 2 and 3 show examples of on-site and online oral presentation sessions.

Many substantial results were shared at IEEE ICEIB 2023 by enthusiastic participants, and 89 excellent papers on engineering fields related to the conference were selected through peer review for the publication of the proceedings of IEEE ICEIB 2023. The proceedings are expected to accelerate the interdisciplinary collaboration of science and engineering technologists in the academic and industrial fields and encourage international networking.



Figure 2. Presentation at an on-site session of IEEE ICEIB 2023.



Figure 3. Online presentation of IEEE ICEIB 2023.

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