SPECIAL ISSUE ON NEXT-GENERATION CIRCUITS AND SYSTEMS

Kei Eguchi*

Department of Information Electronics
Fukuoka Institute of Technology
3-30-1 Wajiro-higashi, Higashi-ku, Fukuoka 811-0295, Japan
eguti@fit.ac.jp

In the fifth science and technology basic plan, Society 5.0 was proposed as a future society in Japan. For Society 5.0, the development of new engineering technologies is necessary to solve the social problems, such as promotion of sustainable industrialization and elimination of labor shortages, increase in food production and reduction in food losses, and reduction of social costs for aging society. The aim of this special issue is to explore the design requirements of next-generation circuits and systems to solve above-mentioned problems. The ideas of the submitted papers come with a potential to help us solve some of our most pressing important challenges. The submitted papers were reviewed at least by two professionals to comply with the quality demanded by *ICIC Express Letters, Part B: Applications* editorial board. After solid reviews and revisions, nine papers are accepted to be published in this special issue. Certainly, the published papers demonstrate the results of the state-of-the-art research in the development of next-generation circuits and systems. The first paper entitled as "Proposal of 2-Input SHL Circuit with FG Calibration", contributed by Hayato Yagi, Riku Ohtsuka and Masaaki Fukuhara, presents a new soft-hardware-logic (SHL) circuit designed using neuron MOS transistors. The second paper, "A Multi-Input Single Output (MISO) Buck Converter Design by Switched-Capacitor (SC) Techniques", presented by Daigo Nakashima, Wanglok Do, Takaaki Ishibashi and Kei Eguchi, describes a novel multi-input single output (MISO) ac/dc converter for vibration energy harvesting. The third paper entitled as "Digital Frequency-Locked Loop Based on Double-Edge Counter", written by Mitsutoshi Yahara, Kuniaki Fujimoto, Daishi Nishiguchi and Yujiro Harada, proposes a novel digital frequency-locked loop (DFLL) based on double-edge counter for next-generation mobile communication devices. The fourth paper is named "Blind Source Separation Based on Estimation for the Number of Sources and Target Speech Selection" in which Takaaki Ishibashi and Kei Eguchi propose a new estimation method for the number of the source signals under a two-microphone configuration. The fifth paper entitled as "Blind Source Separation for Human Speeches Based on Orthogonalization of Joint Distribution of Observed Mixture Signals", written by Takaaki Ishibashi and Kei Eguchi, deals with a real-time blind source separation (BSS) method for human speech signals. Authored by Wanglok Do, Akira Shibata and Kei Eguchi, the sixth paper addresses "Design of a Bipolar Cascade Voltage-Doubler for a Non-Thermal Food Processing System Using Underwater Shockwave" to provide low cost non-thermal food processing technology for aging society. Authored by Kriangsak Prompak, Pimonwan Phoomsrikaew, Anucha Kaewpoonsuk and Noppadon Sisuk, the seventh paper addresses "Development of Automatic Fall Detection Device for Old People Based on 3-Axis Accelerometer Sensor with Mobile IoT System" to prevent falls and fractures in older persons. The eighth paper, "A Simple Electrical Conductivity Measurement System Based on Arduino", authored by Ratchanoo Katman and Anucha Kaewpoonsuk,

*Guest Editor for the Special Issue on Next-Generation Circuits and Systems

implements a simple electrical conductivity measurement system into a low-cost embedded device. The last paper, "Automatic Blood Pressure for Wearable Health Monitoring Using IoT Technology", presented by Anucha Kaewpoonsuk, Sukkan Sudtana, Kriangsak Prompak and Noppadon Sisuk, provides high-accuracy wearable healthcare monitoring for blood pressure and heart rate. We hope this special issue motivates researchers to explore the theory and practices of next-generation circuits and systems in future.

Finally, we sincerely thank the contributive authors and reviewers for their dedicated efforts on excellent works. Also we all appreciate deeply Editor-in-Chief of *ICIC Express Letters, Part B: Applications*, Professor Yan Shi, for his hard work to make the special issue possible and premium.