Guest Editorial: Special Issue on Selected Papers From IEEE BioCAS 2019

THIS special issue of the IEEE TRANSACTIONS ON BIOMEDICAL CIRCUITS AND SYSTEMS presents a selection of high-quality research papers from the 2019 IEEE Biomedical Circuits and Systems Conference (BioCAS) in Nara, Japan, from October 17–19, 2019. Similar to previous years, BioCAS 2019 was jointly sponsored by the IEEE Circuits and Systems (CAS) Society and the IEEE Engineering in Medicine and Biology (EMB) Society.

At the crossroads of medicine, life sciences, physical sciences and engineering, exciting interdisciplinary research, and development activities are taking place that shape tomorrow's healthcare and well-being. The BioCAS conference serves as a premier international forum for these activities. Under the conference theme of "*Intelligent symbiosis of man and machine to improve health*," BioCAS 2019 received a total of 275 papers from all over the world with 132 from Asia/Pacific, 73 from Europe, 52 from North America, and 18 from other regions. Submissions were in all Bio-CAS tracks, with the largest being Biosignal Recording, Processing, and Machine Learning, followed by Biosensor Devices and Interface Circuit. Out of these, only 165 top papers were accepted after a thorough review process, resulting in an acceptance rate of 60%.

The papers in this special issue were selected out of a total of 165 accepted papers based on technical review scores from independent experts worldwide who reviewed these papers for the conference program. Multiple rounds of peer review in the TRANSACTIONS resulted in the following 11 papers for this special issue. The papers cover several topics and can be combined in 4 broad categories of Biosignal Recording, Processing, and Machine Learning; Biomedical Imaging and Image Processing; Bio-telemetry and Wireless/Wearable Health Monitoring; and Implantable Medical Electronics, as outlined below.

A) Biosignal Recording, Processing, and Machine Learning: Novel signal-processing approaches for compression of neural and physiological signals and machine learning.
   - Sensor-Array Optimization Based on Time-Series Data Analytics for Sanitation-Related Malodor Detection by J. Zhou *et al.*
   - A Study of Personal Recognition Method Based on EMG Signal by J. Mao *et al.*
   - ResOT: Resource-Efficient Oblique Trees for Neural Signal Classification by B. Zhu *et al.*

B) Biomedical Imaging and Image Processing: Biosensing systems that can be directly attached to human skin with novel energy-harvesting schemes and wireless transmission for healthcare applications, as well as ultrafast lock-in CMOS image sensors that can be applied to fluorescence lifetime imaging microscopy.
   - A Low Power and Real-time Architecture for Hough Transform Processing Integration in a Full HD-Wireless Capsule Endoscopy by O. Chuquimia *et al.*
   - Motion Correction in Multimodal Intraoperative Imaging by F. Chen *et al.*
   - Low-Cost Multi-Wavelength Photoacoustic Imaging Based on Portable Continuous-wave Laser Diode Module by F. Gao *et al.*

C) Bio-telemetry and Wireless/Wearable Health Monitoring: Microelectronic circuits for acquiring, conditioning, and processing physiological signals as well as for data transmission and remote powering of implanted medical devices:
   - Wireless User-Generic Ear EEG by R. Kaveh *et al.*
   - Binary CorNET: Accelerator for HR Estimation From Wrist-PPG by D. Biswas *et al.*

D) Implantable Medical Electronics: Microelectronic circuits for biomedical applications that can be implanted in living creatures.
   - Fully Integrated Time-Gated 3D Fluorescence Imager for Deep Neural Imaging by J. Choi *et al.*
   - A Chip Integrity Monitor for Evaluating Moisture/Ion Ingress in mm-Sized Single-Chip Implants by O. C. Akgun *et al.*
   - Design of a Low Noise Bio-Potential Recorder With High Tolerance to Power-Line Interference Under 0.8 V Power Supply by M. Zhang *et al.*

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