

Call for Papers: IEEE Trans. Biomed. Circ. Syst. (TBioCAS)

Special Issue: Ultralow-power Technologies for Edge Computing in Human-Machine Interface Applications

Scope and Topics:

Wearable devices are a growing technology that have carved out a significant space in healthcare applications and in human-machine interfaces. This technology can be comfortably worn on the body and permits users to monitor various activities/biometrics and to determine human body status. However, despite their widespread application, wearable devices are facing various challenges such as low computing capability, high power consumption, high amounts of data to be transmitted, and low data rates in wireless links. To improve energy efficiency and ensure long-lasting battery-based operation, the processing of the sensors' output should be moved to the edge, next to the sensors. By combining edge computing, smart sensors, and low-power circuits in both analog and digital domains, it is possible to design ultralow-power technologies with extreme energy efficiency.

In this special issue, we would like to collect articles on ultralow-power technologies in any aspect of the pipeline, as this will have a profound impact on next-generation challenges and future directions related to edge computing for wearable healthcare applications. Original research manuscripts on recent advances in circuits and systems, as well as reviews/perspectives of emerging technologies aiming to reduce power consumption, are welcome for this special issue.

Topics of interest include, but are not limited to:

- Human-machine interface (brain/nerves/muscles)
- Smart wearable sensors
- Distributed sensors for efficient body area networks
- Analog and digital circuits for in-memory, in-sensor, and edge computing
- Flexible and wearable electronics
- Neuromorphic edge computing
- Low-power radar chips
- Wearable ultrasound and photoacoustic devices
- Novel ultralow-power technologies for sensing and/or stimulation
- Hardware-software co-design approaches for smart edge processing

To be considered in scope, submissions to the IEEE TBioCAS must demonstrate synergies between circuits, systems, and medicine/biology.

Guest Editors:

Dr. Elisa Donati, University of Zurich and ETH Zurich, Switzerland

Dr. Phillip Nadeau, Analog Devices, Boston, USA

Dr. Simone Benatti, University of Modena and Reggio Emilia, Italy

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Key Dates:

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