SBCCI'2020 Guest Editorial

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The Symposium on Integrated Circuits and Systems Design (SBCCI) is an international forum dedicated to Integrated Circuits and Systems Design, Test and Electronic Design Automation (EDA), held annually in Brazil. The SBCCI has established itself as an important international forum for the presentation of advanced research results on leading-edge aspects of integrated circuits and systems design, such as Analog circuits, Mixed-signal and Digital Integrated Circuits Design, Dedicated and Reconfigurable Architectures, EDA tools, Design Methods, Embedded Systems, System-on-chip, and Nanoarchitectures, as well as Verification and Test Methods. This 33rd edition of SBCCI was planned to take place in Campinas, 100 km distant from São Paulo, but due to the Covid-19 pandemic, it was transformed into a virtual event.

This Special Section contains extended versions of the best papers presented at the SBCCI'2020. The papers have been again refereed along the usual refereeing process in force at the Analog Integrated Circuits and Signal Processing Journal. We are proud to offer these papers to the readers of this journal now. Eight papers have been finally selected, covering a variety of topics related to the event, including:

- Reconfigurable computing: “*Fast DSE of Reconfigurable Accelerator Systems via Ensemble Machine Learning*”. Adoption of machine learning to simplify and speed up the design space exploration of general-purpose processors with reconfigurable hardware accelerators.
- Analog and radiofrequency design: (1) “*A sinusoidal current generator and a TEB decomposer for measuring bioimpedance in a cardiac pacemaker, using an analog wavelet filter*”, describes a sinusoidal signal generator for

thoracic bioimpedance measurement system and signals decomposition filter, based on an analog wavelet filter approach; (2) “*A Multimode CMOS PA with a Single Propagation Path*”, presents a four mode 130 nm RF CMOS power amplifier (PA) in a single propagation path topology, evaluated with IEEE 802.11ax signals; (3) “*Low-Voltage Dynamic Comparator Using Positive Feedback Bulk Effect on a Floating Inverter Amplifier*”, presents the design of a low voltage dynamic comparator for low-power ADC applications using a pre-amplifier powered by a floating reservoir capacitor and a positive feedback bulk structure; (4) “*Evaluating analog arithmetic circuit for approximate computing with DNA strand displacement*”, proposes and evaluates an approach to solve the leaks effects on multiplication analog gate found in the literature.

- Security: “*Process-Variation Aware Design Optimization of an Integrated Microprobe Detector*”. Invasive attacks in integrated systems make use of microprobes to sense information in specific bus lines. This paper proposes a multi-objective optimization-based methodology to optimize the silicon area, robustness, and parametric manufacturing yield of a microprobe detector.

- Video Coding: (1) “*Asynchronous Time-Based Imager with DVS Sharing*”. In the asynchronous time-based image sensor (ATIS) pixel, capture is performed when a significant luminance change is detected. The ATIS disadvantages are large pixel area and low fill factor. The paper proposes the design of an ATIS module in which a block of capture modules shares the dynamic vision sensor (DVS) module. (2) “*Hardware and Coding Efficiency Assessment of 3D-HEVC DIS Tool Using Alternative Similarity Criteria*” proposes substituting the complex SVDC criterion for straightforward and more hardware-friendly criteria as SATD, SSE, and SAD.

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Author contributions We hope that you enjoy these contributions as much as we did.

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Fernando Gehm Moraes – SBCCI Program Chair, Leading Guest Editor. Received the Electrical Engineering and M.Sc. degrees from the Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, Brazil, in 1987 and 1990, respectively. In 1994 he received the Ph.D. degree from the Laboratoire d'Informatique, Robotique et Microélectronique de Montpellier (LIRMM), France. He is currently at PUCRS, where he has been an

Associate Professor from 1996 to 2002 and Professor since 2002. From 1998 to 2000, he joined the LIRMM as an Invited Professor for three months each year. He has authored and co-authored 45 peer-refereed journal articles in the field of VLSI design, including the development of networks-on-chip and telecommunication circuits. He has also authored and co-authored more than 200 conference papers on these topics. He advised 30 MSc, and 16 Ph.D. works. His primary research interests include Microelectronics, reconfigurable

architectures, NoCs and MPSoCs (multiprocessor system on chip), and security. IEEE Senior Member.

Bernardo Leite – SBCCI Publication Chair, Guest Editor. Received the electrical engineering degree at Universidade Federal do Paraná (UFPR) in Curitiba, Brazil, the M. Sc. degree in electronic engineering at ENSEIRB, in Talence, France, and the Ph.D. degree in electronics at the University of Bordeaux, France. From 2007 to 2012, he was a researcher within the STMicroelectronics-IMS Bordeaux joint laboratory and, since 2012, Bernardo Leite has

been a professor at UFPR and a member of the Group of Integrated Circuits and Systems (GICS). His research activities focus on the design of radiofrequency and millimeter-wave CMOS power amplifiers and on-chip transformers.