

Special issue: highlights from the IEEE Latin American Symposium on Circuits and Systems (LASCAS) 2014

Fernando Silveira¹ · Alfredo Arnaud² · Victor Grimblatt³

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We are very pleased to present to the readers of the Springer Journal on Analog Integrated Circuits and Signal Processing a selection of extended papers from the 5th edition of the IEEE Latin America Symposium on Circuits and Systems LASCAS 2014, held in Santiago de Chile, Chile, from Feb. 26th to 28th, 2014. 155 papers coming from authors from 32 countries, 22 of them from outside Latin American, were submitted to the conference. After a thorough review process 83 papers were accepted for presentation at the conference and publication in the IEEE LASCAS Proceedings. Based on the evaluations of the Program Committee members and the corresponding session chairs, a total of 22 of these works were invited to submit a substantially extended and revised manuscript to this Special Issue of LASCAS 2014. These papers went through a second-round of peer-review process and 14 papers were finally selected for this Special Issue. These contributions cover a wide range of topics within the scope of the journal, from analog circuit design to image and analog signal processing techniques and up to digital techniques and biomedical system design.

In the analog circuit design domain, the papers deal with analog to digital conversion: *A 2GS/s 6-bit CMOS Time-Interleaved ADC for Analysis of Mixed-Signal Calibration Techniques* by Benjamín T. Reyes et al., voltage references: *Sub-1 V Supply 5 nW 11 ppm/C Resistorless Sub-Bandgap Voltage Reference* by Oscar E. Mattia et al. and ultra low-voltage oscillators: *Analysis and Design of a Fully-Integrated Colpitts Oscillator Operating at Ultra-Low-Voltages* by Marcio Bender Machado et al. Two papers address topics on analog circuits for power management: *A Series-Parallel Switched Capacitor Step-Up DC-DC Converter and its Gate-Control Circuits for Over the Supply Rail Switches* by Pablo Pérez-Nicoli et al and *A Power Management System Architecture for LF Passive RFID tags* by Fernando Paixão Cortes et al. One paper analyzes techniques for energy harvesting: *Electrostatic energy harvesting using capacitive generators without control circuits* by Antonio Carlos M. de Queiroz. Device modeling with analog application is considered in *A fully symbolic homotopy-based memristor model for applications to circuit simulation* by Arturo Sarmiento et al. Analog signal processing is dealt with in *Two-Dimensional Analog Signal Processing and Its Implications on Circuit Theory* by Shervin Erfani et al., and image and video processing in *CMOS Imager with Current-Mode Sub-Band Image Coding at the Focal Plane* by Bruno Bastos Cardoso et al and *Towards Optimal Use of Pel Decimation to Trade off Quality for Energy* by Ismael Seidel et al. Two works are related to digital techniques: *High-Performance Elliptic Curve Cryptoprocessors over GF(2^m) on Koblitz Curves* by Paulo C. Realpe-Muñoz et al and *Automatic Complex Instruction Identification for Efficient Application Mapping onto Application-Specific Instruction Set Processors* by Alexandre S. Nery et al. Two papers are related to biomedical system design: *A Novel 915 MHz, RFID-based*

✉ Fernando Silveira
silveira@fing.edu.uy

Alfredo Arnaud
aarnaud@ucu.edu.uy

Victor Grimblatt
Victor.Grimblatt@synopsys.com

¹ Instituto de Ingeniería Eléctrica, School of Engineering, Universidad de la República, Montevideo, Uruguay

² Departamento de Ingeniería Eléctrica, Universidad Católica del Uruguay, Montevideo, Uruguay

³ Synopsys, Santiago de Chile, Chile

Pressure Sensor for Glaucoma using an Electrically Small Antenna by Andre Faul et al and *Lab-on-Phone: A Participatory Sensing System* by Jorge Mario Garzon Rey et al.

We deeply thank the authors that prepared the extended papers for this special issue and the reviewers that contributed to the quality of the issue through their comments and suggestions. We would like to express our appreciation to Dr. Mohammed Ismail, Editor-in-chief of the Journal, for the opportunity to organize this special issue, and to the assistance of Raja Chinnadurai from the Springer Journal Editorial Office and Shenbagam Selvaraj, from the Springer Journals production for their diligent work and help. We hope you appreciate this special issue.



Fernando Silveira received the Electrical Engineering degree from Universidad de la República, Uruguay in 1990 and the M.Sc. and Ph.D. degree in Microelectronics from Université catholique de Louvain, Belgium in, respectively, 1995 and 2002. He is Professor at Universidad de la República, Uruguay, where he is currently the Head of the Electrical Engineering Department. His research interests are in design of ultra low-power analog and RF integrated

circuits and systems, in particular with biomedical application. In this field, he is co-author of one book and many technical articles and advised Masters and PhD thesis. He has acted as invited plenary speaker at various events and served as reviewer and member of the TPC of several journals and conferences. He has multiple industrial activities with CCC Medical Devices and NanoWattICs, including leading the design of an ASIC for implantable pacemakers, applied in industrial production and designing analog circuit modules for implantable devices for various companies worldwide (USA, Israel, Europe and Canada). These devices, which are currently on the market or under human clinical evaluation, are mainly related to the cardiovascular and neural fields. Dr. Silveira received the Distinguished Engineer award by the Uruguayan Association of Engineers in 2007 and was a member for 2011–2012 of the Distinguished Lecturers Program of the IEEE Circuits and Systems Society.



Alfredo Arnaud received his Ph.D., and M.Sc. in microelectronics from Universidad de la República—Uruguay, in 2000 and 2004 respectively. Since 2004 he joined Electrical Engineering Department at Universidad Católica del Uruguay, where he started the mDIE research group. Dr. Arnaud, has participated since 1997 in several research and development projects in the field of microelectronics and electronics for the industry, and in the Univer-

sity. His area of expertise is analog and mixed-mode circuit design

(low-noise, low-voltage, low power design) for implantable medical, and portable applications including RFID, medical, and compact/portable POS devices, and MOS transistor modeling (noise, mismatch). Dr. Arnaud holds two patents and as an academic he published more than 60 papers in international journals and scientific meetings and participated in 20 funded R&D projects. Dr Arnaud is the co-founder of two technology companies in Latin America: BQN in 2004 dedicated to electronics and software development for POS, medical, RFID devices and traceability within de agribusiness industry, and Chipmate in 2009 a spin-off of the mDIE aimed at the design of ASICs for medical devices and others. For the industry, he led the design teams of three ASICs for implantable medical devices, and embedded electronics like portable POS equipment, a USB dynamic medical scale, and a portable RFID reader according to ISO11784/11785 standard.



Victor Grimblatt was born in Viña del Mar, Chile. He has an engineering diploma in microelectronics from Institut Nationale Polytechnique de Grenoble (INPG France) and an electronic engineering diploma from Universidad Técnica Federico Santa Maria (Chile). He is currently R&D Group Director and General Manager of Synopsys Chile, leader in Electronic Design Automation (EDA). He opened the Synopsys Chile R&D Center in 2006. He has

expertise and knowledge in business and technology and understands very well the trends of the electronic industry; therefore he is often consulted for new technological business development. Before joining Synopsys he worked for different Chilean and multinational companies, such as Motorola Semiconductors, Honeywell Bull, VLSI technology Inc., and Compass Design Automation Inc. He started to work in EDA in 1988 in VLSI Technology Inc. where he developed synthesis tools being one of the pioneers of this new technology. He also worked in embedded systems development in Motorola semiconductors. In 1990 he was invited by professor McCluskey to present his work in Logic Synthesis at the CRC Stanford University. He has published several papers in EDA and embedded systems development, and since 2007 he has been invited to several Latin American Conferences (Argentina, Brazil, Chile, Mexico, Peru and Uruguay) to talk about Circuit Design, EDA, and Embedded Systems. From 2006 to 2008 he was member of the Chilean Offshoring Committee organized by the Minister of Economy of Chile. In 2010 he was awarded as Innovator of the Year in Services Export. In 2012 he was nominated to best engineer of Chile. He is also member of several Technical Program Committees on Circuit Design and Embedded Systems. Since 2012 he is chair of the IEEE Chilean chapter of the CASS. Victor Grimblatt is from 2002 professor of Electronics and IC Design in Universidad de Chile and Universidad de los Andes.