

2023 IEEE 14th Latin America Symposium on Circuits and Systems (LASCAS 2023)

**Quito, Ecuador
28 February – 3 March 2023**



**IEEE Catalog Number: CFP23LAS-POD
ISBN: 978-1-6654-5706-4**

**Copyright © 2023 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP23LAS-POD
ISBN (Print-On-Demand):	978-1-6654-5706-4
ISBN (Online):	978-1-6654-5705-7
ISSN:	2330-9954

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

Voltage Regulation in a Buck Converter for an Unknown CPL: An Extended Feedback Control Design	1
<i>Federico Martin Serra, Walter Gil, Oscar Danilo Montoya Giraldo and Jesus C. Hernandez</i>	
Active inductors modelling and trade-offs reexamined	5
<i>Andrés Seré, Leonardo Barboni, Sylvain Bourdel and Fernando Silveira</i>	
A Radiation Hardened Smart Power Switch Based on SOI Technology	9
<i>Ronald Hassib Galvis Chacón, Eduardo Gherghi de Carvalho, Jair Lins de Emeri Junior, Ângela Alves dos Santos, Paula Cristiane Secheusk, José Alexandre Diniz and Saulo Finco</i>	
Design of an ECG front-end considering ST-segment distortion	13
<i>Béatrice Guénégo, Caroline Lelandais-Perrault, Émilie Avignon-Meseldzija, Gérard Sou and Philippe Bénabès</i>	
DNAr-analog: a library with a multiplexer to easily design, program, and simulate DSD analog circuits	17
<i>Poliana A. C. Oliveira, Renan A. Marks, João V. C. Teixeira, Marcos V. Guterres and Omar P. Vilela Neto</i>	
Quantitative Information Flow for Hardware: Advancing the Attack Landscape.....	21
<i>Lennart M. Reimann, Sarp Erdönmez, Dominik Sisejkovic and Rainer Leupers</i>	
High-Speed Sampler for UWB Breast Cancer Detection System.....	25
<i>Lucas M. M. de Almeida, Bruno Sanches and Wilhelmus Adrianus M. Van Noije</i>	
Accelerated Hot-Carrier Aging Based on Ultrafast Laser for CMOS Technologies	29
<i>Ricardo Ascazubi</i>	
A Compact Analogue Counter for Single Photon Imagers.....	32
<i>Soumya Shatakshi Panda and Bhaskar Choubey</i>	
Efficient Architecture for VVC Angular Intra Prediction based on a Hardware-Friendly Heuristic	36
<i>Vinicius Borges, Murilo Perleberg, Marcelo Porto and Luciano Agostini</i>	
A Fast Cold-Start Integrated System for Ultra-Low Voltage SC Energy-Harvesting Circuits	40
<i>Luís Felipe Machado Dutra, Paulo César Comassetto de Aguirre, Alessandro Gonçalves Girardi and Lucas Compassi Severo</i>	
Hardware Design for the Affine Motion Compensation of the VVC Standard.....	44
<i>Marcello Munoz, Denis Maass, Murilo Perleberg, Luciano Agostini and Marcelo Porto</i>	
Performance Benchmarking of FinFET- and TFET-Based STT-MRAM Bitcells Operating at Ultra-Low Voltages	48
<i>Santiago S. Pérez, Alesandro Bedoya, Luis Miguel Procel and Ramiro Taco</i>	

Parkinson's Treatment Emulation Using Asynchronous Cellular Neural Networks	56
<i>Ioannis K. Chatzipaschalis, Karolos-Alexandros Tsakalos, Georgios Sirakoulis and Antonio Rubio</i>	
Design of Quasi Delay Insensitive Combinational Circuits Based on Optimized DIMS	60
<i>Duarte Oliveira, Marcus Victor Jr., Luiz Moreira and Felipe Nascimento</i>	
Error Resilience Evaluation of Approximate Storage in the Motion Compensation of VVC Decoders	64
<i>Renira Soares, Matheus Isquierdo, Felipe Sampaio, Amir Rahmani, Nikil Dutt, Daniel Palomino and Bruno Zatt</i>	
Multi-Size Inverse DCT-II Hardware Design for the VVC Decoder	68
<i>Bruna Garcia, Bianca Silveira, Claudio Diniz, Daniel Palomino and Guilherme Correa</i>	
High-Throughput and Multiplierless Hardware Design for the AV1 Fractional Motion Estimation	72
<i>Robson Domanski, William Kolodziejcki, Wagner Penny, Marcelo Porto, Bruno Zatt and Luciano Agostini</i>	
Using Lyapunov Exponents to Estimate Sensitivity to Process Variability	76
<i>Elias de Almeida Ramos and Ricardo Reis</i>	
Analysis and Design of a Self-Powered VEH System Based on ULP Comparator	80
<i>Eduardo Holguín, Luis Miguel Procel, Alexis Brenes, Andrei Vladimirescu and Lionel Trojman</i>	
Compact Time-Based Sensor-to-Digital Converters in Skywater 130nm Open-Source Technology	84
<i>Jorge Marin, Ioannis Vourkas, Joel Gak and Christian Rojas</i>	
Design and evaluation of CNN hardware accelerator designs for in-seat passenger anomaly detection	88
<i>Avik Bhatnagar, Pratyush Nandi and Madhav Rao</i>	
A Self Oscillating Current-Reuse Image Reject Mixer for Ultra Low Power Receivers	92
<i>Abhilash Reddy Yedala and Sankaran Aniruddhan</i>	
An Energy-Efficient StEFCal VLSI Design with Approximate Squarer and Divider Units . .	96
<i>Morgana Macedo Azevedo da Rosa, Patricia da Costa, Guilherme Paim, Eduardo Da Costa, Rafael Soares and Sergio Bampi</i>	
An RF-EH Employing Controlled-Impedance Matching for Ultra-Low Voltage Batteryless Devices	100
<i>Tailize Cordeiro De-Oliveira, Raul Pedrotti de Oliveira, Alessandro Girardi, Paulo César Comassetto de Aguirre and Lucas Compassi-Severo</i>	
The Fault-tolerant Single-FPGA Systems with a Self-repair Reconfiguration Controller . .	104
<i>Richard Pánek and Jakub Lojda</i>	
Pico-Ampere Current Biasing Platform for on-chip Tuning of Analog Blocks	108
<i>Germán Fierro and Fernando Silveira</i>	

Thermal energy harvesting to power a battery-less node of a wireless sensor network.....	112
<i>Sofía Boselli, Romina Gaudio, María Pía Grilli, Fernando Silveira and Mariana Siniscalchi</i>	
Deep Learning-Based Receiver Energy Prediction in Energy Harvesting Wireless Sensor Network	116
<i>El-Hadi Zazoua, Wessam Ajib and Mounir Boukadoum</i>	
Stacked-Cascode Current Steering Architecture for Gallium Nitride Variable-Gain LNAs..	125
<i>Jorge Luis González Rios, Diego Vázquez García de la Vega, Robson Luiz Moreno, Juan Carlos Merlano Duncan, Ole Kiel Jensen, Symeon Chatzinotas and Björn Ottersten</i>	
Minimizing Power Consumption Through Brute Force Algorithm in Elastic Optical Network	129
<i>Sabi Yari Moïse Bandiri, Francisco Souza Filho, Souleymane Diakite, Max Frejus Sanya, Herman Pereira and Tales Pimenta</i>	
Design and Evaluation of Inexact Computation based Systolic Array for Convolution	133
<i>Sai Karthik Nandigama, Prashanth H C and Madhav Rao</i>	
Analysis of AV1 Arithmetic Decoder Design Space with a Novel Multi-Boolean Approach.	137
<i>Jiovana Sousa Gomes, Tulio Pereira Bitencourt, Sergio Bampi and Fábio Luís Livi Ramos</i>	
On the Bode Diagram Plot of Switched Converters Using MATLAB Simulink - a Tutorial Approach	141
<i>Daniel M Barrera Leguizamón, Robert Urbina, Carlos Paez, Arturo Fajardo and Gabriel Perilla</i>	
Concise Memory Organization for a Customizable Hardware Design of a Quantum Coprocessor	145
<i>Nadia Nedjah, Luiza de Macedo Mourelle and Sérgio Raposo</i>	
Programmable Seizure Detector Using a 32-bit RISC Processor for Implantable Medical Devices	149
<i>Keyvan Farhang Razi and Alexandre Schmid</i>	
Self-Calibrating Circuit for Implantable Current Stimulators.....	153
<i>Natalia Martínez, Matías Miguez, Juan Sapriza, Joel Gak and Alfredo Arnaud</i>	
Complexity and Coding Efficiency Assessment of AOMedia Video 1	157
<i>Icaro Siqueira, Guilherme Correa and Mateus Grellert</i>	
Extended Feedback Linearization Control for Voltage Regulation in a Buck Converter with an Unknown Resistive Load.....	161
<i>Oscar Danilo Montoya Giraldo, Walter Julián Gil González, Federico Martin Serra, Cristian H. De Angelo and Jesus C. Hernández</i>	
A Wide-Band High-Speed Sample and Hold in 0.35 μm CMOS Technology	165
<i>Mateus Moreira, Hervé Lapuyade, François Rivet and Yann Deval</i>	
Neutron Irradiation of Si-PIN Diodes and Laser Injection Equivalence	169
<i>Ricardo Ascazubi, Rogelio Palomo, Jose Manuel Quesada Molina, Victoria Navarrete, Miguel Cortes and Jose Antonio Pavon</i>	

A low-complexity experimental characterization of the neodymium magnet grade	173
<i>Luis Baron, Robert Alexis Urbina Mojica, Carlos Paez, Arturo Fajardo and Manuel Pérez</i>	
Novel measurement method to estimate the main resonance of a Power Distribution Network	177
<i>Marie Peyrard, Gilles Jacquemod, Nicolas Froidevaux and Mélanie Moign</i>	
Design-oriented model for short-channel MOS transistors based on inversion charge	182
<i>Dayana Andrea Pino Monroy, Patrick Scheer, Mohamed Khalil Bouchoucha, Carlos Galup Montoro, Manuel Barragan, Philippe Cathelin, Jean-Michel Fournier, Andreia Cathelin and Sylvain Bourdel</i>	
STT-MRAM Technology For Energy-Efficient Cryogenic Memory Applications	186
<i>Esteban Garzon, Leonid Yavits, Adam Teman and Marco Lanuzza</i>	
Security Implications of Decoupling Capacitors on Leakage Reduction in Hardware Masking	190
<i>Soner Seckiner and Selcuk Kose</i>	
Exploring Multi-Parameter Optimization of Automated HLS Tools and the Difficulty of Setting Complex Constraints	194
<i>Noam Shalom and Itamar Levi</i>	
Overview of Cryogenic Operation in Nanoscale Technology Nodes	199
<i>Noam Roknian, Yonatan Shoshan, Inbal Stanger, Adam Teman, Edoardo Charbon and Alexander Fish</i>	