

2016 IEEE International Conference on Electronics, Circuits and Systems (ICECS 2016)

**Monte Carlo, Monaco
11-14 December 2016**



**IEEE Catalog Number: CFP16773-POD
ISBN: 978-1-5090-6114-3**

**Copyright © 2016 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:	CFP16773-POD
ISBN (Print-On-Demand):	978-1-5090-6114-3
ISBN (Online):	978-1-5090-6113-6

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

ICECS 2016 Table of Contents

A1L-A Emerging Technologies

Date: Monday, December 12, 2016

Time: 11:00 - 12:40

Room: Apollinaire-1

Chair(s): Amara Amara; ISEP, France

Demonstration of 2:4 GHz Vector Modulator for RF Wireless Systems on cellulose-Based Substrates 1

Federico Alimenti¹, Chiara Mariotti², Maicol Silvestri¹, Valentina Palazzi¹, Marco Virili¹, Paolo Mezzanotte¹, Luca Roselli¹

¹Università degli Studi di Perugia, Italy; ²Università degli Studi di Perugia / Infineon Technologies AG Austria, Italy

An Integrated Rad-Hard Test-Vehicle for Embedded Emerging Memories 5

Nicola Lupo³, Cristiano Calligaro², Christian Wenger¹, Franco Maloberti³

¹IHP GmbH, Germany; ²RedCat Devices, Italy; ³Università degli Studi di Pavia, Italy

Geometric Variability Impact on 7nm Trigate Combinational Cells 9

Alexandra Lackmann Zimpeck², Ygor Aguiar², Cristina Meinhardt¹, Ricardo Reis²

¹Universidade Federal do Rio Grande, Brazil; ²Universidade Federal do Rio Grande do Sul, Brazil

Device Matching Measurements in 28nm Technology for High Energy Physics Experiments 13

Moataz Elkhayat², Stefano Mangiarotti², Claudio De Berti², Marco Grassi², Piero Malcovati², Domenico Albano³, Andrea Baschiroto¹

¹Università degli Studi di Milano-Bicocca, Italy; ²Università degli Studi di Pavia, Italy; ³Università della Calabria, Italy

2-V Turn-on Voltage Field-Emitting Vacuum Nanoelectronic Device 17

Davide Patti¹, Giovanni Castorina², Salvatore Pennisi²

¹STMicroelectronics, Italy; ²Università degli Studi di Catania, Italy

A1L-B Analog-to-Digital Converters

Date: Monday, December 12, 2016

Time: 11:00 - 12:40

Room: Auric-2

Chair(s): Franco Maloberti; *University of Pavia, Italy*

A Low-Power Time-Based Phase-Domain Analog-to-Digital Converter 21

Mina Assarzadeh², Mehdi Saberi², Mohammad Tohidi¹, Farshad Moradi¹

¹*Aarhus University, Denmark*; ²*Ferdowsi University of Mashhad, Iran*

A 6-Bit, Two-Step, Successive Approximation Logarithmic ADC for Biomedical Applications 25

Yuwadee Sundarasaradula², Timothy Constandinou¹, Apinunt Thanachayanont²

¹*Imperial College London, United Kingdom*; ²*King Mongkut's Institute of Technology Ladkrabang, Thailand*

Experimental Demonstration of Stochastic Comparators for Fine Resolution ADC Without Calibration 29

Nguyen Ngoc Mai-Khanh², Rimon Ikeno², Takahiro J. Yamaguchi¹, Tetsuya Iizuka², Kunihiro Asada²

¹*Advantest Laboratories, Japan*; ²*University of Tokyo, Japan*

Mismatch and Parasitics Limits in Capacitors-Based SAR ADCs 33

Yulin Zhang¹, Edoardo Bonizzoni², Franco Maloberti²

¹*Institute of Microelectronics of Chinese Academy of Science, China*; ²*Università degli Studi di Pavia, Italy*

A 30Gsps 6bit DAC in SiGe BiCMOS Technology 37

Lei Zhou¹, Weizhong Li², Danyu Wu¹, Fan Jiang², Daojun Xue², Jin Wu¹, Xinyu Liu¹

¹*Institute of Microelectronics of Chinese Academy of Science, China*; ²*Wuhan Research Institute of Post & Telecommunication, China*

A1L-C SS1. Oscillator-Based Computing

Date: Monday, December 12, 2016

Time: 11:00 - 12:40

Room: Auric-1

Chair(s): Alex Yakovlev; *Newcastle University, UK*

Alex Kushnerov; *National Cheng Kung University, Taiwan*

A Reliable PPV Characterization Method for Memristor-Based Oscillators..... 41

Bo Wang, Hanyu Wang, Miao Qi

Peking University Shenzhen Graduate School, China

Neural Network Based on Parametrically-Pumped Oscillators..... 45

Gyorgy Csaba², Trond Ytterdal¹, Wolfgang Porod²

¹*Norwegian University of Science and Technology, Norway;* ²*University of Notre Dame, United States*

A 0.45V Continuous Time-Domain Filter Using Asynchronous Oscillator Structures 49

Lieuwe Leene, Timothy Constandinou

Imperial College London, United Kingdom

Stacking Voltage-Controlled Oscillators: Analysis and Application 53

Alexander Kushnerov¹, Alexandre Yakovlev²

¹*National Cheng-Kung University, Taiwan;* ²*Newcastle University, United Kingdom*

A1L-D Biomedical Monitoring Circuits and Systems

Date: Monday, December 12, 2016

Time: 11:00 - 12:40

Room: Auric-3

Chair(s): Robert Sobot; *ENSEA*

Smart E-Patch for Drugs Monitoring in Schizophrenia 57

Tugba Kilic¹, Valerie Brunner², Laurent Audoly², Sandro Carrara¹

¹*École Polytechnique Fédérale de Lausanne, Switzerland;* ²*Pierre Fabre, France*

A 15- μ A Metabolic Equivalents Monitoring System Using Adaptive Acceleration Sampling and Normally Off Computing 61

Mio Tsukahara¹, Shintaro Izumi¹, Motofumi Nakanishi¹, Hiroshi Kawaguchi¹, Masahiko Yoshimoto¹, Hiromitsu Kimura², Kyoji Marumoto², Takaaki Fuchikami², Yoshikazu Fujimori²

¹*Kobe University, Japan;* ²*Rohm Co. Ltd., Japan*

FPGA-Based Approach for Automatic Peak Detection in Cyclic Voltammetry 65

Marius Schirmer², Francesca Stradolini¹, Sandro Carrara¹, Elisabetta Chicca³

¹*École Polytechnique Fédérale de Lausanne, Switzerland;* ²*École Polytechnique Fédérale de Lausanne / Universität Bielefeld, Germany;* ³*Universität Bielefeld, Germany*

Towards Chip Scale Components for Optical Coherence Tomography 69

Frederic Nabki¹, Michael Ménard², Jonathan Brière², Mohannad Elsayed², Mohamed Rahim²

¹*École de Technologie Supérieure / Université Du Québec, Canada;* ²*Université du Québec à Montréal, Canada*

Design of an Energy Detector for Heartbeat Localization in ECG Signals 73

Zineb Benjelloun, Rémy Vauche, Wenceslas Rahajandraibe, Rachid Bouchakour

Aix Marseille Université, France

A1L-E Neural Networks and Fuzzy Systems

Date: Monday, December 12, 2016

Time: 11:00 - 12:40

Room: Apollinaire-2

Chair(s): Majid Ahmadi

Tunable Device-Mismatch Effects for Stochastic Computation in Analog/Digital Neuromorphic Computing Architectures 77

Richard George, Giacomo Indiveri

Universität Zürich / Eidgenössische Technische Hochschule Zürich, Switzerland

Brain-Inspired Pattern Classification with Memristive Neural Network Using the Hodgkin-Huxley Neuron..... 81

Amirali Amirsoleimani², Majid Ahmadi², Arash Ahmadi², Mounir Boukadoum¹

¹*Université du Québec à Montréal, Canada;* ²*University of Windsor, Canada*

Improved Winner-Take-All Circuit for Neural Network Based on Frequency-Modulated Signals..... 85

Hiroomi Hikawa

Kansai University, Japan

Model Order Reduction Using Artificial Neural Networks 89

Ahmed Adel¹, Khaled Salah²

¹*Alexandria University, Egypt;* ²*Mentor Graphics, Egypt*

RapidLink: a Network-on-Chip Architecture with Double-Data-Rate Links..... 93

Anastasios Psarras¹, Savvas Moisisdis¹, Chrysostomos Nicopoulos², Giorgos Dimitrakopoulos¹

¹*Democritus University of Thrace, Greece;* ²*University of Cyprus, Cyprus*

A2P-F Analog Circuits 1

Date: Monday, December 12, 2016
Time: 14:00 - 15:00
Room: Poster Area 1
Chair(s): Patricia Desgreys; *Telecom ParisTech, France*

Reducing Quantization Error in Time Measurement Technique for SPAD Readout Circuit.....	97
Rabih Kazma ² , Olivier Rossetto ² , Gilles Sicard ¹ <i>¹CEA-LETI, France; ²Institut national de physique nucléaire et de physique des particules, France</i>	
12-Gb/s Low-Power Voltage-Mode Driver for Multi-Standard Serial-Link Applications.....	101
Mohamed Megahed ² , Mohamed R. M. Rizk ² , Sameh A. Ibrahim ¹ , Mohamed Dessouky ¹ <i>¹Ain Shams University, Egypt; ²Alexandria University, Egypt</i>	
LDO-Assisted Vs. Linear-Assisted DC/DC Converters: a Comprehensive Study and Comparison	105
Vahideh Shirmohammadli ² , Alireza Saberkari ² , Herminio Martínez-García ¹ , Eduard Alarcón-Cot ¹ <i>¹Universitat Politècnica de Catalunya, Spain; ²University of Guilan, Iran</i>	
A 400 Mbps Radiation Hardened by Design LVDS Compliant Driver and Receiver	109
Giacomo Alberto Graceffa, Umberto Gatti, Cristiano Calligaro <i>RedCat Devices, Italy</i>	
Resonant Power Supply Noise Reduction Using a Triangular Active Charge Injection	113
Masahiro Kano, Toru Nakura, Tetsuya Iizuka, Kunihiro Asada <i>University of Tokyo, Japan</i>	
FPGA-Based Lock-in Amplifier with Sub-ppm Resolution Working Up to 6 MHz.....	117
Giacomo Gervasoni, Marco Carminati, Giorgio Ferrari <i>Politecnico di Milano, Italy</i>	

A2P-G Analog Circuits 2

Date: Monday, December 12, 2016
Time: 14:00 - 15:00
Room: Poster Area 2
Chair(s): Chadi Jabbour; *Telecom Paristech, France*

- Enhanced Voltage Buffer Compensation Technique for Two-Stage CMOS Operational Amplifiers** 121
Riccardo Zurla², Alessandro Cabrini², Marco Pasotti¹, Guido Torelli²
¹*STMicroelectronics, Italy*; ²*Università degli Studi di Pavia, Italy*
- Re-Usable 180nm CMOS Dosimeter Based on a Floating Gate Device** 125
Umberto Gatti¹, Cristiano Calligaro¹, Evgeny Pikhay², Yakov Roizin²
¹*RedCat Devices, Italy*; ²*TowerJazz, Israel*
- A 27 mV Output Ripple 92% Efficiency Buck Converter Using a Multi-Bit Delta-Sigma Modulator Controller and Segmented Output Switch in 180 nm CMOS** 129
Saeed Mehrjoo², Mohammad Taherzadeh-Sani², Frederic Nabki¹
¹*École de Technologie Supérieure / Université Du Québec, Canada*; ²*Ferdowsi University of Mashhad, Iran*
- A Hierarchical Design Automation Concept for Analog Circuits** 133
Gonenc Berkol², Engin Afacan¹, Gunhan Dündar¹, Fransisco Fernandez³
¹*Bogazici University, Turkey*; ²*Eindhoven University of Technology, Netherlands*;
³*Universidad de Sevilla, Spain*
- Noise Analysis of Current Mode Differential Integrators** 137
Hikmet Çeliker, Günhan Dündar
Bogazici University, Turkey
- Twin-Row-Style for MOS Analog Layout** 141
Bo Liu³, Shigetoshi Nakatake³, Bo Yang², Gong Chen¹
¹*Chengdu University of Information Technology, China*; ²*Design Algorithm Laboratory, Inc., Japan*; ³*University of Kitakyushu, Japan*

A2P-H RF Subsystems

Date: Monday, December 12, 2016
Time: 14:00 - 15:00
Room: Poster Area 3
Chair(s): Johan Bauwelinck; *Ghent University (Belgium)*
Luca Aluigi; *ASK (Italy)*

Study of Active Inductors with Suspendance Analysis..... 145

Sotoudeh Hamedi-Hagh
San Jose State University, United States

An Inductor-Less Transmission Line Based 60 GHz PA in 65-nm CMOS with Analog Power Control..... 149

Immanuel Raja, Gaurab Banerjee
Indian Institute of Science, India

60 GHz Stepped Impedance Filter Using Planar Goubau Line Technology 153

Emad Elrifai¹, Marjorie Grzeskowiak¹, Gaëlle Lissorgues¹, Frédérique Deshours², Gerard Carrer¹, Elodie Richalot¹, Odile Picon¹

¹*Université Paris-Est / Université Paris-Est Marne-la-Vallée / ESIEE-Paris, France;*

²*Université Pierre et Marie Curie - Paris 6, France*

Instantaneous Frequency Measurement for IR-UWB Signal in CMOS 130 nm 157

Anthony Goavec², Rémy Vauché¹, Jean Gaubert¹, Frédéric Hameau², Mykhailo Zarudniev², Eric Mercier²

¹*Aix Marseille Université, France;* ²*Université Grenoble Alpes / CEA LETI, France*

A2P-J Bioengineering, Sensors and Actuators

Date: Monday, December 12, 2016
Time: 14:00 - 15:00
Room: Poster Area 4
Chair(s): Sandro Carrara; *EPFL, Switzerland*

Design of CMOS Front-End Circuitry for the Acquisition of Biopotential Signals 161

Josef Magri, Ivan Grech, Owen Casha, Edward Gatt, Joseph Micallef
University of Malta, Malta

A Wide Voltage Range Charge Pump in 0.13 μm CMOS for Biasing of MEMS Resonators 165

Abdul Hafiz Alameh, Anoir Bouchami, Frederic Nabki
École de Technologie Supérieure / Université Du Québec, Canada

Controlling and Signal Processing Core for Wireless Implantable Telemetry System 169

Naeeme Modir³, Kyle Fricke³, Zine-Eddine Abid¹, Robert Sobot²
¹*Abu Dhabi Women's College - Higher Colleges of Technology, U.A.E.*; ²*École Nationale Supérieure de l'Électronique et de ses Applications, France*; ³*Western University, Canada*

Energy Efficiency Evaluation of the Pulse Shapes and Modulation Techniques for IR-UWB in WBANs..... 173

Leandro A. de Ávila, Rafael Kunst, Edison Pignaton, Juergen Rochol, Sergio Bampi
Universidade Federal do Rio Grande do Sul, Brazil

Dhyana: a NoC-Based Neural Network Hardware Architecture 177

Priscila Holanda, Cezar Reinbrecht, Guilherme Bontorin, Vitor Bandeira, Ricardo Reis
Universidade Federal do Rio Grande do Sul, Brazil

A Heuristic Sensitivity Analysis Technique for High-Dimensional Systems 181

Mustafa Yelten
Istanbul Technical University, Turkey

A3L-A Green and Power Electronics

Date: Monday, December 12, 2016
Time: 15:30 - 17:10
Room: Apollinaire-1
Chair(s): Adrian Ioinovici; *Holon Institute of Technology, Israël*

Z-Domain Analysis of Dickson Charge Pumps 185

Stefano Gregori, Renan Emanuelli Rotunno
University of Guelph, Canada

A Fully Integrated Switch Capacitor Step Down DC-DC Converter in 65nm Bulk CMOS Technology with Peak Efficiency Tracking 189

Carlo Veri, Mirko Pasca, Giuseppe Tau, Stefano D'Amico
Università del Salento, Italy

Auxiliary Power Supply for Solid State Transformers 193

Leandro Becker Kehler², Antônio M. Kaminski Júnior², José Renes Pinheiro², Cassiano Rech², Tiago Bandeira Marchesan², Renê Reinaldo Emmel Júnior¹
¹*Companhia Estadual de Distribuição de Energia Elétrica Distribuição, Brazil;*
²*Universidade Federal de Santa Maria, Brazil*

An Effective Methodology for Robust Design of Monolithic Voltage Regulators 197

Pasquale Napolitano², Kevin Kelliher², Basil AlMukhtar¹, Diarmuid Carey², Owen Cregg²
¹*On Semiconductor, Ireland;* ²*ON Semiconductor Ireland Ltd, Ireland*

The Analysis of Multi-Phase Current Feedforward Type-III Constant on-Time Control with Ultrafast Load Transient Response for Voltage Regulator Modules 201

Basil AlMukhtar, Paul Harriman, Kieran Burke
On Semiconductor, Ireland; On Semiconductor, United States

A3L-B Analog and Mixed Signals Circuits

Date: Monday, December 12, 2016

Time: 15:30 - 17:10

Room: Auric-1

Chair(s): Luc Hebrard; *University of Strasbourg, France*
Salvatore Pennisi; *University of Catania, Italy*

RC and RL to LC Circuit Conversion, and its Application in Poles and Zeros Identification..... 205

Reza Hashemian

Northern Illinois University, United States

A Continuous-Time Field Programmable Analog Array with 1 GHz GBW..... 209

Joachim Becker, Jens Anders, Maurits Ortmanns

Universität Ulm, Germany

A Multi-Modulus Divider with High Sensitivity and Extended Division Range in 0.18 μm BiCMOS 213

Martin Kreißig, Mohammed El-Shennawy, Frank Ellinger

Technische Universität Dresden, Germany

A 10-Gb/s Low-Power Low-Voltage CTLE Using Gate and Bulk Driven Transistors..... 217

Amin Aghighi², Abdul Hafiz Alameh³, Mohammad Taherzadeh-Sani², Frederic Nabki¹

¹*École de Technologie Supérieure / Université Du Québec, Canada;* ²*Ferdowsi*

University of Mashhad, Iran; ³*Université du Québec à Montréal, Canada*

Ultra-Low Distortion Linearized Pseudo-RC Low-Pass Filter 221

Tamer Elfaramawy², Masoud Rezaei², Martin Morissette¹, François Lellouche³, Benoit Gosselin²

¹*OxyNov, Canada;* ²*Université Laval, Canada;* ³*Université Laval / OxyNov, Canada*

A3L-C SS7. Advanced Concepts for Future RF and mmW Transceivers

Date: Monday, December 12, 2016
Time: 15:30 - 17:10
Room: Auric-2
Chair(s): Antoine Frappe; *ISEN Lille, France*
François Rivet; *University of Bordeaux, France*

Ultra Low-Power MEMS Based Radios for the IoT..... 225

Raghavasimhan Thirunarayanan², Aravind Heragu³, David Ruffieux¹, Christian Enz²
¹CSEM SA, Switzerland; ²École Polytechnique Fédérale de Lausanne, Switzerland;
³Semtech, Switzerland

A Jitter-Resilient Sampling Technique for High-Resolution ADCs in Wideband RF Receivers..... 229

Shiva Jamali-Zavareh, Ramesh Harjani
University of Minnesota, United States

All-Digital Transceivers - Recent Advances and Trends..... 233

Andre Prata, Rui Fiel Cordeiro, Daniel C. Dinis, Arnaldo S. R. Oliveira, José Vieira, Nuno Carvalho
Universidade de Aveiro / Instituto de Telecomunicacoes, Portugal

Delta-Sigma Based Digital Transmitters with Low-Complexity Embedded-FIR Digital to RF Mixing..... 237

Răzvan Cristian Marin, Antoine Frappé, Andreas Kaiser
IEMN-ISEN, France

Experimental Demonstration of a Riemann Pump RF-DAC in 65 nm CMOS 241

Yoan Veyrac, François Rivet, Yann Deval
IMS Laboratory, France

A3L-D Signal Processing

Date: Monday, December 12, 2016
Time: 15:30 - 17:10
Room: Auric-3
Chair(s): Mounir Boukadoum; *UQAM, Canada*

Digital Signal Splitting Among Multiple DACs for Analog Bandwidth Interleaving (ABI) 245

Christian Schmidt², Vicky Tanzil¹, Christoph Kottke², Ronald Freund¹, Volker Jungnickel¹
¹*Fraunhofer Heinrich Hertz Institute, Germany*; ²*Fraunhofer Heinrich Hertz Institute / Technische Universität Berlin, Germany*

Efficient and Fast SOP-Based Inpainting for Neurological Signals in Resource Limited Systems..... 249

Sebastian Schmale, Pascal Seidel, Heiner Lange, Benjamin Knoop, Dagmar Peters-Drolshagen, Steffen Paul
Universität Bremen, Germany

Performance Analysis of a Reduced Complexity SCMA Decoder Exploiting a Low-Complexity Maximum-Likelihood Approximation..... 253

Roya Alizadeh, Yvon Savaria
Polytechnique Montréal, Canada

High-Performance Bivariate Numeric Function Approximation for Hardware-Efficient QR-Decomposition..... 257

Jochen Rust, Benjamin Knoop, Steffen Paul
Universität Bremen, Germany

A Power-Efficient Imprecise Radix-4 Multiplier Applied to High Resolution Audio Processing..... 261

Guilherme Paim², Leonardo Soares³, Julio Oliveira¹, Eduardo A. C. da Costa¹, Sergio Bampi³

¹*Universidade Católica de Pelotas, Brazil*; ²*Universidade Federal de Pelotas / Universidade Federal do Rio Grande do Sul, Brazil*; ³*Universidade Federal do Rio Grande do Sul, Brazil*

A3L-E Digital Circuit Reliability

Date: Monday, December 12, 2016

Time: 15:30 - 17:10

Room: Apollinaire-2

Chair(s): Mathieu Thevenin; *CEA France*

Electromagnetic Security Tests for SoC 265

Fabien Majéric¹, Eric Bourbao¹, Lilian Bossuet²

¹*Gemalto, France*; ²*Laboratoire Hubert Curie / University of Lyon, Saint-Etienne / Université Jean Monnet, France*

ECC Module Optimization for Storage Transient Error-Tolerant ASICs 269

Keisuke Inoue

Kanazawa Technical College, Japan

Investigating the Efficiency and Accuracy of a Data Type Reduction Technique for Soft Error Analysis 273

Ghaith Kazma¹, Ghaith Bany Hamad², Otmane Ait Mohamed¹, Yvon Savaria²

¹*Concordia University, Canada*; ²*Polytechnique Montréal, Canada*

Impact Evaluation of Logic Blocks Configuration on FPGA's Soft Error Rate Estimation 277

Fábio Batagin Armelin¹, Lírida A. B. Naviner³, Roberto d'Amore², Irany A. Azevedo²

¹*Instituto Nacional de Pesquisas Espaciais, Brazil*; ²*Instituto Tecnológico de Aeronáutica, Brazil*; ³*Télécom ParisTech, France*

Extending the Viability of Power Signature – Based IP Watermarking in the SoC Era 281

George Blanas, Haridimos Vergos

University of Patras, Greece

B1L-A SS6. Digitally Enhanced Mixed-Signal systems

Date: Tuesday, December 13, 2016
Time: 10:30 - 12:10
Room: Auric-1
Chair(s): Dominique Dallet; *IMS Bordeaux, France*
Chadi Jabbour; *Telecom Paristech, France*

A Survey of Delay and Gain Correction Methods for the Indirect Learning of Digital Predistorters..... 285

Harald Enzinger², Karl Freiberger², Gernot Kubin², Christian Vogel¹
¹*FH Joanneum / University of Applied Sciences, Austria*; ²*Technische Universität Graz, Austria*

Comparison of Hill-Climbing and Genetic Algorithms for Digital Predistortion Models Sizing 289

Siqi Wang, Mazen Abi Hussein, Geneviève Baudoin, Olivier Venard, Tomas Gotthans
ESIEE Paris, France

A New Approach for Compensating Memory Nonlinear Analog-to-Digital Converters Using Look-Up Tables 293

Bryce Minger², Guillaume Ferré¹, Dominique Dallet¹, Loïc Fuché²
¹*IMS Laboratory, France*; ²*Thales Communications & Security, France*

Estimation Techniques for Timing Mismatch in Time-Interleaved Analog-to-Digital Converters: Limitations and Solutions 297

Han Le Duc, Chadi Jabbour, Patricia Desgreys, Van Tam Nguyen
Télécom ParisTech , France

A CMOS 65nm 120 dB Stacked A/D Converters Receiver for Long Wavelength Radio Astronomy Observations..... 301

Reda Mohellebi², Chadi Jabbour², Baptiste Cecconi¹, Hervé Petit², Moustapha Dekkali¹, Milan Maksimovic¹, Patrick Loumeau²
¹*Observatoire de Paris, France*; ²*Télécom ParisTech , France*

B1L-B Sensing Electronics

Date: Tuesday, December 13, 2016
Time: 10:30 - 12:10
Room: Apollinaire-1
Chair(s): Luc Hebrard; *University of Strasbourg, France*
Herve Barthelemy; *Université de Toulon*

Enhanced Analytical Model and Output Dynamic Response of SiPM-Based Electronic Read-Outs 305

Daive Marano¹, Alfio Dario Grasso²
¹*Istituto Nazionale di Astrofisica / Osservatorio Astrofisico di Catania, Italy*; ²*Università degli Studi di Catania, Italy*

Integrated High-Voltage CMOS Mixed-Signal Instrumentation System for OFET-Based Gas Sensor..... 309

Vincent Frick, Patrick Lévêque, Ugur Soysal, Thomas Heiser
Université de Strasbourg / CNRS, France

Compressed Sensing for Astrophysical Signals 313

Yosra Gargouri², Hervé Petit², Patrick Loumeau², Baptiste Cecconi¹, Patricia Desgreys²
¹*Observatoire de Paris, France*; ²*Télécom ParisTech, France*

ECG Signal Acquisition for the Pan-Tompkins Algorithm Using Current-Mirror Filters 317

Costas Vastarouchas, Stavroula Kapoulea, Costas Psychalinos
University of Patras, Greece

B1L-C RF Circuits & Techniques

Date: Tuesday, December 13, 2016

Time: 10:30 - 12:10

Room: Auric-2

Chair(s): Federico Alimenti; *University of Perugia (Italy)*
Nathalie Deltimple; *IMS Laboratory, France*

A New Compact Wireless Power Transfer System Using C-Shaped Printed Resonators 321

Ramy Sharaf¹, Sherif Hekal¹, Anwer Abd El-Hameed¹, Adel B. Abdel-Rahman², Ramesh K. Pokharel²

¹*Egypt-Japan University of Science and Technology, Egypt;* ²*South Valley University, Egypt*

Design of Optimized High Q Inductors on SOI Substrates for RF ICs..... 324

Anne-Sophie Royet², Jean-Philippe Michel², Bruno Reig², Jean-Louis Pornin², Manohiaina Ranaivoniarivo¹, Bruno Robain¹, Pierre De Person¹, Gregory Uren¹

¹*Altis Semiconductor, France;* ²*CEA-LETI, France*

A Low Power Control System for Real-Time Tuning of a Hybrid Transformer-Based Receiver 328

Gerardo Castellano¹, Davide De Caro¹, Antonio Strollo¹, Danilo Manstretta²

¹*Università degli Studi di Napoli Federico II, Italy;* ²*Università degli Studi di Pavia, Italy*

K-Band SiGe Dual-Input LNA and Detector for SoC Radiometers for Remote Sensing of Atmosphere 332

Luca Aluigi, Domenico Pepe, Domenico Zito

Tyndall National Institute, Ireland

B1L-D Image and Video Processing Architectures

Date: Tuesday, December 13, 2016
Time: 10:30 - 12:10
Room: Auric-3
Chair(s): Sergio Bampi; *UFRGS (BR)*
Alexander Fish; *Bar-Ilan University (IL)*

A Hardware Configurable Self-Organizing Map for Real-Time Color Quantization 336

Mehdi Abadi¹, Slavisa Jovanovic¹, Khaled Ben Khalifa², Serge Weber¹, Mohammed Hédi Bedoui²

¹*Université de Lorraine, France;* ²*Université de Monastir, Tunisia*

Power-Efficient Sum of Absolute Differences Architecture Using Adder Compressors 340

Bianca Silveira¹, Guilherme Paim², Cláudio M. Diniz¹, Eduardo A. C. da Costa¹

¹*Universidade Católica de Pelotas, Brazil;* ²*Universidade Federal de Pelotas / Universidade Federal do Rio Grande do Sul, Brazil*

Memory Energy Consumption Analyzer for Video Encoder Hardware Architectures 344

Livia Amaral¹, Guilherme Povala¹, Marcelo Porto¹, Dieison S. Silveira², Sergio Bampi²

¹*Universidade Federal de Pelotas, Brazil;* ²*Universidade Federal do Rio Grande do Sul, Brazil*

3D-HEVC Depth Maps Intra Prediction Complexity Analysis 348

Gustavo Sanchez¹, Rodrigo Cataldo¹, Ramon Fernandes¹, Luciano Agostini², César Marcon¹

¹*Pontifícia Universidade Católica do Rio Grande do Sul, Brazil;* ²*Universidade Federal de Pelotas, Brazil*

Real-Time Simplified Edge Detector Architecture for 3D-HEVC Depth Maps Coding 352

Gustavo Sanchez¹, Mário Saldanha², Marcelo Porto², Bruno Zatt², Luciano Agostini², César Marcon¹

¹*Pontifícia Universidade Católica do Rio Grande do Sul, Brazil;* ²*Universidade Federal de Pelotas, Brazil*

B1L-E SS5. Data Centers: High Performance Systems, Elements & Algorithms

Date: Tuesday, December 13, 2016

Time: 10:30 - 12:10

Room: Apollinaire-2

Chair(s): Dionysis Reisis; *U of Athens, Greece*

Christos Spatharakis; *National Technical Univ. of Athens, Greece*

A 56 Gbaud Reconfigurable FPGA Feed-Forward Equalizer for Optical Datacenter Networks with Flexible Baudrate- and Modulation-Format 356

Christos Spatharakis, Giannis Kanakis, Nikolaos Iliadis, Paraskevas Bakopoulos, Hercules Avramopoulos, Konstantinos Maragos, George Lentaris, Dimitrios Soudris
National Technical University of Athens, Greece

Optical PAM-4 Generation Through Polarization Multiplexing in Single-Polarization Single-Mode VCSELS 360

Nikos Iliadis¹, Giannis Kanakis¹, Nikolaos Argyris¹, Christos Spatharakis¹, Paraskevas Bakopoulos¹, Hercules Avramopoulos¹, Silvia Spiga², Marcus-Christian Amann²
¹*National Technical University of Athens, Greece*; ²*Technische Universität München, Germany*

Switching Functions of a Data Center Top-of-Rack (ToR) 364

Ioannis Patronas, Angelos Kyriakos, Dionysios Reisis
National and Kapodistrian University of Athens, Greece

Collisions Free Scheduling in the NEPHELE Hybrid Electrical/Optical Datacenter Interconnect..... 368

Kostas Christodouloupoulos¹, Kostas Kontodimas², Apostolis Siokis², Kostas Yiannopoulos³, Emmanouel Varvarigos¹
¹*National Technical University of Athens, Greece*; ²*University of Patras, Greece*; ³*University of Peloponnese, Greece*

SDN-Enabled Application-Aware Networking for Data Center Networks 372

Muzzamil Aziz¹, Amirreza Fazely Hamedani¹, Giada Landi³, Domenico Gallico², Kostas Christodouloupoulos⁴, Philipp Wieder¹
¹*Gesellschaft für wissenschaftliche Datenverarbeitung mbH, Germany*; ²*Interoute, Italy*; ³*Nextworks S.r.l., Italy*; ⁴*University of Patras, Greece*

B2P-F Embedded Systems

Date: Tuesday, December 13, 2016
Time: 14:00 - 15:00
Room: Poster Area 1
Chair(s): Sandro Carrara; *EPFL, Switzerland*

Logic Filter Cache for Wide-VDD-Range Processors 376

Alen Bardizbanyan¹, Oskar Andersson², Joachim Rodrigues², Per Larsson-Edefors¹
¹*Chalmers University of Technology, Sweden;* ²*Lund University, Sweden*

Runtime Energy Management for Many-Core Systems 380

André L. M. Martins, Anderson C. Sant'Ana, Fernando G. Moraes
Pontifícia Universidade Católica do Rio Grande do Sul, Brazil

Remote Rehabilitation Monitoring with an IoT-Enabled Embedded System for Precise Progress Tracking 384

Maurizio Rossi², Andrea Rizzi², Leandro Lorenzelli¹, Davide Brunelli²
¹*Fondazione Bruno Kessler, Italy;* ²*Università degli Studi di Trento, Italy*

A Dynamic Cache Reconfiguration Platform for Soft Real-Time Systems 388

Oswaldo Navarro, Tim Leiding, Michael Hübner
Ruhr-Universität Bochum, Germany

Customized High Performance Low Power Processor for Binaural Speaker Localization 392

Nicolai Behmann², Christopher Seifert², Guillermo Paya-Vaya², Holger Blume², Pekka Jääskeläinen³, Joonas Multanen³, Heiki Kultala³, Jarmo Takala³, Joachim Thiemann¹, S. van de Par¹
¹*Carl von Ossietzky Universität Oldenburg, Germany;* ²*Leibniz Universität Hannover, Germany;* ³*Tampere University of Technology, Finland*

Scalability Evaluation in Many-Core Systems Due to the Memory Organization 396

Guilherme Madalozzo¹, Liana Duenha², Rodolfo Azevedo², Fernando G. Moraes¹
¹*Pontifícia Universidade Católica do Rio Grande do Sul, Brazil;* ²*Universidade Estadual de Campinas, Brazil*

Agora: Agent and Market-Based Resource Management for Many-Core Systems 400

Themistoklis Melissaris³, Iraklis Anagnostopoulos⁴, Dimitrios Soudris², Dionysios Reisis¹
¹*National and Kapodistrian University of Athens, Greece;* ²*National Technical University of Athens, Greece;* ³*Princeton University, United States;* ⁴*Southern Illinois University, United States*

B2P-G Emerging Secure Technologies

Date: Tuesday, December 13, 2016

Time: 14:00 - 15:00

Room: Poster Area 2

Chair(s): Amara Amara; *ISEP, France*

Strain Reliability and Substrate Specific Features of Passive UHF RFID Textile Tag Antennas..... 404

Johanna Virkki, Toni Björninen, Mitra Akbari, Leena Ukkonen
Tampere University of Technology, Finland

Evaluation of Emerging TSV-Enabled Main Memories on the Parsec Benchmark..... 408

Rodrigo Cataldo¹, Guilherme Korol¹, Ramon Fernandes¹, Gustavo Sanchez¹, Debora Matos², César Marcon¹
¹*Pontifícia Universidade Católica do Rio Grande do Sul, Brazil;* ²*Universidade Estadual do Rio Grande do Sul, Brazil*

Secure Scan Chain Using Test Port for Tester Authentication..... 412

Yahia Ouahab, Donatus Silva Richard, Rashid Rashidzadeh
University of Windsor, Canada

B2P-H PhD Students & Young Professionals Poster & Demo Session

Date: Tuesday, December 13, 2016
Time: 14:00 - 15:00
Room: Poster Area 3
Chair(s): Elena Blokhina; *University College Dublin*
Dimitri Galayko; *UPMC-Sorbonne, LIP6, France*

Comparative Study of CMOS Lock-in Amplifiers for Wideband Bioelectrical Impedance Measurements..... 416

David Palomeque-Mangut, José L. Ausín, Francisco Duque-Carrillo
Universidad de Extremadura, Spain

A 2-Gb/s 60 GHz Transmission-Gate Based 130nm CMOS on-Off Keying Modulator..... 420

Nuraishah Sarimin, Rahma Abdaoui, Costin Anghel
Institut Supérieur d'électronique de Paris, France

Pulse Oximetry Using a Buried Quad Junction Photodetector..... 423

Alejandro Von Chong, Mehdi Terosiet, Aymeric Histace, Olivier Romain
École Nationale Supérieure de l'Électronique et de ses Applications, France

A Smart Energy Extraction Interface for Electrostatic Vibrational Energy Harvester 425

Mohammed Bedier¹, Dimitri Galayko²
¹*Laboratoire d'informatique de Paris 6, France;* ²*Universite Pierre et Marie-Curie / Université Paris-Sorbonne, France*

A Compressive Domain Saliency -Based Adaptive Measurement Method for Image Recovery 427

Honggui Li³, Maria Trocan¹, Ricardo Carmona-G. }, Marco Trevisi²
¹*Institut Supérieur d'électronique de Paris, France;* ²*Instituto de Microelectrónica de Sevilla IMSE-CNM, Italy;* ³*Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain;*
³*Yangzhou University, China*

Image Quality Impact for Eye Tracking Systems Accuracy 429

Pavel Morozkin¹, Marc Swynghedauw², Maria Trocan¹
¹*Institut Supérieur d'électronique de Paris, France;* ²*SuriCog, France*

Semi-Automated Analog Placement 432

Eric Lao, Marie-Minerve Louërat, Jean-Paul Chaput
Laboratoire d'informatique de Paris 6, France

Discrete-Time Modelling and Experimental Validation of an All-Digital PLL for Clock-Generating Networks 434

Eugene Koskin
University College Dublin, Ireland

Electromechanical Coupling in Electrostatic Kinetic Energy Harvesters 436

Eoghan O'Riordan², Elena Blokhina², Dimitri Galayko¹
¹*Universite Pierre et Marie-Curie / Université Paris-Sorbonne, Ireland;* ²*University College Dublin, Ireland*

Local Congestion and Blockage Aware Routability Analysis Using Adaptive Flexible Modeling 438

Zhonghua Zhou², Peter Hallschmid¹, André Ivanov²
¹*Blackcomb Design Automation Inc., Canada;* ²*University of British Columbia, Canada*

Impact of Variability Effects on FinFET Transistors and Combinational Cells.....	440
Alexandra Lackmann Zimpeck, Ricardo Reis <i>Universidade Federal do Rio Grande do Sul, Brazil</i>	
Designing CT $\Sigma\Delta$ Modulators with www.sigma-delta.de	442
Johannes Wagner, Maurits Ortmanns <i>Universität Ulm, Germany</i>	
Delta-Sigma Modulator Based Spectrum Sensing Transceiver	443
Tamer Badran, Hassan Aboushady <i>Laboratoire d'informatique de Paris 6, France</i>	

B3L-A Frequency Synthesis & Synchronization

Date: Tuesday, December 13, 2016
Time: 15:30 - 17:10
Room: Auric-3
Chair(s): Domenico Pepe; *Univ. of Modena & Reggio E. (Italy)*
Domenico Zito; *Aarhus University*

Fundamental Limitations of Phase Noise on FMCW Radar Precision..... 444

Mohammed El-Shennawy, Belal Al-Qudsi, Niko Joram, Frank Ellinger
Technische Universität Dresden, Germany

**On the Statistical Properties of Phase Noise in Fractional-N Frequency
Synthesizers Using Successive Requantizers..... 448**

Yann Donnelly, Michael Peter Kennedy
University College Cork / Tyndall National Institute, Ireland

Yet Another Spur Mechanism in a Charge-Pump Based Fractional-N PLL..... 452

Aidan Marnane¹, Valerio Marotta¹, Michael Peter Kennedy²
¹*Tyndall National Institute, Ireland*; ²*University College Cork / Tyndall National Institute, Ireland*

A 1-mW 12-GHz LC VCO in 65-nm CMOS Technology 456

Aya Amer, Sameh A. Ibrahim, Hani Ragai
Ain Shams University, Egypt

**Frequency Synchronization for Wireless Networks Using Field Programmable
Gate Arrays..... 460**

Markus Appel, Felix Wermke, Frank Winkler, Beate Meffert
Humboldt-Universität zu Berlin, Germany

B3L-B Sigma-Delta Converters

Date: Tuesday, December 13, 2016
Time: 15:30 - 17:10
Room: Auric-1
Chair(s): Antoine Frappe; *ISEN Lille, France*
Franco Maloberti; *University of Pavia, Italy*

A Continuous-Time Direct RF-to-Digital $\Delta\Sigma$ Receiver 464

Minh Tien Nguyen, Chadi Jabbour, Van Tam Nguyen
Télécom ParisTech, France

Finite GBW in Single OpAmp CT $\Sigma\Delta$ Modulators 468

Johannes Wagner, Stefan Reich, Rudolf Ritter, Jens Anders, Maurits Ortmanns
Universität Ulm, Germany

**Maximizing the Fundamental Period of a Dithered Digital Delta-Sigma Modulator
with Constant Input 472**

Hongjia Mo³, Xiao Tan¹, Michael Peter Kennedy²
¹*University College Cork, Ireland*; ²*University College Cork / Tyndall National Institute,
Ireland*; ³*University College Cork and Tyndall National Institute, Iceland*

**Phase Noise Vs. Jitter Analysis in Continuous-Time LP and BP $\Sigma\Delta$ Modulators
with Interferers 476**

Jiazuo Chi, Rudolf Ritter, Johannes Wagner, Jens Anders, Maurits Ortmanns
Universität Ulm, Germany

**Designing CT $\Sigma\Delta$ Modulators with Shaped Feedback Waveforms Using
www.sigma-delta.de 480**

Johannes Wagner, Jiazuo Chi, Maurits Ortmanns
Universität Ulm, Germany

B3L-C SS3. Reconfigurable Circuits & Systems for Narrowband & Broadband Multi-standards Applications

Date: Tuesday, December 13, 2016
Time: 15:30 - 17:10
Room: Auric-2
Chair(s): Nathalie Deltimple; *IMS Laboratory, France*
Rahma ABDAOUI; *Minarc-ISEP, France*

Two-Branch Channelized N-Path Filter for Reconfigurable Receiver..... 484

Mohammed Adnan Addou², Ragheb Hijazi², Roberto Gómez-García¹, Bruno Barelaud²,
Bernard Jarry², Julien Lintignat²
¹*Universidad de Alcalá, Spain;* ²*XLIM Laboratory, France*

Broadband SOI PA with Tunable Matching Network for Improved LTE Performances Under High VSWR..... 488

Ayssar Serhan, Pierre Ferris, Alexandre Giry
CEA-LETI, France

Multi-Band Dual-Mode Antenna Tunable Matching Network for Broadband Applications..... 492

Francis Chan Wai Po², Rahma Abdaoui², Alexandre Giry¹
¹*CEA-LETI, France;* ²*Institut Supérieur d'électronique de Paris, France*

Implementation and Simulation of the Impact of Mixer Phase Mismatch in Cartesian Feedback Linearization Systems 496

Camilo Coelho, Yann Delomier, Dominique Dallet, Nathalie Deltimple, Eric Kerhervé
IMS Laboratory, France

B3L-D Energy Harvesting

Date: Tuesday, December 13, 2016
Time: 15:30 - 17:10
Room: Apollinaire-1
Chair(s): Ana Rusu; *KTH (Sweden)*
Stefano Gregori; *University of Guelph (Canada)*

Electrostatic Energy Harvester Based on Multiple Variable Capacitors 500

Yin Li, Manjusri Misra, Stefano Gregori
University of Guelph, Canada

An Adaptive FET Sizing Technique for High Efficiency Thermoelectric Harvesters 504

Janko Katic, Saul Rodriguez, Ana Rusu
KTH Royal Institute of Technology, Sweden

Efficient Passive Energy Harvesters at 950 MHz and 2.45 GHz for 100 μ W Applications in 65 nm CMOS 508

Pierre-Antoine Haddad, Jean-Pierre Raskin, Denis Flandre
Université catholique de Louvain, Belgium

A 200 μ m by 100 μ m Smart Dust System with an Average Current Consumption of 1.3 nA 512

Dominic Funke, Pierre Mayr, Lukas Straczek, John McCaskill, Jürgen Oehm, Nils Pohl
Ruhr-Universität Bochum, Germany

B3L-E Low Power Digital Circuits

Date: Tuesday, December 13, 2016

Time: 15:30 - 17:10

Room: Apollinaire-2

Chair(s): Mathieu Thevenin; *CEA France*

Energy Efficient Bootstrapped CMOS Inverter for Ultra-Low Power Applications..... 516

Mohammed Al-Daloo¹, Alex Yakovlev¹, Basel Halak²

¹Newcastle University, United Kingdom; ²University of Southampton, United Kingdom

Ultra-Low Voltage Standard Cell Libraries: Design Strategies and a Case Study..... 520

Somayeh Timarchi², Massimo Alioto¹

¹National University of Singapore, Singapore; ²Shahid Beheshti University, Iran

Test of Low Power Circuits: Issues and Industrial Practices..... 524

Alberto Bosio², Patrick Girard¹, Arnaud Virazel²

¹LIRMM / CNRS, France; ²LIRMM / University of Montpellier, France

PVT Variability Analysis of FinFET and CMOS XOR Circuits at 16nm 528

Fabio G. R. G. da Silva, Paulo Francisco Butzen, Cristina Meinhardt

Universidade Federal do Rio Grande, Brazil

An Low-Energy 8T Dual-Port SRAM for Image Processor with Selective Sourceline Drive Scheme in 28-nm FD-SOI Process Technology 532

Haruki Mori, Tomoki Nakagawa, Yuki Kitahara, Yuta Kawamoto, Kenta Takagi, Shusuke Yoshimoto, Shintaro Izumi, Hiroshi Kawaguchi, Masahiko Yoshimoto

Kobe University, Japan

C1L-A SS4. Issues and Trends Towards Resilient and Energy Efficient Embedded Electronic Systems

Date: Wednesday, December 14, 2016
Time: 10:30 - 12:10
Room: Auric-1
Chair(s): Maurizio Valle; *University of Genova , Italy*
Ali Ibrahim; *University of Genova , Italy*

Resiliency in Nanometer CMOS Systems: an Overview 536

Ali Ibrahim, Maurizio Valle
Università degli studi di Genova, Italy

Designing Reliable, Yet Energy-Efficient Guardbands 540

Jörg Henkel, Hussam Amrouch
Karlsruher Institut für Technologie, Germany

Ultra Low Power Supply Monitor System for Embedded Applications 544

Jose Tejada, Alberto Sanchez
Analog Devices, Inc., Spain

A Closed-Form Energy Model for VLSI Circuits Under Wide Voltage Scaling 548

Saurabh Jain, Massimo Alioto
National University of Singapore, Singapore

Always-On Motion Detection with Application-Level Error Control on a Near-Threshold Approximate Computing Platform 552

Giuseppe Tagliavini, Andrea Marongiu, Davide Rossi, Luca Benini
Università di Bologna, Italy

C1L-B Noise and Variability Tolerant Design

Date: Wednesday, December 14, 2016
Time: 10:30 - 12:10
Room: Apollinaire-1
Chair(s): Maurits Ortmanns; *University of Ulm, Germany*
Yann Deval; *IMS Bordeaux, France*

Analysis of Non-Idealities in Parallel-Summation Logarithmic Amplifiers 556

Jose L. Ausin¹, Javier Ramos¹, Francisco Duque-Carillo¹, Guido Torelli²
¹*Universidad de Extremadura, Spain;* ²*Università degli Studi di Pavia, Italy*

Sub-Electron CIS Noise Analysis in 65 nm Process 560

Raffaele Capoccia, Assim Boukhayma, Christian Enz
École Polytechnique Fédérale de Lausanne, Switzerland

On the Influence of Strong Magnetic Field on MOS Transistors 564

Luc Hébrard¹, Duc Vinh Nguyen¹, Dorian Vogel¹, Jean-Baptiste Schell¹, Chrystelle Po¹,
Norbert Dumas¹, Wilfried Uhring¹, Joris Pascal²
¹*Université de Strasbourg / CNRS, France;* ²*University of Applied Sciences and Arts
Northwestern Switzerland FHNW, Switzerland*

**Enhanced Arbiter PUFs Using Custom Sized Structures for Reduced Noise
Sensitivity 568**

Andreas Herkle, Markus Schuster, Joachim Becker, Maurits Ortmanns
Universität Ulm, Germany

UTBB-FDSOI Complementary Logic for High Quality Analog Signal Processing 572

Zhaopeng Wei², Yves Leduc², Gilles Jacquemod², Emeric de Foucauld¹
¹*CEA-LETI, France;* ²*Université Nice Sophia Antipolis, France*

C1L-C High-speed Circuits & Techniques

Date: Wednesday, December 14, 2016
Time: 10:30 - 12:10
Room: Auric-2
Chair(s): Johan Bauwelinck; *Ghent University (Belgium)*
Domenico Zito; *Aarhus University*

A 25Gb/s Low-Noise Optical Receiver in 0.13 μ m SiGe BiCMOS..... 576

Dan Li, Zimou Zhang, Yang Xie, Ming Liu, Qian Yang, Li Geng
Xi'an Jiaotong University, China

Impact of Nonlinear Power Amplifier on the Transmission of Scalable Multimedia Contents 580

Sohtsinda Hermann, Perrine Clency, Bachir Smail, Duvanaud Claude, Koussa Badreddin
Université de Poitiers / XLIM Research Institute, France

RJ/DJ Jitter Decomposition Technique for High Speed Links..... 584

Klodjan Bidaj², Jean-Baptiste Begueret², Jerome Deroo¹
¹*STMicroelectronics, France*; ²*University of Bordeaux, France*

Uplink Wireless Transmission Overview in Bi-Directional VLC Systems 588

Pablo Pérez-Nicoli², Fernando Silveira², Xun Zhang¹, Amara Amara¹
¹*Institut Supérieur d'électronique de Paris, France*; ²*Universidad de la República, Uruguay*

Reliability Analysis of Memory Centric LDPC Decoders Under Probabilistic Storage Failures 592

Alexandru Amaricai², Sergiu Nimara², Oana Boncalo², Emanuel Popovici¹
¹*University College Cork, Ireland*; ²*University Politehnica Timisoara, Romania*

C1L-D Nonlinear Circuits and Systems

Date: Wednesday, December 14, 2016
Time: 10:30 - 12:10
Room: Apollinaire-2
Chair(s): Ivan Grech; *University of Malta*

Nonlinear Synchronization of Fractional-Order Lu and Qi Chaotic Systems 596

Vijay Yadava¹, Subir Das¹, Donato Cafagna²
¹*Indian Institute of Technology, India;* ²*Università del Salento, Italy*

Signal Boosting to Extend the Bandwidth of Oversampled Converters 600

Laura Conesa-Peraleja², Susana Paton², Dietmar Straeusnigg¹, Andreas Wiesbauer¹
¹*Infineon Technologies Austria AG, Austria;* ²*Universidad Carlos III de Madrid, Spain*

Memristors and Other Higher-Order Elements in Generalized Through-Across Domain 604

Dalibor Bišek², Zdenek Bišek¹, Viera Biolková¹
¹*Brno University of Technology, Czech Rep.;* ²*Brno University of Technology / University of Defence, Czech Rep.*

Predicting the Oscillation Condition of Memristor-Based Oscillators Using Hopf Bifurcation Theory 608

Miao Qi, Hanyu Wang, Bo Wang
Peking University Shenzhen Graduate School, China

Comments on "Folding of Phase Noise Spectra in Charge-Pump Phase-Locked Loops Induced by Frequency Division" 612

Dawei Mai¹, Hongjia Mo³, Michael Peter Kennedy²
¹*Tyndall National Institute, Ireland;* ²*University College Cork / Tyndall National Institute, Ireland;* ³*University College Cork and Tyndall National Institute, Ireland*

C1L-E CAD and Optimization

Date: Wednesday, December 14, 2016
Time: 10:30 - 12:10
Room: Auric-3
Chair(s): Ricardo Reis; *UFRGS, Brazil*

A Data Extraction and Debugging Framework for Large-Scale MPSoCs 616

Marcelo Ruaro, Henrique Chamorra, Felipe Rubin, Alexandre Amory, Fernando G. Moraes
Pontifícia Universidade Católica do Rio Grande do Sul, Brazil

Quadratic Timing Objectives for Incremental Timing-Driven Placement Optimization 620

Mateus Fogaça, Guilherme Flach, Jucemar Monteiro, Marcelo Johann, Ricardo Reis
Universidade Federal do Rio Grande do Sul, Brazil

Exploiting Parallelism to Speed Up Circuit Legalization 624

Renan Netto, Chrystian Guth, Vinicius Livramento, Marcio Castro, Laercio Lima Pilla, José Luís Güntzel
Universidade Federal de Santa Catarina, Brazil

Software-Based Mechanism for Network-on-Chip Performance Increase 628

Marcelo Linck, Gabriel Paz, Augusto Santos, César Marcon
Pontifícia Universidade Católica do Rio Grande do Sul, Brazil

C2P-F VLSI

Date: Wednesday, December 14, 2016
Time: 14:00 - 15:00
Room: Poster Area 1
Chair(s): Mathieu Thevenin; *CEA France*

Efficient Routing Table Minimization for Fault-Tolerant Irregular Network-on-Chip 632

Rafael Gonçalves Mota², Jarbas Silveira², Jardel Silveira², Lucas Brahm¹, Avelino Zorzo¹, Filipo Mór¹, César Marcon¹

¹*Pontifícia Universidade Católica do Rio Grande do Sul, Brazil*; ²*Universidade Federal do Ceará, Brazil*

Programmable Incrementing/Decrementing Binary Accumulator for High-Speed Calibration Loops 636

Arefeh Soltani², Roozbeh Abdollahi², Sarang Kazemini¹

¹*Urmia University of Technology, Iran*; ²*Urumi Graduate Institute, Iran*

Mapping of Real-Time Applications on a Packet Switching NoC-Based MPSoC 640

Guilherme Madalozzo¹, Indrusiak Indrusiak², Fernando G. Moraes¹

¹*Pontifícia Universidade Católica do Rio Grande do Sul, Brazil*; ²*University of York, United Kingdom*

Single-Ended Impedance-Modulation Equalization for Low-Power Differential Voltage-Mode Drivers 644

Ali Badiey², Reza Papi², Navid Rahmanikia², Mohammad Taherzadeh-Sani², Frederic Nabki¹

¹*École de Technologie Supérieure / Université Du Québec, Canada*; ²*Ferdowsi University of Mashhad, Iran*

Cell-Aware MBFF Utilization for Clock Power Reduction 648

Jin-Tai Yan¹, Meng-Tian Chen¹, Chia-Heng Yen²

¹*Chung-Hua university, Taiwan*; ²*National Taiwan Ocean University, Taiwan*

ASCEnd-FreePDK45: an Open Source Standard Cell Library for Asynchronous Design 652

Carlos H. M. Oliveira, Matheus T. Moreira, Ricardo A. Guazzelli, Ney L. V. Calazans
Pontifícia Universidade Católica do Rio Grande do Sul, Brazil

C2P-G Green and Harvesting Energy

Date: Wednesday, December 14, 2016
Time: 14:00 - 15:00
Room: Poster Area 2
Chair(s): Alessandro Cabrini; *University of Pavia (Italy)*
Edoardo Bonizzoni; *University of Pavia (Italy)*

An Integrated Current Sensing Circuit with Comparator Function for a Buck DC-DC Converter in HV-CMOS 656

Natasa Mitrović, Reinhard Enne, Horst Zimmermann
Technische Universität Wien, Austria

Advanced Electronic Circuit Breaker Techniques for the Use in Electric Vehicle Charging Stations 660

Ivan Stoychev, Jürgen Oehm
Ruhr-Universität Bochum, Germany

New Design of RF-DC Rectifier Circuit for Radio Frequency Energy Harvesting 664

Mohamed Mokhlès Mnif, Hassene Mnif, Mourad Loulou
LETI, Tunisia

A Smart All-Digital Charge to Digital Converter 668

Yuqing Xu, Delong Shang, Fei Xia, Alex Yakovlev
Newcastle University, United Kingdom

Utilizing Electromechanical Energy Harvesting in Vehicle Suspension Vibration Damping 672

Amr Adly, Mohammed Adly
Cairo University, Egypt

C2P-H Signal Processing Circuits

Date: Wednesday, December 14, 2016

Time: 14:00 - 15:00

Room: Poster Area 3

Chair(s): Mounir Boukadoum; *UQAM, Canada*

An Evaluation of Hybrid Tone Reservation Method for PAPR Reduction Using Power Amplifier with Memory Effects..... 676

Sohtsinda Hermann, Bachir Smail, Perrine Clency, Duvanaud Claude

Université de Poitiers / XLIM Research Institute, France

Low-Power Low-Voltage CMOS Analog Signal Processing Circuits Using a Functional Core..... 680

Cosmin Radu Popa

University Politehnica of Bucharest, Romania

C2P-J RF Techniques

Date: Wednesday, December 14, 2016
Time: 14:00 - 15:00
Room: Poster Area 4
Chair(s): Luca Aluigi; ASK (*Italy*)
Domenico Pepe; *Univ. of Modena & Reggio E. (Italy)*

Amplitude Demodulation Based on Synchronized Sampling by a PLL Circuit 684

Zied Koubaa², Mohamed Ali², René Jr. Landry¹, Mohamad Sawan²
¹*École de Technologie Supérieure / Université Du Québec, Canada;* ²*Polytechnique
Montréal, Canada*

Broadly Tunable Frequency Division Duplex Transceiver: Theory and Operation 688

Hazal Yuksel², Dong Yang¹, Zachariah Boynton², Emory Enroth², Thomas Tapen²,
Alyosha Molnar², Alyssa Apsel²
¹*Broadcom Ltd., United States;* ²*Cornell University, United States*

**Power Optimized Reading Procedure for RFID (EPC Gen 2) Data Transmission
Enabled Application, Example of a Wireless Temperature Sensor 692**

Mathieu Coumba Faye¹, Emmanuel Bergeret¹, Jean Gaubert¹, Philippe Pannier¹,
Damien Jausseran², Christophe Moreaux²
¹*Aix Marseille Université, France;* ²*INVIA, France*

C2P-K Image and Video Processing

Date: Wednesday, December 14, 2016
Time: 14:00 - 15:00
Room: Poster Area 5
Chair(s): Eduardo Costa; *UCPEL (Brasil)*
Jose Guntzel; *UFSC (Brasil)*

Evaluation of Chroma Subsampling for High Dynamic Range Video Compression 696

Ronan Boitard², Mahsa Pourazad¹, Panos Nasiopoulos²
¹*Telus Communications, Canada;* ²*University of British Columbia, Canada*

Application Specific Image Processor for the Extension of the Dynamic Range of Images with Multiple Resolutions 700

Gian Domenico Licciardo, Carmine Cappetta, Luigi Di Benedetto
Università degli Studi di Salerno, Italy

Coarse Grain Partial Distortion Elimination for Hadamard Me in HEVC 704

Ismael Seidel², José Luís Guntzel², Luciano Agostini¹
¹*Universidade Federal de Pelotas, Brazil;* ²*Universidade Federal de Santa Catarina, Brazil*

A Highly Parallel 4K Real-Time HEVC Fractional Motion Estimation Architecture for FPGA Implementation 708

Jorge Soto Leon¹, Carlos Silva Cardenas¹, Ernesto Cristopher Villegas Castillo²
¹*Pontificia Universidad Católica del Perú, Peru;* ²*Universidade de São Paulo, Brazil*

C3L-A Embedded Systems Architecture

Date: Wednesday, December 14, 2016
Time: 15:30 - 17:10
Room: Auric-2
Chair(s): Sergio Bampi; *UFRGS (BR)*
Sara Ghoreishizadeh

Extending FreeRTOS to Support Dynamic and Distributed Mapping in Multiprocessor Systems 712

Gean Abich², Marcelo Mandelli¹, Felipe Rosa², Fernando G. Moraes¹, Luciano Ost³, Ricardo Reis²

¹*Pontifícia Universidade Católica do Rio Grande do Sul, Brazil*; ²*Universidade Federal do Rio Grande do Sul, Brazil*; ³*University of Leicester, United Kingdom*

Architecting a Computer with a Full Optical RAM 716

Jorge Gonzalez, Lois Orosa, Rodolfo Azevedo
Universidade Estadual de Campinas, Brazil

An Investigation on FPGA Based Energy Profiling of Multi-Core Embedded Architectures 720

Marius Marcu, Madalin Ghenea, Cosmin Cernazanu-Glavan, Marian Ionascu
Politehnica University of Timisoara, Romania

Reducing the Energy of a Large Hybrid Cache 724

Jiacong He, Joseph Callenes-Sloan
University of Texas at Dallas, United States

C3L-B Analog Functional Blocks

Date: Wednesday, December 14, 2016

Time: 15:30 - 17:10

Room: Auric-3

Chair(s): Herve Barthelemy; *Université de Toulon*

A 0.003-mm² 50-mW Three-Stage Amplifier Driving 10-nF with 2.7-MHz GBW 728

Davide Marano¹, Alfio Dario Grasso², Gaetano Palumbo², Salvatore Pennisi²

¹*Istituto Nazionale di Astrofisica / Osservatorio Astrofisico di Catania, Italy;* ²*Università degli Studi di Catania, Italy*

Bandwidth Optimization of CMOS Two-Stage Operational Amplifiers Under Power

Consumption and Area Constraints 732

Riccardo Zurla, Alessandro Cabrini, Guido Torelli

Università degli Studi di Pavia, Italy

Low-Power Comparator in 65-nm CMOS with Reduced Delay Time 736

Mohammad Tohidi, Jens K. Madsen, Martijn J. R. Heck, Farshad Moradi

Aarhus University, Denmark

Design of a Compact and Low Supply Voltage CMOS Voltage Reference Generator 740

Pinar Basak Basyurt², Edoardo Bonizzoni³, Franco Maloberti³, Devrim Yilmaz Aksin¹

¹*Analog Devices, Inc., Turkey;* ²*Istanbul Technical University, Turkey;* ³*Università degli Studi di Pavia, Italy*

C3L-C SS8. Electronic Interfaces of Heterogeneous Miniatures Systems for Smart Autonomous Sensors

Date: Wednesday, December 14, 2016
Time: 15:30 - 17:10
Room: Auric-1
Chair(s): Dimitri Galayko; *UPMC-Sorbonne, LIP6, France*

Towards Autonomous Microscale Systems: Progress in Electrostatic Kinetic Energy Harvesting..... 744

Elena Blokhina², Dimitri Galayko¹
¹*Universite Pierre et Marie-Curie / Universite Pairs-Sorbonne, France;* ²*University College Dublin, Ireland*

RF Energy Harvesting Chip Powered Sensor Node..... 748

Younus Syed, Bharat G. Hegde, T. V. Prabhakar, Manjunath M, K J Vinoy
Indian Institute of Science, India

Design of Self-Sustained CMOS Amplifiers for All-CMOS MEMS Based Oscillators 752

Arantxa Uranga, Guillermo Sobreviela, Marti Riverola, Francesc Torres, Nuria Barniol
Universitat Autònoma de Barcelona, Spain

Monolithic Integration of Mutually Injection-Locked CMOS-MEMS Oscillators for Differential Resonant Sensing Applications 756

Pierre Prache¹, Pietro Maris Ferreira¹, Nuria Barniol², Jerome Juillard¹
¹*CentraleSupélec, France;* ²*Universitat Autònoma de Barcelona, Spain*

Remote RF Powering of Ambient Sensors 760

John Nicot, Thierry Taris
IMS Laboratory, France

C3L-E Design and Test

Date: Wednesday, December 14, 2016
Time: 15:30 - 17:10
Room: Apollinaire-1
Chair(s): Patrick Girard; *LIRMM, France*

Lightweight Hardware Architectures for Fault Diagnosis Schemes of Efficiently-Maskable Cryptographic Substitution Boxes..... 764

Mehran Mozaffari Kermani², Reza Azarderakhsh¹
¹*Florida Atlantic University, United States;* ²*Rochester Institute of Technology, United States*

Fault Diagnosis Schemes for Secure Lightweight Cryptographic Block Cipher RECTANGLE Benchmarked on FPGA 768

Anita Aghaie², Mehran Mozaffari Kermani², Reza Azarderakhsh¹
¹*Florida Atlantic University, United States;* ²*Rochester Institute of Technology, United States*

Timing Error Mitigation in Microprocessor Cores 772

Stefanos Valadimas¹, Angela Arapoyanni¹, Yiorgos Tsiatouhas²
¹*National and Kapodistrian University of Athens, Greece;* ²*University of Ioannina, Greece*

Accessing on-Chip Temperature Health Monitors Using the IEEE 1687 Standard..... 776

Ghazanfar Ali, Ahmed Badawy, Hans Kerkhoff
Universiteit Twente, Netherlands

..... 7, \$

Öäã [} ÀËÜç^ãæÅ^i* ä Áœ] æÖæã|ÁÖÄ [|! ÊÖã~ æã[ÁËÄ ÊãÖi~ :