

Table of Contents

Reduction of Parity Overhead in a Subset of Orthogonal Latin Square Codes	1
<i>Pedro Reviriego, Shanshan Liu, Alfonso Sánchez-Macián, Liyi Xiao and Juan Antonio Maestro</i>	
Compact 3D-Printed Folded Branch-Line Hybrid Coupler based on Helical-Microstrip Transmission Lines	6
<i>Arnau Salas Barenys, Neus Vidal and Jose Maria Lopez Villegas</i>	
Design and Characterization of Non-planar 3D-printed Passive UHF-RFID Tag	11
<i>Neus Vidal, Arnau Salas, Aleix Garcia-Miquel, Jordi Romeu, Giselle González, Lluís Jofre and Josep MÁ^a López-Villegas</i>	
Electronic control board for student Rocket	15
<i>Jesús Lázaro, Laura Burgos, Leire Muguirra, Armando Astarloa and Jaime Jiménez</i>	
A Memristor-based Quaternary Memory with Adaptive Noise Tolerance	20
<i>Antonio Rubio, Arezoo Dabaghi Zarandi and Mohammad Reza Reshadinezhad</i>	
A Very Low SEF Neural Amplifier by Utilizing a High Swing Current-Reuse Amplifier	26
<i>Kebria Naderi, Erwin Habibzadeh Tonekabony Shad, Ali Heidari, Marta Molinas and Trond Ytterdak</i>	
Synchronizing NTP Referenced SCADA Systems Interconnected by High-availability Networks	30
<i>Armando Astarloa, Mikel Rodríguez, Francisco Durán, Jaime Jiménez and Jesús Lázaro</i>	
Autonomous self-powered potentiostat architecture for biomedical wearable applications.	36
<i>Javier Aguilar, Albert Alvarez-Carulla, Valeria Colmena, Oscar Carreras, Genís Rabost-Garcia, Manel Puig-Vidal, Jordi Colomer-Farrarons, Xavier Muñoz, Pere Miribel-Catala and Jaime Punter-Villagrasa</i>	
Risc-V processors design: a methodology for cores development	42
<i>Angel Barriga</i>	
A physically based SPICE model for RRAMs including RTN	48
<i>G. González-Cordero, M.B. González, F. Campabadal, F. Jiménez-Molinos and J.B. Roldan</i>	
Design of a SoC Architecture for the Edge Computing of NILM Techniques	54
<i>Alvaro Hernandez, Ruben Nieto, David Fuentes and Jesus Ureña</i>	
Switched Capacitors Charge Pump with floating Topology for a high-efficient Solar Energy Harvester	60
<i>Alberto López Gassó, Andoni Beriain, Hector Solar and Roc Berenguer</i>	
A 16bit 50kHz 177dB-FOMS Calibration-Free Bootstrapping-Free SC Delta-Sigma Modulator IP Block for Low-Power High-Resolution ADCs	65
<i>Alejandro Suanes, Michele Dei, Lluís Terés and Francisco Serra-Graells</i>	
A metamodel-based adaptive sampling approach for efficient failure region characterization of integrated circuits	71
<i>Ingrid Kovacs, Marina Topa, Monica Ene, Andi Buzo and Georg Pelz</i>	

Secure Critical Traffic of the Electric Sector over Time-Sensitive Networking.....	76
<i>Leire Muguira, Jesús Lázaro, Sara Alonso, Armando Astarloa and Mikel Rodriguez</i>	
Evolution of the Performance of Pipelined FFT Architectures Through the Years.....	82
<i>Mario Garrido</i>	
Behavioral modeling of multilevel HfO ₂ -based memristors for neuromorphic circuit simulation	88
<i>Antonio J. Pérez-Ávila, Gerardo González-Cordero, Eduardo Pérez, Emilio Pérez-Bosch Quesada, Mamathamba Kalishettyhalli Mahadevaiah, Christian Wenger, Juan B. Roldán and Francisco Jiménez-Molinos</i>	
Selection of SRAM Cells for improved Reliability PUF implementation using Cell Mismatch Metric.....	94
<i>Abdel Rahman Naser Abed Alrazzaq Alheyasat, Gabriel Torrens, Sebastia Bota and Bartomeu Alorda</i>	
Analysing the interference of Xen hypervisor in the network speed.....	100
<i>Sara Alonso, Jesús Lázaro, Jaime Jiménez, Leire Muguira and Alejandro Largacha</i>	
Designing bioimpedance based sensors for cell cultures test	106
<i>Pablo Pérez, Juan Alfonso Serrano, Gloria Huertas and Alberto Yúfera</i>	
Towards GPU Accelerated HyperSpectral Depth Estimation in Medical Applications	112
<i>Jaime Sancho, Gemma Urbanos, Luisa Ruiz, Marta Villanueva, Gonzalo Rosa, Alberto Martín, Manuel Villa, Miguel Chavarrías, Alfonso Lagares, Rubén Salvador, Eduardo Juárez and César Sanz</i>	
On Structured Design Space Exploration for Mapping of Quantum Algorithms	118
<i>Medina Bandic, Hossein Zarein, Eduard Alarcon and Carmen G. Almudever</i>	
Improvement of the PF Using Symmetrical Angle Switched Single- & Three-Phase Rectifiers in Micro Hydro Power Plants.....	124
<i>Henry Bory-Prevez, Herminio Martinez-Garcia, Luis Vázquez Seisedos and Encarna Garcia-Vilchez</i>	
Distributed power amplifier in GaN technology with tapered drain lines	129
<i>José L. Saiz-Pérez, Javier del Pino, Sunil L. Khemchandani, Mario San-Miguel-Montesdeoca, Daniel Mayor-Duarte and Sergio Mateos-Angulo</i>	
Hyperspectral Images Acquisition: an Efficient Capture and Processing Stitching Procedure for Medical Environments	133
<i>Gonzalo Rosa, Marta Villanueva, Jaime Sancho, Gemma Urbanos, Luisa Ruiz, Manuel Villa, Alberto Martín, Eduardo Juárez, Luis Jiménez, Miguel Chavarrías, Alfonso Lagares and César Sanz</i>	
Short-circuit Analysis using a Parallel QBF Solver.....	139
<i>Rafael Santos, João Afonso and Jose Monteiro</i>	
Multiclass Brain Tumor Classification Using Hyperspectral Imaging and Supervised Machine Learning	145
<i>Luisa Ruiz, Alberto Martín, Gemma Urbanos, Marta Villanueva, Jaime Sancho, Gonzalo Rosa, Manuel Villa, Miguel Chavarrías, Ángel Pérez, Eduardo Juarez, Alfonso Lagares and Cesar Sanz</i>	

Evaluation of a Reduced Precision Redundancy FFT Design	151
<i>Luis Ángel García Astudillo, Almudena Lindoso, Marta Portela and Luis Entrena</i>	
On licenses for [Open] Hardware	157
<i>Màrius Montón and Xavier Salazar</i>	
Will Quantum Computers Scale Without Inter-Chip Comms? A Structured Design Exploration to the Monolithic vs Distributed Architectures Quest	163
<i>Santiago Rodrigo, Sergi Abadal, Eduard Alarcon and Carmen G. Almudever</i>	
An ultra-low power deep sub-micron fast start-up circuit with added line regulation	169
<i>Asghar Bahramali, Marisa Lopez-Vallejo and Carlos Lopez Barrio</i>	
Privacy-enabled system based on Elliptic Curve Cryptography to reduce risks of contagion in pandemics	174
<i>Luis Parrilla, Encarnacion Castillo and Antonio García</i>	
An Academic RISC-V Silicon Implementation Based on Open-Source Components	180
<i>Jaume Abella, Calvin Bulla, Guillem Cabo, Francisco J. Cazorla, Adrián Cristal, Max Doblas, Roger Figueras, Alberto González, Carles Hernández, César Hernández, Víctor Jiménez, Leonidas Kosmidis, Válistas Kostalabros, Rubén Langarita, Neiel Leyva, Guillem López-Paradís, Joan Marimon, Ricardo Martínez, Jonnatan Mendoza, Francesc Moll, Miquel Moretó, Julián Pavón, Cristóbal Ramírez, Marco A. Ramírez, Carlos Rojas, Abraham Ruiz, Antonio Rubio, Nehir Sonmez, Víctor Soria, Lluís Terés, Osman Unsal, Mateo Valero, Iván Vargas and Luis Villa</i>	
Accelerating the Development of NTRU Algorithm on Embedded Systems	186
<i>Eros Camacho-Ruiz, Macarena C. Martínez-Rodríguez, Santiago Sánchez-Solano and Piedad Brox</i>	
Developing an AI IoT application with open software on a RISC-V SoC	192
<i>Enrique Torres-Sanchez, Jesús Alastruey-Benedé and Enrique Torres-Moreno</i>	
Voltage Multiplier Topologies Comparison for UHF RFID Applications	198
<i>Diego Golpe Molinos, Héctor Solar, Andoni Beriain and Roc Berenguer</i>	
Hyperspectral Imaging for Major Neurocognitive Disorder Detection in Plasma Samples ..	204
<i>Raquel Leon, Beatriz Martínez-Vega, Himar Fabelo, Samuel Ortega, Gustavo M. Callicó, Francisco Javier Balea Fernández and Cristina Bilbao Sieyro</i>	
Data flow analysis from UML/MARTE models based on binary traces	210
<i>Hector Posadas, Javier Merino and Eugenio Villar</i>	
High-Speed and Energy-Efficient Ring-Oscillator for Analog-to-Digital Conversion	216
<i>Leidy Mabel Alvero Gonzalez, Luis Hernandez Corporales and Eric Gutierrez Fernandez</i>	
STDP Design Trade-offs for FPGA-Based Spiking Neural Networks	221
<i>Rafael Medina Morillas and Pablo Ituero</i>	
Hardware architecture for integrate-and-fire signal reconstruction on FPGA	227
<i>Guilherme Carvalho, João Canas Ferreira and Vítor Grade Tavares</i>	
A Current-Attenuator for Performing Read Operation in Memristor-Based Spiking Neural Networks	233
<i>Javad Ahmadi Farsani, Bernabe Linares-Barranco and Teresa Serrano-Gotarredona</i>	

DAC mismatch shaping in Discrete Time Sigma Delta ADCs with non uniform quantizer .	237
<i>Pablo Vera and Susana Paton</i>	
Oscillatory Hebbian Rule (OHR): An adaption of the Hebbian rule to Oscillatory Neural Networks	243
<i>Jafar Shamsi, Maria Jose Avedillo, Bernabe Linares-Barranco and Teresa Serrano-Gotarredona</i>	
FPGA Implementation of Random Vector Functional Link Networks based on Elementary Cellular Automata	249
<i>Alejandro Morán Costoya, Vicente José Canals Guinand, Miguel Jesús Roca Adrover, Eugenio Miguel Isern Riutort and José Luis Rosselló Sanz</i>	
A Hardware-Accelerated Qubit Control System for Quantum Information Processing	255
<i>Nizar Messaoudi, Clayton Crocker and Marc Almendros</i>	
FrailWear: A Wearable IoT Device for Daily Activity Monitoring of Elderly Patients	260
<i>Sergio Lluva, J. Manuel Villadangos, J. Jesús García Domínguez, Ana Jiménez and David Gualda</i>	
Simple single particle model for interpreting fast charge results in intercalation batteries ..	266
<i>Juan Antonio López-Villanueva, Salvador Rodríguez-Bolívar, Luis Parrilla and César Fiñana</i>	
Statistics-based Classification Approach for Hyperspectral Dermatologic Data Processing .	271
<i>Beatriz Martínez-Vega, Eduardo Quevedo, Raquel Leon, Himar Fabelo, Samuel Ortega, Gustavo M. Callico, Irene Castaño, Gregorio Carretero, Pablo Almeida, Aday García, Javier A. Hernandez, Stig Uteng and Fred Godtliebsen</i>	
System Dependability in Edge Computing Wearable Devices	277
<i>Alberto Ramírez-Barcenas, Marta Portela-García, Mario García-Valderas and Celia Lopez-Ongil</i>	
A Design Space Exploration for Heart Rate Variability in a Wearable Smart Device	283
<i>Jose Angel Miranda Calero, Manuel Felipe Canabal, Laura Gutierrez Martin, Jose M. Lanza-Gutierrez and Celia Lopez-Ongil</i>	
Algorithm-architecture optimization for Linear and Parabolic Regression on reconfigurable platforms.....	289
<i>Samuel López</i>	
Electrodermal Activity Smart Sensor Integration in a Wearable Affective Computing System.....	295
<i>Manuel F. Canabal, Jose Angel Miranda Calero, Jose M. Lanza-Gutierrez, Antonia Isabel Perez Garcilopez and Celia Lopez-Ongil</i>	
Microarchitectural Isolation Guarantees Through Execution Based Signatures	301
<i>Samira Briongos, Pedro Malagón, José M. Moya and Thomas Eisenbarth</i>	
Novel Methodology for Alzheimer’s Disease Biomarker Identification in Plasma using Hyperspectral Microscopy	307
<i>Himar Fabelo, Raquel Leon, Samuel Ortega, Francisco Balea-Fernandez, Cristina Bilbao, Gustavo M. Callico and Ana Wagner</i>	

Evaluation of Software Inter-Processor Synchronization Methods for the Zynq-UltraScale+ Architecture.....	313
<i>Rubén Nieto Capuchino, Edel Díaz Llerena, Raúl Mateos Gil and Álvaro Hernández Alonso</i>	
A Smart Dental Prosthesis to Restore Dental Proprioceptivity.....	319
<i>José Machado Da Silva, Ilaria Cerrone, Daniel Malagon, Stephen Mundy, Joaquim Mendes, Jorge Marinho and João Gaspar</i>	
Round-off noise estimation of fixed-point algorithms using Modified Affine Arithmetic and Legendre Polynomials.....	325
<i>Luis Esteban, Juan Antonio Lopez and Alberto Regadio</i>	
Can be used Hyperspectral Images to detect Brain tumor pixels and their malignant phenotypes?	331
<i>Alicia Martínez-González, Ana Del Valle, Himar Fabelo, Samuel Ortega and Gustavo Callicó</i>	