2017 Panhellenic Conference on Electronics and **Telecommunications** (PACET 2017)

Xanthi, Greece 17-18 November 2017



IEEE Catalog Number: CFP17PAF-POD ISBN:

978-1-5386-2288-9

Copyright \odot 2017 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:
 CFP17PAF-POD

 ISBN (Print-On-Demand):
 978-1-5386-2288-9

 ISBN (Online):
 978-1-5386-2287-2

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



TABLE OF CONTENTS

١o.	Papers	Authors	Page
1	Less is More: Increasing the Scope of Hardware Debugging with Compression	Fotis Kostarelos, George Charitopoulos and Dionisios Pnevmatikatos	1
2	Real Number Modeling of a Flash ADC Using SystemVerilog	Nikolaos Georgoulopoulos and Alkiviadis Hatzopoulos	5
3	A new threshold-voltage compensation technique of IGZO and LTPS for AMOLED display pixel circuit	Panagiotis Vosniadis and Stylianos Siskos	9
4	Carbon Fiber Electrodes Enhanced with Graphene Oxide for Supercapacitors	Ioannis Gkionis, Martha Vakalopoulou-Paschalidou, Dimitrios-Panagiotis Argyropoulos, Filippos Farmakis, Costas Elmasides and Nikolaos Georgoulas	13
5	Bridging Si3N4 waveguide and gold (Au) based hybrid plasmonic slot waveguide	Athanasios Manolis, Dimitra Ketzaki, George Dabos, Dimitris Tsiokos and Nikos Pleros	17
6	Analog front end of the Extremely low frequency station at Ioannina in Greece for the measurement of Schumann resonances	Constantinos Votis, Giorgos Tatsis, Vasilis Christofilakis, Panos Kostarakis, Vasilis Tritakis and Christos Repapis	21
7	Quadruple-fed Supershape Patch Radiator with Enhanced Bandwidth Operation	Anastasios Koutinos, Georgios Ioannopoulos, Michael Chryssomallis and Georgios Kyriacou	25
8	Investigation of the construction of the phase shifter based on a 3-dB directional coupler	Denis Letavin and Sergey Shabunin	29
9	An Extended Study of Extreme Multistability in a Memristive Circuit	Dimitrios Prousalis, Christos Volos, Ioannis Stouboulos, Ioannis Kyprianidis and Dimitrios Frantzeskakis	33
10	Towards an analytical description of a TaO memristor	Alon Ascoli, Vasileios Ntinas, Ronald Tetzlaff and Georgios Ch. Sirakoulis	37
11	Chaotic Synchronization in Coupled Neuronal Circuits via a Memristor	Dimitrios Prousalis, Christos Volos, Ioannis Stouboulos, Ioannis Kyprianidis, Hector Nistazakis and George Tombras	41
12	Hardware Emulation of Phase Change Memory	Anastasios Petropoulos and Theodore Antonakopoulos	45
13	Crossbar Sector Addressing Scheme on SRAMs	Lazaros Spyridopoulos, Theodoros Simopoulos, Nikos Konofaos and George Alexiou	49
14	Multilevel Inverters for Motor Drives and Wireless Power Transfer Applications	Dimitris Baros, Konstantinos Bampouras, Parthena Apostolidou, Evangelos Ioannou and Nick Papanikolaou	53
15	Capacitive Output Filter Effect on Series-Series Inductive Power Transfer Systems Operating in Asymmetric Loading Mode	Eleni Gati and Stefanos Manias	59
16	Experimental survey on active thermoelectric cooling driven by PWM techniques	Alexandros Boubaris, Emmanuel Karampasis, Dionisis Voglitsis and Nick Papanikolaou	63

17	Investigation of the operation of an electric city car equipped with electronic differential using CAN-enabled monitoring	Nikolaos Milas, Emmanuel Tatakis and Epaminondas Mitronikas	67
18	Survey of the effects originating from the integration of a new regenerative braking system in electric lifts drives	Dionisis Voglitsis, Dimitris Baros, Nick Papanikolaou and Epaminondas Mitronikas	71
19	Investigation of the Operational Behavior of a DC/DC High Step Up R2P2 Converter	Marianthi Pefkianaki, Charoula Zogogianni and Emmanuel Tatakis	77
20	Efficient coupling between thin-film plasmonic and SiN photonic waveguide	Evangelia Chatzianagnostou, George Dabos, Dimitra Ketzaki, Dimitris Tsiokos and Nikos Pleros	81
21	Microring resonator design with application to performance improvement of optically or electrically modulated semiconductor optical amplifiers	Zoe Rizou and Kyriakos Zoiros	85
22	Implementation of an All-Optical Buffer & Time-Slot-Interchanger based on Integrated SOI delay lines	George Mourgias-Alexandris, Miltiadis Moralis- Pegios, Nikos Terzenidis, Konstantinos Vyrsokinos and Nikos Pleros	88
23	Single Equivalent Dipole Inverse Electrocardiography based on ordinary 12 leads recordings	Amalia Saliakoura, Georgia Theodosiadou, Alexandros Rigas, George Kyriacou and Michalis Zervakis	92
24	Biomedical and Biological Applications of Fractional-Order Circuits	Costas Vastarouchas and Costas Psychalinos	97
25	Laboratory Jitter Removal Circuit for Single-bit All- Digital Frequency Synthesis	Adam Raptakis, Costas Oustoglou and Paul Sotiriadis	101
26	Capacitorless Fractional-Order Filters and Capacitor/Inductor Emulators	Panagiotis Bertsias and Costas Psychalinos	105
27	Rail-to-Rail Operational Amplifier with Stabilized Frequency Response and Constant-gm Input Stage	Nikolaos Baxevanakis, Ioannis Georgakopoulos and Paul P. Sotiriadis	109
28	Efficient All-Digital Frequency Synthesizer Based on Multi-Step Look-Ahead Sigma-Delta Modulation	Nick Temenos, Charis Basetas and Paul Sotiriadis	113
29	Noise Shaping Advantages of Band-Pass Multi-Step Look-Ahead Sigma-Delta Modulators Over Conventional Ones in Signal Synthesis	Nick Temenos, Charis Basetas and Paul P. Sotiriadis	117
30	Wireless Self Powered Environmental Monitoring System for Smart Cities based on LoRa	Konstantinos Tzortzakis, Konstantinos Papafotis and Paul P. Sotiriadis	121
31	Realizing Virtual Output Queues in High Throughput Data Center Nodes	Angelos Kyriakos, Ioannis Patronas, Georgios Tzimas, Vasileios Kitsakis and Dionysios Reisis	125
32	An Interference Based Dynamic Channel Access Algorithm for Dense WLAN deployments	Anastasios Valkanis, Athanasios Iossifides and Periklis Chatzimisios	129
33	Conductivity Distribution Measurement at Different Low Frequencies Using a Modular 64 Electrode Electrical Impedance Tomography	Christos Dimas and Paul Sotiriadis	133

	System		
34	RBM-based Hardware Accelerator for Handwritten Digits Recognition	Nikolaos Toulgaridis, Eleni Bougioukou and Theodore Antonakopoulos	137
35	A CMOS Closed Loop AMR Sensor Architecture	Ioannis Georgakopoulos, Neoklis Hadjigeorgiou and Paul P. Sotiriadis	141
36	A Wireless Built Three Dimensional Printer For Printed Circuit Board Applications	George Isaakidis, Antonis Spiropoulos and Maria Drakaki	145
37	A Novel Methodology for Sailing Boat Waterline Plane Definition Using 3D Point Cloud	Kleanthis Xenitidis, Vassilios Mardiris and Vassilios Chatzis	149
38	An Internet of Things Humanoid Robot Teleoperated by an Open Source Android Application	Georgios Angelopoulos, Georgios Theodoros Kalampokis and Minas Dasygenis	153
39	A VHDL implementation of the Hummingbird cryptographic algorithm	Stavroula Mammou, Dimitrios Balobas and Nikos Konofaos	157
40	A toolset for the design of embedded systems, enabling HW/SW co-simulation, performance and source code generation	Michael Loupis	161
41	SIMO PPM Optical Wireless Communication System over Gamma Turbulence Channels with Generalized Pointing Errors	Michail Ninos, Hector Nistazakis, George Tombras and Christos Volos	165
42	Coverage Area Estimation for High Performance eSSK Visible Light Communication Systems	Spiridoula Menounou, Argyris Stassinakis, Hector E. Nistazakis, George Tombras and Harilaos Sandalidis	169
43	Design and Implementation of Quantum Circuits for Fault-Tolerant Architectures	Konstantinos Prousalis and Nikos Konofaos	173
44	A monitoring system for people living with Alzheimer's disease	Irene- Maria Tabakis, Minas Dasygenis and Magda Tsolaki	177
45	The MapReduce application of Matrix Multiplication implemented on Field Programmable Gate Arrays	Michail - Antisthenis Tsompanas and Georgios Ch. Sirakoulis	181