MOCAST

INTERNATIONAL CONFERENCE ON
MODERN CIRCUITS AND SYSTEMS TECHNOLOGIES

6th INTERNATIONAL CONFERENCE ON MODERN CIRCUITS AND SYSTEMS TECHNOLOGIES

May 4-6, 2017

Aristotle University Dissemination Center (ΚΕΔΕΑ)

Thessaloniki,

Greece

PROGRAM

AUTH e-LAB

Aristotle University of Thessaloniki-Electronics Laboratory

Thursday, May 4

8:30 - 9:30	**Registration**
9:30 – 10:00	**Opening session** **General Chair: Prof. S. Nikolaidis,** Department of Physics, AUTH, Greece. **Vice Rector: Prof. Th. Laopoulos,** Department of Physics, AUTH, Greece. **Program Chair: Prof. S. Goudos**, Department of Physics, AUTH, Greece. **Student Contest Chair: Dr. C.-L. Sotiropoulou** , University of Pisa – INFN, Italy.
10:00-11:00	**Hall: ΑΜΦ ΙΙ** **Keynote Speech**
	"Bio/CMOS interfaces for Ultrasensitive Memristive Biosensors" **Prof. Sandro Carrara, IEEE Fellow, EPFL Lausanne, Switzerland.** **Chair: Dr. Calliope-Louisa Sotiropoulou** **Abstract:** In this keynote, the very best worldwide ever-reported electrochemical biosensors based on a memristive effect and aptamers or antibodies are presented. These novel sensing devices are developed to propose a completely new approach in cancer diagnostics. In this research, affinity-based techniques are presented for the detection of the prostate specific antigen (PSA) and the Vascular Endothelial Growth Factor (VEGF). The hysteretic properties of memristive silicon nanowires functionalized with proper biomolecules provide a label-free and ultrasensitive bio-detection technique. In order to develop full systems for diagnostics, the integration with CMOS frontend, in one side of the interface, and microfluidics, in the other side, is required too. Therefore, this talk also discusses novel circuit approaches for an automated and quick characterization of arrays of memristive biosensors. One memristive parameter, the width of the voltage gap, is directly proportional to the target molecules concentration. Thus, CMOS readouts acquiring such width, meanwhile sorting-out faulty devices, i.e. non-conducting nanowires in the array, are presented together with analog-to-digital conversion for the acquired voltage gap. A first prototype of these circuits is shown as designed in 0.35µm CMOS technology. The integration of the CMOS readout with the nanoscale sensors and a microfluidic platform is a must for the design of robust biosensing-systems for quick data acquisition in cancer diagnostics. Thus, the development of an improved chip-platform for cancer diagnostics based on nanofabricated Memristive Biosensors integrated, for the first time, with a microfluidic structure is also presented in this keynote speech by also addressing critical issues, e.g., the problems related to long connections between the Memristive Biosensors and the CMOS frontend. **Brief Curriculum Vitae:** Sandro Carrara is an IEEE Fellow for his outstanding record of accomplishments in the field of design of nanoscale biological CMOS sensors. He is also the recipient of the IEEE Sensors Council Technical

	Achievement Award in 2016 for his leadership in the emerging area of co-design in Bio/Nano/CMOS interfaces. He is a faculty member (MER) at the EPFL in Lausanne (Switzerland). He is former professor of optical and electrical biosensors at the Department of Electrical Engineering and Biophysics (DIBE) of the University of Genoa (Italy) and former professor of nanobiotechnology at the University of Bologna (Italy). He holds a PhD in Biochemistry & Biophysics from University of Padua (Italy), a Master degree in Physics from University of Genoa (Italy), and a diploma in Electronics from National Institute of Technology in Albenga (Italy). His scientific interests are on electrical phenomena of nano - bio-structured films, and include CMOS design of biochips based on proteins and DNA. Along his carrier, he published 7 books, one as author with Springer on Bio/CMOS interfaces and, more recently, a Handbook of Bioelectronics with Cambridge University Press. He also published more than 200 scientific papers and is author of 12 patents. He is now Editor-in-Chief (Associate) of the IEEE Sensors Journal; he is also founder and Editor-in-Chief of the journal BioNanoScience by Springer, and Associate Editor of IEEE Transactions on Biomedical Circuits and Systems. He is a member of the Board of Governors (BoG) of the IEEE Circuits And Systems Society (CASS). He is member at large of the IEEE Sensors Council. He has been appointed as IEEE CASS Distinguished Lecturer for the years 2013-2014. His work received several international recognitions: several Top-25 Hottest-Articles (2004, 2005, 2008, 2009, and two times in 2012) published in highly ranked international journals such as Biosensors and Bioelectronics, Sensors and Actuators B, IEEE Sensors journal, and Thin Solid Films; a NATO Advanced Research Award in 1996 for the original contribution to the physics of single-electron conductivity in nano-particles; three Best Paper Awards at the IEEE PRIME Conference in 2015 (Glasgow), in 2010 (Berlin), and in 2009 (Cork), a Best Poster Award at the Nanotera workshop in 2011 (Bern), and a Best Poster Award at the NanoEurope Symposium in 2009 (Rapperswil). He also received the Best Referees Award from the journal Biosensor and Bioelectronics in 2006. From 1997 to 2000, he was a member of an international committee at the ELETTRA Synchrotron in Trieste. From 2000 to 2003, he was scientific leader of a National Research Program (PNR) in the field of Nanobiotechnology. He was an internationally esteemed expert of the evaluation panel of the Academy of Finland in a research program for the years 2010-2013. He has been the General Chairman of the Conference IEEE BioCAS 2014, the premier worldwide international conference in the area of circuits and systems for biomedical applications.
11:00-11:30	**Coffee Break**
Hall: ΑΜΦ ΙΙ **Session A1: Analog and mixed signal design and modeling** **Chair: Prof. Nikolaos Konofaos**	
11:30-11:48	All-Digital Single-Bit-Output RF Transmitters Using Homodyne Sigma-Delta Modulation. Paul Peter Sotiriadis and Charis Basetas

11:48-12:06	Fractional Order Four-Phase Oscillator Based on Double Integrator Topology. Ahmed El-Naggar, Lobna Said, Ahmed Radwan, Ahmed Madian and Ahmed M. Soliman
12:06-12:24	Closed-Loop Current-Feedback, Signal-Chopped, Low Noise AMR Sensor With High Linearity. Neoclis Hadjigeorgiou, Paul. P. Sotiriadis and Evagelos Hristoforou
12:24-12:42	Pole-Zero Estimation and Analysis of Op-Amp Design with Negative Miller Compensation. Muhaned Zaidi, Ian Grout and Abu Khari A'Ain
12:42-13:00	A Methodology for Integrated Transformer Compact Modelling. Yiannis Moisiadis, Konstantinos Nikelis and Padelis Papadopoulos
Hall: ΑΜΦ ΙΙΙ **Session B1: Antenna Systems** **Chair: Prof. George Karagiannidis**	
11:30-11:48	Average Error Performance in Subcarrier PSK FSO Links Over Weak Turbulence Channels with Spatial Jitter and Phase Noise. Georgios Varotsos, Hector E. Nistazakis, Wilfried Gappmair and George Tombras
11:48-12:06	Evolutionary Design of a Dual Band E-shaped Patch Antenna for 5G Mobile Communications. Sotirios Goudos, Antonios Tsiflikiotis, Dimitrios Babas, Katherine Siakavara, Christos Kalialakis and George Karagiannidis
12:06-12:24	Design of Overlapping Element Direct Radiating Arrays for Satellite Communications. Theodoros Kaifas, Dimitrios Babas, Govani Toso and John Sahalos
12:24-12:42	MIMO Channel Capacity Increase by Hybrid Non-Uniform EBG Antenna Arrays. Christos Mourtzios and Katherine Siakavara

12:42-13:00	PSK OFDM Optical Wireless Communication Systems with Receiver's Diversity over Gamma-Gamma Turbulence Channels and Spatial Jitter. Michail Ninos, Hector E. Nistazakis, George Latsas, George Tombras and Nikolaos Konofaos
13:00:14:00	**Light Lunch**
14:00-15:00	**Hall: ΑΜΦ ΙΙ** **Keynote Speech**
	"The European Patent Office: protecting technological advancements with European patents" **Yiannis Skoulikaris,** Director, European Patent Office. **Chair: Prof. Alkis Hatzopoulos** **Abstract:** Can software-implemented inventions be patented in Europe? The talk will put special emphasis on such patent applications, and will clarify under which conditions such inventions can be patent-protected. The talk will also give some basic information on the structure and function of the European patenting system, focusing on the operation of the European Patent Office. The European Patent Office (EPO) examines and grants European patents valid in up to 40 European countries. The law governing the operation of the EPO is the European Patent Convention (EPC). The EPO carries out searches and examinations on a steadily rising number of European patent applications. It is also responsible for examining oppositions filed against granted European patents. In second instance, the Boards of Appeal of the EPO are responsible for deciding on appeals filed against negative decisions of the examining and opposition divisions of the EPO. The Boards of Appeal are independent, their decisions being governed solely by the provisions of the European Patent Convention. Publication of the granted patents is fundamental to the European patent system. Moreover, the whole examination procedure is in the public domain and anyone can have access to the documents. This is especially important for fast evolving technologies like ICT (Information Communications Technologies). Inventions implemented in ICT technology, in particular those implementations involving software, can be patented, provided they solve a technical problem. The talk will present examples of such implementations and will give guidance to inventors, stressing the do's and don'ts in this field of technology. **Brief Curriculum Vitae:** Yannis is a Director with the European Patent Office (EPO). He is responsible for operations including search and examination of European patent applications and opposition of European Patents in the field of computer technology, in particular system software. Beyond managing and supervising search, examination and opposition work, he is involved in quality assurance and in drafting the EPO guidelines for examination in software

technology. He has been instrumental in introducing ISO9001 certification in the patent granting procedure in the EPO. His main expertise is in European patenting law and practice in inventions involving software. He has extensively presented on this subject in various fora in Europe and USA.

Yannis holds degrees in Physics (Thessaloniki), Computer Science (Hamburg), has followed training in European Patent Law (Strasbourg), two years of legal studies (London) and recently attended the training for technically qualified judges of the Unified Patent Court (Strasbourg) and training for the EQE (the European Qualifying Examination for patent attorneys). He is a guest lecturer for European Patent Law and Practice at the University of Maastricht and the Washington University in St. Louis. He is fluent in English, German, French and Dutch.

Hall: Φ (-1)
15:00-16:00
Coffee break
Poster Session
Chair: Ioannis Messaris

Designing Moore FSM with Extended Class Codes.

Kamil Mielcarek, Alexader Barkalov and Larysa Titarenko

Code sharing in CPLD-based Moore FSMs.

Alexader Barkalov, Larysa Titarenko and Jacek Bieganowski

Recursive Odd-Even Sorter for Vector Quantizer

Berkin Atila and Burak Kelleci

A Dual Band Antenna Based on a Quarter Mode Substrate Integrated Waveguide.

Marc Alvarez, Christos Kalialakis, Fermin Mira and Sotirios Goudos

An Educational Purpose Built Three Dimensional Printer.

George Isaakidis, Antonis Spiropoulos and Maria Drakaki

A Chaotic System with Equilibria Located on an Open Curve and Its Microcontroller Implementation.

Angelos Giakoumis, Christos Volos, Ioannis Stouboulos, Viet-Thanh Pham and Ioannis Kyprianidis

Circuit Realization of a Fractional-Order Chaotic Jerk System.

Christos Volos, Ioannis Stouboulos, Ioannis Kyprianidis, Viet-Thanh Pham, Jesus Manuel Munoz-Pacheco and Costas Psychalinos

Dead-Beat Synchronization Control in Discrete-Time Chaotic Systems.

Adel Ouannas, Giuseppe Grassi, Ahmad Taher Azar, Ahmed G. Radwan, Christos Volos, Viet-Thanh Pham, Toufik Ziar, Ioannis M. Kyprianidis and Ioannis N. Stouboulos

Chaos Synchronisation Of Continuous Systems Via Scalar Signal.

Giuseppe Grassi, Adel Ouannas, Ahmad Taher Azar, Ahmed G. Radwan, Christos Volos, Viet-Thanh Pham, Toufik Ziar, Ahmed Madian, Ioannis M. Kyprianidis and Ioannis N. Stouboulos

On the Design of the FFT Butterfly Units.

Fotios Ntouskas and Kiamal Pekmestzi

Quantum noise simulation: A software module for QuCirDET.

Konstantinos Prousalis and Nikos Konofaos

Verilog-A Modeling of Organic Electrochemical Transistors.

Petros Sideris, Stylianos Siskos and George Malliaras

Circuit synthesis of an incommensurate fractional order multi-scroll PWL chaotic system.

Ernesto Zambrano-Serrano, Jesus Manuel Muñoz-Pacheco and Eric Campos-Cantón

Machine learning via multimodal signal processing.

Kostas Kokkinidis, Athanasia Stergiaki and Apostolos Tsagaris

Cache activity profiling tool for the LEON4 processor.

Maria Ntogramatzi, Panagiotis Katsaros and Spyridon Nikolaidis

Development of a Modular 64-Electrodes Electrical Impedance Tomography System.

Christos Dimas, Petros Tsampas, Nikolaos Ouzounoglou and Paul Sotiriadis

An approach for estimating adulteration of virgin olive oil with soybean oil using image analysis. Nikolaos Karagiorgos, Nikolaos Nenadis, Dimitrios Trypidis, Kostas Siozios, Stylianos Siskos, Spyridon Nikolaidis and Maria Tsimidou	
Effectiveness Evaluation of the TSV Fault Detection Method Using Ring Oscillators. Nikolaos Georgoulopoulos and Alkiviadis Hatzopoulos	
Block Error Rate Estimation for Wireless Optical Communication Links Over Strong Turbulence Channels with Pointing Errors. Michalis Ninos, Hector E. Nistazakis, A.N. Stassinakis, Georgios Varotsos, Christos Volos and George Tombras	
DF Relayed FSO Communication Systems with Time Dispersion over Gamma Gamma Turbulence and Misalignment. Georgios Varotsos, Hector E. Nistazakis, Michalis Ninos, Andreas Tsigopoulos, Christos Volos and George Tombras	
Derivation of the Transfer Functions of 1-bit Multi-Step Look-Ahead ΣΔ Modulators Using System Identification Methods. Kostas Touloupas, Charis Basetas and Paul Peter Sotiriadis	
Realization of a hardware generator for the Sum of Absolute Difference component. Ioannis Petrousov and Minas Dasygenis	
Hall: ΑΜΦ ΙΙ **Session A2: Digital Circuits and Systems** **Chair: Prof. Kostas Siozios**	
16:00-16:20	Multi-operand logarithmic addition/subtraction based on Fractional Normalization. Giorgos Tsiaras and Vassilis Paliouras
16:20-16:40	Multi Field SRAM Access via Intra-Encoders and Crossbar Addressing Scheme. Theodoros Simopoulos, Lazaros Spyridopoulos, George Alexiou and Nikos Konofaos

16:40-17:00	BTI and HCI Degradation Detection in SRAM Cells. Yiorgos Sfikas and Yiorgos Tsiatouhas
17:00-17:20	Domocus: Lock Free Parallel Legalization in Standard Cell Placement. Panagiotis Oikonomou, Maria Koziri, Antonios Dadaliaris, Thanasis Loukopoulos and Georgios Stamoulis
17:20-17:40	Loop Pipelining in High-Level Synthesis with CCC. Georgios Dimitriou, Michael Dossis and Georgios Stamoulis
17:40-18:00	BPSim : An Integrated Missrate, Area, and Power Simulator for Branch Predictor. Chaobing Zhou, Libo Huang and Qiang Dou
Hall: ΑΜΦ ΙΙΙ **Session B2: Communication Systems** **Chair: Prof. Katherine Siakavara**	
16:00-16:20	Cell Traffic Prediction Using Joint Spatio-Temporal Information. Enrico Lovisotto, Enrico Vianello, Davide Cazzaro, Michele Polese, Federico Chiariotti, Daniel Zucchetto, Andrea Zanella and Michele Zorzi
16:20-16:40	A Preliminary Coverage Study in Millimeter Wave Bands for 5G Communication Networks. Christos Kaitatzis, Achilles Boursianis, Sotirios Goudos and Panagiotis Dallas
16:40-17:00	Hardware Trade-offs for Massive MIMO Uplink Detection Based on Newton Iteration Method. Alexios Thanos and Vassilis Paliouras
17:00-17:20	Flow Anomaly Based Intrusion Detection System for Android Mobile Devices. Panagiotis Radoglou-Grammatikis and Panagiotis Sarigiannidis

17:20-17:40	A Stochastic FDTD Approach for Assessing Random Media Uncertainties in Polar Coordinates. Christos Salis, Theodoros Zygiridis, Panagiotis Sarigiannidis and Nikolaos Kantartzis
17:40-18:00	FabSpace 2.0: A Platform for Application and Service Development based on Earth Observation Data. Charalampos Marantos, Iosif Paraskevas, Kostas Siozios, Josiane Mothe, Colette Menou and Dimitrios Soudris

Friday, May 5

09:20 -10:00	**Registration**
10:00-11:00	**Hall: ΑΜΦ ΙΙ** **Keynote Speech**
	"Internet of Animals: an energy-efficient system for health monitoring and localization of cows" **Prof. Joseph Wout**– Ghent University/iMinds, Belgium **Chair: Prof. Sotirios Goudos** **Abstract**: Due to the increasing herd size on farms, the manual collection of animal health information has become very labour-intensive. This talk will discuss a robust wireless system (Monicow) for animal movement and real-time animal health monitoring. The detection of multiple animal related parameters and their use in advanced data interpretation techniques will allow an automated and early detection of problems such as illness, lameness, or calving. Energy-efficient monitoring sensors and new techniques for increasing the autonomous energy provision are being implemented. Advanced wireless solutions are needed to allow efficient data collection of over a 1000 moving cows at a central server and consultation via a mobile device. The focus of the talk will be on: Techno-economic aspects. On- and off body cow propagation for wireless communication. Accurate indoor and outdoor animal localization and location tracking system. Energy-efficient WBAN with inductively powered nodes. **Brief Curriculum Vitae:** Wout Joseph was born in Ostend, Belgium, on October 21, 1977. He received the M. Sc. degree in electrical engineering and the Ph.D. degree from Ghent University (UGent), Ghent, Belgium, in 2000 and 2005, respectively. From September 2000 to March 2005, he was a Research Assistant with the iMinds/UGent-INTEC (Ghent University — Department of Information Technology). During this period, his scientific work was focused on electromagnetic exposure assessment. His research work dealt with measuring and modeling of electromagnetic fields around base stations for mobile communications related to the health effects of the exposure to electromagnetic radiation. This work led to the Ph.D. degree. Since April 2005, he has been a Postdoctoral Researcher with iMinds-UGent/INTEC. From October 2007 to October 2013, he was a Postdoctoral Fellow of Research Foundation-Flanders (FWO-V). Since October 2009, he has been a Professor in the domain of experimental characterization of wireless communication systems. He is author and coauthor of +400 papers and over 150 journal papers. His professional interests are electromagnetic field exposure assessment, propagation for wireless communication systems, antennas, and calibration. Furthermore, he

	specializes in wireless performance analysis and quality of experience.
11:00-11:30	**Coffee Break**
Hall: ΑΜΦ ΙΙ Student Session A3 on Electronics Chair: Dr. Calliope-Louisa Sotiropoulou	
11:30-11:48	A 1.8V CMOS Chopper Four-Quadrant Analog Multiplier. Dimitrios Baxevanakis and Paul Sotiriadis
11:48-12:06	The Class of 1-bit Multi-Step Look-Ahead ΣΔ Modulators and Their Applications. Charis Basetas and Paul Peter Sotiriadis
12:06-12:24	Spark acceleration on FPGAs: A use case on machine learning in Pynq. Elias Koromilas, Ioannis Stamelos, Christoforos Kachris and Dimitrios Soudris
12:24-12:42	Trigger and readout electronics for the Phase-I upgrade of the ATLAS forward muon spectrometer. Paris Moschovakos
12:42-13:00	Oscillation-based Technique for TSV Post-bond Test Considerations. Stylianos-Georgios Papadopoulos, Vasileios Gerakis and Alkis Hatzopoulos
Hall: ΑΜΦ ΙΙΙ Student Session B3 on Communications Chair: Prof. Theodoros Samaras.	
11:30-11:48	Comparison of Amplitude Detection Techniques for Passive Receivers in Molecular Communications. Georgia Ntouni and George Karagiannidis
11:48-12:06	Performance Improvement of Various Antennas Using Inclusions of Split-Ring Resonators. Eudoxia Magganopoulou, Theodoros Zygiridis, Panagiotis Sarigiannidis and Nikolaos Kantartzis
12:06-12:24	Millimeter Wave Communication in Vehicular Networks: Challenges and Opportunities. Marco Giordani, Andrea Zanella and Michele Zorzi

12:24-12:42	Circular and Square SRR Exploitation as a Means for Wireless Power Transfer. Antonios Pelekanidis, Antonios Lalas, Nikolaos Kantartzis, Theodoros Zygiridis and Panagiotis Sarigiannidis
12:42-13:00	An Arduino-Based Subsystem for Controlling UAVs Through GSM. George Solidakis, Fanourios Tsokas, Michael Batistatos, Nikos Sagias, George Tsoulos, Dimitra Zarbouti and Georgia Athanasiadou
13:00:14:00	**Light Lunch**
Hall: ΑΜΦ II Session A4: Systems and Applications Chair: Prof. Ioannis Kalomoiros	
14:00-14:18	A Time-Aware Code Execution Continuous Monitoring for Safety-Critical Applications. Vasileios Chioktour and Athanasios Kakarountas
14:18-14:36	Cloud Services using Hardware Accelerators: The case of Handwritten Digits Recognition. Eleni Bougioukou, Nikolaos Toulgaridis and Theodore Antonakopoulos
14:36-14:54	A Smart Phone Image Processing Application for Plant Disease Diagnosis. Nikos Petrellis
14:54-15:12	Architecture and Implementation of a Restricted Boltzmann Machine for Handwritten Digits Recognition. Nikolaos Toulgaridis, Eleni Bougioukou and Theodore Antonakopoulos
15:12-15:30	Modular supervisory control for mining process elevator systems. Fotis Koumboulis, Dimitrios Fragkoulis and Vassilios Michalainas
Hall: ΑΜΦ III Special Session B4: Earth Observation and Applications Chair: Prof. D. Soudris	
14:00-14:22	EO Applications in the agricultural sector. George C. Zalidis.

14:22-14:44	Forest Fire Monitoring using EO. Ioannis Bakouros.
14:44-15:06	Earth Observation for Forest Ecosystems Characterization and Monitoring. Mallinis Georgios.
15:06-15:30	FabSpace 2.0: A Platform for Application and Service Development based on Earth Observation Data. Charalampos Marantos , Iosif S. Paraskevas , Kostas Siozios , Josiane Mothe , Colette Menou and Dimitrios Soudris.

Hall: Φ (-1)
15:30-16:30
Coffee break
Poster Session
Chair: Ioannis Messaris

Designing Moore FSM with Extended Class Codes.

Kamil Mielcarek, Alexader Barkalov and Larysa Titarenko

Code sharing in CPLD-based Moore FSMs.

Alexader Barkalov, Larysa Titarenko and Jacek Bieganowski

Recursive Odd-Even Sorter for Vector Quantizer

Berkin Atila and Burak Kelleci

A Dual Band Antenna Based on a Quarter Mode Substrate Integrated Waveguide.

Marc Alvarez, Christos Kalialakis, Fermin Mira and Sotirios Goudos

An Educational Purpose Built Three Dimensional Printer.

George Isaakidis, Antonis Spiropoulos and Maria Drakaki

A Chaotic System with Equilibria Located on an Open Curve and Its Microcontroller Implementation.

Angelos Giakoumis, Christos Volos, Ioannis Stouboulos, Viet-Thanh Pham and Ioannis Kyprianidis

Circuit Realization of a Fractional-Order Chaotic Jerk System.

Christos Volos, Ioannis Stouboulos, Ioannis Kyprianidis, Viet-Thanh Pham, Jesus Manuel Munoz-Pacheco and Costas Psychalinos

Dead-Beat Synchronization Control in Discrete-Time Chaotic Systems.

Adel Ouannas, Giuseppe Grassi, Ahmad Taher Azar, Ahmed G. Radwan, Christos Volos, Viet-Thanh Pham, Toufik Ziar, Ioannis M. Kyprianidis and Ioannis N. Stouboulos

Chaos Synchronisation Of Continuous Systems Via Scalar Signal.

Giuseppe Grassi, Adel Ouannas, Ahmad Taher Azar, Ahmed G. Radwan, Christos Volos, Viet-Thanh Pham, Toufik Ziar, Ahmed Madian, Ioannis M. Kyprianidis and Ioannis N. Stouboulos

On the Design of the FFT Butterfly Units.

Fotios Ntouskas and Kiamal Pekmestzi

Quantum noise simulation: A software module for QuCirDET.

Konstantinos Prousalis and Nikos Konofaos

Verilog-A Modeling of Organic Electrochemical Transistors.

Petros Sideris, Stylianos Siskos and George Malliaras

Circuit synthesis of an incommensurate fractional order multi-scroll PWL chaotic system.

Ernesto Zambrano-Serrano, Jesus Manuel Muñoz-Pacheco and Eric Campos-Cantón

Machine learning via multimodal signal processing.

Kostas Kokkinidis, Athanasia Stergiaki and Apostolos Tsagaris

Cache activity profiling tool for the LEON4 processor.

Maria Ntogramatzi, Panagiotis Katsaros and Spyridon Nikolaidis

Development of a Modular 64-Electrodes Electrical Impedance Tomography System.

Christos Dimas, Petros Tsampas, Nikolaos Ouzounoglou and Paul Sotiriadis

An approach for estimating adulteration of virgin olive oil with soybean oil using image analysis.

Nikolaos Karagiorgos, Nikolaos Nenadis, Dimitrios Trypidis, Kostas Siozios, Stylianos Siskos, Spyridon Nikolaidis and Maria Tsimidou

Effectiveness Evaluation of the TSV Fault Detection Method Using Ring Oscillators.

Nikolaos Georgoulopoulos and Alkiviadis Hatzopoulos

Block Error Rate Estimation for Wireless Optical Communication Links Over Strong Turbulence Channels with Pointing Errors.

Michalis Ninos, Hector E. Nistazakis, A.N. Stassinakis, Georgios Varotsos, Christos Volos and George Tombras

DF Relayed FSO Communication Systems with Time Dispersion over Gamma Gamma Turbulence and Misalignment.

Georgios Varotsos, Hector E. Nistazakis, Michalis Ninos, Andreas Tsigopoulos, Christos Volos and George Tombras

Derivation of the Transfer Functions of 1-bit Multi-Step Look-Ahead ΣΔ Modulators Using System Identification Methods.

Kostas Touloupas, Charis Basetas and Paul Peter Sotiriadis

Realization of a hardware generator for the Sum of Absolute Difference component.

Ioannis Petrousov and Minas Dasygenis

Hall: ΑΜΦ ΙΙ
Special Session A5: Innovative Systems and Circuits for multi-purpose pattern recognition tasks.
Chair: Dr. Alberto Stabile

16:30-16:48	Design of LVDS Driver and Receiver in 28 nm CMOS Technology for Associative Memories. Alberto Stabile, Valentino Liberali, Gianluca Traversi and Francesco De Canio
16:48-17:06	Pop-count Circuits for Associative Memories: a Comparison Study. Alberto Stabile, Luca Frontini and Valentino Liberali

17:06-17:24	A Low-Power and High-Density Associative Memory in 28 nm CMOS technology . Alberto Stabile, Valentino Liberali, Luca Frontini, Annovi Alberto, Calderini Giovanni, Francesco Crescioli, Francesco De Canio, Takashi Kubota, Pierluigi Luciano, Fabrizio Palla, Seyed Ruhollah Shojaii, Calliope-Louisa Sotiropoulou and Gianluca Traversi
17:24-17:42	Power Distribution Network Optimization for Associative Memories. Alberto Stabile, Valentino Liberali and Luca Frontini
17:42-18:00	A Software Demonstrator for Cognitive Image Processing Using the Associative Memory Chip. Stamatios Gkaitatzis, Calliope-Louisa Sotiropoulou, Pierluigi Luciano, Paola Giannetti and Kostas Kordas
Hall: ΑΜΦ III **Special Session B5: Fractional Order and Memristive Systems.** **Chair: Ahmed G. Radwan, Ahmad Taher Azar.**	
16:30-16:48	A Comparative Study between Ordinary and Fractional Order PID Controllers for Modeling and Control of an Industrial system Based On Genetic Algorithm. Magdy Aboelela, Mohammed Essa and Mohammed Hassan
16:48-17:06	A 4D Hyperjerk Memristive System with Hidden Attractors. Dimitrios Prousalis, Christos Volos, Ioannis Stouboulos and Ioannis Kyprianidis
17:06-17:24	FPGA Realization of Caputo and Grünwald-Letnikov Operators. Mohammed Tolba, Amr Abdelaty, Lobna Said, Ahmed Elwakil, Ahmad Taher Azar, Ahmed Madian and Ahmed Radwan
17:24-17:42	Towards Memristive Crossbar-Based Neuromorphic HW Accelerators for Signal Processing. Nikolaos Vasileiadis, Ioannis Vourkas, Angel Abusleme, Georgios Ch. Sirakoulis and Nikolaos Papamarkos

17:42-18:00	Fractional Controllable Multi-Scroll V-Shape Attractor with Parameters Effect. Nancy Soliman, Lobna Said, Ahmad Taher Azar, Ahmed Madian, Ahmed Radwan and Adel Ounnas

21:00 --	**Dinner (If registered)**

Saturday, May 6

9:20 – 10:00	**Registration**
10:00-11:00	**Hall: ΑΜΦ ΙΙ** **Keynote Speech**
	" Ultra low latency video streaming" **Dr. Nikolaos Zervas ,CEO at CAST Inc. Greater New York City Area** **Chair: Prof. Thanos Kakarountas** **Abstract**: Capture to display latency is an important design consideration in a variety of applications using video streaming ranging from advanced driver assistant systems (ADAS) and unmanned vehicles, to video-conferencing and broadcasting. In this keynote a typical end-to-end video streaming system is analyzed and the main latency contributors are identified. The state-of-the-art in latency optimizations are reviewed, and the latency-bottlenecks not yet addressed by current technologies are described. **Brief Curriculum Vitae:** Dr. Nikos Zervas is the CEO of CAST Inc, where he previously served as a VP of Marketing and Engineering, and a COO. Prior to working at CAST, Nikos co-founded Alma Technologies, and served as Chairman and CEO for nine years. Under his leadership Alma Technologies bootstrapped to become a reputable provider of cutting edge image and video compression silicon IP cores. Nikos served on the board of the Hellenic Semiconductor Industry Association from 2009 until 2013, where he was responsible for strategic planning. Nikos received a Diploma and PhD in Electrical and Computer Engineering from University of Patras Greece, in 1997 and 2003 respectively.
11:00-11:30	**Coffee Break**
	Hall: ΑΜΦ ΙΙ **Session A6: High Embedded Systems and Applications** **Chair: Prof. Minas Dasygenis**
11:30-11:50	Heterogeneous computing system platform for high-performance pattern recognition applications. Mohammad Ali Mirzaei, Vincent Voisin, Alberto Annovi, Guillaume Baulieu, Matteo Beretta, Giovanni Calderini, Saverio Citraro, Francesco Crescioli, Geoffrey Galbit, Valentino Liberali, Seyed Ruhollah Shojaii, Alberto Stabile, William Tromeur and Sebastien Viret
11:50-12:10	Design and testing of the high speed signal densely populated ATLAS calorimeter trigger board dedicate to jet identification. Julio Vieira De Souza

12:10-12:30	Track Finding Mezzanine for Level-1 Triggering in HL-LHC Experiments. Christos Gentsos, Giacomo Fedi, Guido Magazzu, Daniel Magalotti, Atanu Modak, Fabrizio Palla, Gian Mario Bilei, Nicolò Biesuz, Suvankar Chowdhury, Francesco Crescioli, Bruno Checcucci, Denis Tcherniakhovski, Geoffrey Galbit, Guillaume Baulieu, Matthias Balzer, Loriano Storchi, Oliver Sander, Sebastien Viret, Leonello Servoli and Spiridon Nikolaidis
12:30-12:50	Implementation of a Motion Estimation Hardware Accelerator on Zynq SoC. Thomas Makryniotis and Minas Dasygenis
12:50-13:10	Implementation of a V/f motor speed controller using a Matrix Converter and Fuzzy Asymmetrical PWM. Gregory Zigirkas and John Kalomiros
13:10-13:30	Testing the Level-1 Data Driver Card for the New Small Wheel of the ATLAS Detector. Ioannis Mesolongitis, Achilleas Gkountis, Efstathios D. Kyriakis – Bitzaros, Katerina Zachariadou, Panagiotis Gkountoumis and Theodoros Alexopoulos
Hall: ΑΜΦ ΙΙΙ **Session B6: System Modeling and Applications** **Chair: Prof. Chistos Volos**	
11:30-11:50	Generalized Family of Fractional-Order Oscillators Based on Single CFOA and RC Network. Lobna Said, Ahmed Radwan, Ahmed Madian and Ahmed Soliman
11:50-12:10	Biomedical Image Encryption Based on Double-Humped and Fractional Logistic Maps. Samar Ismail, Lobna Said, Ahmed Rezk, Ahmed Radwan, Ahmed Madian, Mohamed Abu-Elyazeed and Ahmed Soliman
12:10-12:30	Image Encryption Based on Double-Humped and Delayed Logistic Maps for Biomedical Applications. Samar Ismail, Lobna Said, Ahmed Rezk, Ahmed Radwan, Ahmed Madian, Mohamed Abu-Elyazeed and Ahmed Soliman

12:30-12:50	Chaotic Systems Based on Jerk Equation and Discrete Maps with Scaling Parameters. Wafaa S. Sayed, Ahmed G. Radwan and Hossam A. H. Fahmy
12:50-13:10	On the Analysis of Current-Controlled Fractional-Order Memristor Emulator. Somia Rashad, Esraa Hamed, Mohamed Fouda, Amr Abdelaty, Lobna Said and Ahmed Radwan
13:10-13:30	Memcapacitor Based Charge Pump. Esraa Hamed, Somia Rashada, Lobna Said, Ahmed Radwan and Ahmed Madian

13:40-14:00	MOCAST Awards- Closing ceremony **Chair: Dr. Calliope-Louisa Sotiropoulou.**

Organizing Committee

General Chair

Prof. Spiros Nikolaidis, Aristotle University of Thessaloniki, Greece.

Co-Chairs

Prof. Alkis Hatzopoulos, Aristotle University of Thessaloniki, Greece.

Prof. Traianos Yioultsis, Aristotle University of Thessaloniki, Greece

Technical Program Co-Chairs

Prof. Sotirios Goudos, Aristotle University of Thessaloniki, Greece

Prof. Andrea Zanella, University of Padova, Italy

Publicity Co-Chairs

Prof. Maciej Ogorzalek, Jagiellonian University in Krakow, Poland.

Prof. Thanos Stouraitis, University of Patras, Greece.

Prof. Stelios Siskos, Aristotle University of Thessaloniki, Greece.

Prof. Christos Bouganis, Imperial College London, UK.

Prof. Julius Georgiou, University of Cyprus, Cyprus.

Prof. Fernando Corinto, Politecnico di Torino, Italy.

Prof. George Stamoulis, University of Thessaly, Greece.

Dr. Kostas Doris, NXP Semiconductors, The Netherlands.

Prof. Lazaros Nalpantidis, Aalborg University, Denmark.

Prof. Dimitrios Soudris, National Technical University of Athens, Greece.

Prof. Norocel Dragos Codreanu, Politehnica University of Bucharest, Romania

Prof. Theodore Antonakopoulos, University of Patras, Greece

Prof. Carol De Benito, Universitat de illes balears, Spain.

Prof. Kostas Kordas, Aristotle University of Thessaloniki, Greece

Prof. Apostolos Georgiadis, Heriot-Watt University, UK

Prof. Liljana Gavrilovska, Ss Cyril and Mathodius University in Skopje, FYROM

Prof. Leandro dos Santos Coehlo, Pontifical Catholic University of Parana, Brazil

Prof. Thanos Kakarountas, University of Thessaly, Greece

Prof. Nihad Did, Jordan University of Science and Technology, Jordan

Special Sessions Co-Chairs

Prof. George Sirakoulis, Dimokritus University of Thrace, Greece.

Prof. Yiorgos Tsiatouhas, University of Ioannina, Greece.

Publication Co-Chairs

Prof. Rodrigo Picos, Universitat de illes balears, Spain.

Phd/Master Student Contest Chair

Dr. Calliope-Louisa Sotiropoulou, University of Pisa, Italy.

Local Organizing Committee

Prof. Nikolaos Konofaos, Aristotle University of Thessaloniki, Greece

Prof Christos Volos, Aristotle University of Thessaloniki, Greece

Prof Minas Dasygenis, University of Western Macedonia, Greece

Prof Kostas Siozios, Aristotle University of Thessaloniki, Greece

Alphabetical Index

A

Aboelela,M. 16
Alvarez, et all.....5, 13
Atila,B.....5, 13

B

Bakouros,I. 13
Barkalov, et all 5, 13
Basetas,C.....2, 11
Baxevanakis,D. 11
Bougioukou, et all 12

C

Carrara,S. 1
Chioktour,V. 12

D

Dasygenis,M.....7, 15, 18, 19
De Souza,J.V. 18
Dimas, et all 6, 14
Dimitriou, et all 8

E

El-Naggar, et all..... 3

G

Gentsos, et all 19
Georgoulopoulos, et all.....7, 15
Giakoumis, et all 5, 13
Giordani, et all..... 11
Gkaitatzis, et all..... 16
Goudos,S. 1, 3, 10
Grassi, et all.....6, 14

H

Hadjigeorgiou, et all..... 3
Hamed,E..... 20
Hatzopoulos,A.....4, 7, 15

I

Isaakidis, et all.....5, 13
Ismail, et all 19

K

Kaifas, et all..... 3
Kaitatzis, et all..... 8
Kakarountas,A.....12, 18
Kalomoiros,I. 12, 19
Karagiannidis,G. 11
Karagiorgos, et all 7, 15
Kelleci,B.....5, 13
Kokkinidis, et all 6, 14
Konofaos,N. 2, 6, 14
Koromilas, et all 11
Koumboulis, et all 12

L

Lovisotto, et all 8

M

Magganopoulou, et all..... 11
Makryniotis,T. 19
Mallinis, G. 13
Marantos, et all.....9, 13
Mesolongitis, et all..... 19
Messaris,I. 5, 13
Mielcarek,et all 5, 13
Mirzaei,M.A. 18
Moisiadis, et all 3
Moschovakos,P. 11
Mourtzios, et all 3

N

Nikolaidis,S..... 1
Ninos, et all 4, 7, 15
Ntogramatzi, et all 6, 14

Ntouni,G. 11
Ntouskas,F. 6, 14

O

Oikonomou, et all 8
Ouannas, et all 6, 14

P

Paliouras,V. 7, 8
Papadopoulos, et all 11
Pekmestzi,K. 6, 14
Pelekanidis, et all 12
Petrellis,N. 12
Petrousov,I. 7, 15
Prousalis, et all 16
Prousalis,K. 6, 14

R

Radoglou-Grammatikis,P. 8
Rashad,S. 20

S

Said, et all 19
Salis, et all 9
Sarigiannidis,P. 8
Sayed,W.S. 20
Sfikas,Y. 8
Siakavara,K. 3
Sideris, et all 6, 14
Simopoulos, et all 7
Skoulikaris, Y. 4
Solidakis, et all 12
Soliman, et all 17
Sotiriadis,P.P. 11
Sotiriadis,P.P., et all 2
Sotiropoulou,C.L. 1, 11, 15, 16, 20
Soudris,D. 12
Stabile, et all 15, 16

T

Thanos,A. 8
Tolba, et all 16
Toulgaridis, et all 12
Touloupas, et all 7, 15
Tsiaras, et all 7
Tsiatouhas,Y. 8

V

Varotsos, et all 3, 7, 15
Vasileiadis, et all 16
Volos, et all 6, 14

W

Wout,J. 10

Z

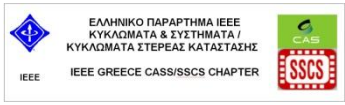
Zaidi, et all 3
Zalidis,G.C. 12
Zambrano-Serrano, et all 6, 14
Zervas,N. 18
Zhou, et all 8
Zigirkas,G. 19

Theon sensors

SÜDWESTMETALL

εκδόσεις
ΚΛΕΙΔΑΡΙΘΜΟΣ

Helic®



ΕΚΔΟΣΕΙΣ ΤΖΙΟΛΑ

AUTH e-LAB
Aristotle University of Thessaloniki-Electronics Laboratory

http://mocast.physics.auth.gr