

# ECCTD 2020



24<sup>th</sup> European Conference on Circuit Theory and Design, September 7-10, 2020

<http://ecctd2020.eu>

## Conference Program

	<b>Monday, 7<sup>th</sup></b>	<b>Tuesday, 8<sup>th</sup></b>	<b>Wednesday, 9<sup>th</sup></b>	<b>Thursday, 10<sup>th</sup></b>
<b>10:00-11:00</b>		<b>Keynote Lecture 2</b>	<b>Keynote Lecture 3</b>	
<b>11:00-12:00</b>		<b>RS1 (onsite)</b>	<b>SS1 (online)</b>	<b>RS5 (online)</b>
		<b>Break</b>	<b>Break</b>	<b>Break</b>
<b>14:00-15:00</b>		<b>SS2 (online)</b>	<b>RS3 (online)</b>	<b>RS6 (online)</b>
<b>15:00-16:00</b>		<b>SS2 (online)</b>	<b>SS1 (online)</b>	<b>RS6 (online)</b>
<b>16:00-17:00</b>		<b>RS2 (online)</b>	<b>RS4 (online)</b>	<b>RS7 (online)</b>
<b>17:00-18:00</b>		<b>SS2 (online)</b>	<b>RS4 (online)</b>	
<b>18:00-18:30</b>	<b>Opening</b>	<b>SS2 (online)</b>		
<b>18:30-20:30</b>	<b>Keynote Lecture 1</b>			
<b>20:30</b>	<b>Welcome party</b>		<b>Conference Dinner</b>	

**Keynote Speakers:**

**Opening Keynote lecture:**

**Edge of Chaos : The *Elan Vital* of Complex Phenomena**

by **Leon Chua**, *University of Berkley, USA*

**Date:** Monday, September 7

**Time:** 18:30-20:30

**Keynote lecture:**

**Future digitalization based on the dynamics of mem-computing systems**

by **Ronald Tetzlaff**, *TU Dresden, Germany*

**Date:** Tuesday, September 8

**Time:** 10:00-11:00

**Keynote lecture:**

**From CMOS to Memristor Nanoelectronics: Search for Best Design Threading**

by **Sung-Mo “Steve” Kang**, *University of California, Santa Cruz, USA*,  
and **Jason K. Eshraghian**, *University of Michigan, Ann Arbor, USA*

**Date:** Wednesday, September 9

**Time:** 10:00-11:00

**Special Session 1 (SS1): Physically Unclonable Functions**

**Chairs:** Miguel Garcia-Bosque and Carlos Sánchez-Azqueta

**Date:** Wednesday, September 9

**Time:** 11:00-12:00

**Miguel Garcia-Bosque, Guillermo Diez-Señorans, Carlos Sánchez-Azqueta, Santiago Celma,** *Introduction to Physically Unclonable Functions: Properties and Applications*

**Michael Pehl, Tobias Tretschok, Daniel Becker, Vincent Immler,** *Spatial Context Tree Weighting for Physical Unclonable Functions*

**Basel Halak, Callum Aitchison, Roman Buckle, Alvin Ch'Ng, Christian Clarke, Jacob Malley,** *On the Integration of Physically Unclonable Functions into ARM TrustZone Security Technology*

**Tolga Arul, Nikolaos Athanasios Anagnostopoulos, Sergej Reißig, Stefan Katzenbeisser,** *A Study of the Spatial Auto-Correlation of Memory-Based Physical Unclonable Functions*

**Alexander Schaub, Jean-Luc Danger, Olivier Rioul, Sylvain Guilley,** *The Big Picture of Delay-PUF Dependability*

**Date:** Wednesday, September 9

**Time:** 15:00-16:00

**Guillermo Diez-Senorans, Miguel Garcia-Bosque, Carlos Sanchez-Azqueta, Santiago Celma,** *A New Approach to Analysis the Security of Compensated Measuring PUFs*

**Cristina Martínez-Gómez, Iluminada Baturone,** *Calibration of Ring Oscillator PUF and TRNG*

**Tommaso Addabbo, Ada Fort, Riccardo Moretti, Marco Mugnaini, Hadis Takaloo, Valerio Vignoli,** *Design of Area-Efficient Physical Unclonable Functions Derived From CNNs: Trade-Offs and Optimization*

**Lilian Bossuet**, *Physical Security of Ring-based PUF*

**Special Session 2 (SS2): Sensing and Unconventional Mem-Processing with Multi-Functional Memristors**

**Chairs:** A. Ascoli, G.Ch. Sirakoulis, and. R. Tetzlaff

**Date:** Tuesday, September 8

**Time:** 14:00-16:00

**Mauro Di Marco, Mauro Forti, Giacomo Innocenti, Alberto Tesi**, *Input design for controlling dynamics in a second-order memristive circuit*

**Loai Danial, Shahar Kvatinsky**, *Breaking the Conversion Wall in Mixed-Signal Systems Using Neuromorphic Data Converters*

**Camilla La Torre, Andreas Kindsmüller, Seokki Son, Rainer Waser, Vikas Rana, Stephan Menzel**, *A Compact Model for the Electroforming Process of Memristive Devices*

**András Fülöp, András Horváth**, *Template Optimization in Cellular Neural Networks Using Gradient Based Approaches*

**Oscar Camps, Stavros Stavrinos, Rodrigo Picos**, *Efficient Implementation of Memristor Cellular Nonlinear Networks using Stochastic Computing*

**Alon Ascoli, Ioannis Messaris, Ahmet Samil Demirkol, Ronald Tetzlaff, Leon Chua, Dalibor Bielek, Viera Biolkova, Zdenek Kolka**, *Implementation of Logical and Memory Functions with Memristor Cellular Nonlinear Networks*

**Iosif-Angelos Fyrigos, Vasileios G. Ntinis, Michail-Antisthenis I. Tsompanas, Stavros Kitsios, Georgios Ch. Sirakoulis, Dimitrios Tsoukalas, Andy Adamatzky**, *Implementation and Optimization of Chemical Logic Gates using Memristive Cellular Automata*

**Vladimir Rakitin, Sergey Rusakov**, *Memristor based oscillators with controlled threshold parameters*

**Date:** Tuesday, September 8

**Time:** 17:00-18:30

**Dietmar Fey, John Reuben,** *Direct state transfer in MLC based memristive ReRAM devices for ternary computing*

**Vasileios G. Ntinis, Panagiotis Karakolis, Panagiotis Dimitrakis, Georgios Ch. Sirakoulis,** *Neuromorphic circuits on segmented crossbar 1D1M architectures with enhanced properties*

**Robinson De La Fuente, Ioannis Vourkas, Marcelo Perez,** *On the Development of MCU-based ad hoc HW Interface Circuitry for Memristor Characterization*

**Maide Bucolo, Arturo Buscarino, Luigi Fortuna, Salvina Gagliano, Giovanna Stella,** *Microfluidic sensors based on memristive circuits synchronization*

**Ayoub Jaafar, Alex Gee, Abdullah O. Hamza, Charlotte Eling, Jean-Sebastien Bouillard, Ali Adawi, Neil Kemp,** *Evidence of Nanoparticle Migration in Polymeric Hybrid Memristor Devices*

**Angela Slavova,** *Dynamics of a New Hysteresis Memristor CNN*

### **Regular Session 1 (RS1)**

**Date:** Tuesday, September 8

**Time:** 11:00-12:00

**Yahya Moshaei Nezhad , Juliane Müller, Christian Schnabel, Matthias Kirsch, Ronald Tetzlaff,** *A New CNN Occlusion Masking Method for IRT Imaging in Neurosurgery*

**Rabia Fatima Riaz, Dimitrios Prousalis, Christian Hoyer, Jens Wagner, Frank Ellinger, Frank Jülicher, Lucas Wetzel ,** *Stability and Transient Dynamics of PLLs in Theory and Experiments*

**Grigor Gatchev, Valentin Mollov**, *Integer Convolutional Neural Networks with Boolean Activations: The BoolHash Algorithm*

**Krassimir Atanasov, Sotir Sotirov**, *Multilayer perceptron representation by index matrices with elements in a fixed interval*

## **Regular Session 2 (RS2)**

**Date:** Tuesday, September 8

**Time:** 16:00-17:00

**Pier Paolo Civaleri, Fernando Corinto**, *Equivalent Transmission Lines for Quantum Particles in Sectionally Constant Potentials*

**Veselin Manev, Marios Neofytou, Georgi Radulov, Kostas Doris**, *A novel analysis of the beam squinting in wideband phased array digital I/Q transmitters*

**Gordana Jovanovic Dolecek**, *Improving Aliasing Rejection by Inserting Additional Zeros into Folding Bands Using Simple Filters*

**Tuğberk Oğulcan Çakıcı, Gamze İslamoğlu, Seyda Nur Guzelhan, Engin Afacan, Gunhan Dunder**, *Improving POF Quality in Multi Objective Optimization of Analog ICs via Deep Learning*

## **Regular Session 3 (RS3)**

**Date:** Wednesday, September 9

**Time:** 14:00-15:00

**Lukas Zimmermann, Alexander Scholz, Mehdi B. Tahoori, Axel Sikora, Jasmin Aghassi-Hagmann**, *Hardware-Intrinsic Security with Printed Electronics for Identification of IoE Devices*

**Tilman Horst, Robert Fischbach, Jens Lienig**, *A Globally-optimized Co-design Approach for Heterogeneous Systems Using Convex Optimization*

**Lorenzo Benvenuti, Paolo Bruschi, Luca Fanucci, Alberto Maccioni, Giuseppe Pasetti, Francesco Tinfena,** *A startup circuit for even-stage differential ring oscillators*

**Georgios-Panagiotis Kousiopoulos, Spyridon Nikolaidis,** *Fast leak localization based on acoustic signal attenuation for pipelines in high-noise environment*

#### **Regular Session 4 (RS4)**

**Date:** Wednesday, September 9

**Time:** 16:00-18:00

**Eugene Koskin, Maksim Balakin, Nikita Ryskin, Dimitri Galayko, Elena Blokhina,** *Synchronisation in noisy PLL Networks. Time Domain Model and its analysis*

**Eugene Koskin, Pierre Bisioux, Dimitri Galayko, Elena Blokhina,** *FPGA Validation of Event-Driven ADPLL*

**Ersin Alaybeyoğlu, Hakan Kuntman,** *On the Performance Improvement of OTA in Sub-Threshold Region with Dual Supply*

**Wan-Ling Wu, Ching-Yuan Yang, Dung-An Wang,** *An Flipping Active-Diode Rectifier for Piezoelectric-Vibration Energy-Harvesting*

**Vassilis Alimisis, Marios Gourdouparis, Christos Dimas, Paul Sotiriadis,** *Implementation of Fractional-order Model of Nickel-Cadmium Cell using Current Feedback Operational Amplifiers*

**Christos Dimas, Vassilis Alimisis, Paul Sotiriadis,** *SPICE and MATLAB simulation and evaluation of Electrical Impedance Tomography readout chain using phantom equivalents*

**Marko Pakaslahti, Jan Nissinen, Ilkka Nissinen,** *A Pulse Width-Controlled CMOS Laser Diode Pulser and a Time-Gated Time-Resolved SPAD Array Transceiver Chip for Diffuse Optics*

**Georgi Radulov, Patrick Quinn,** *A 0.037mm<sup>2</sup> 1GSps 12b self-calibrated 40nm CMOS DAC cell with SFDR > 60dB up to 200MHz and IM3 <-60dB up to 350MHz*

### **Regular Session 5 (RS5)**

**Date:** Thursday, September 10

**Time:** 11:00-12:00

**Srisubha Kalanadhabhatta, Kiran Kumar Anumandla, Saqib Khursheed, Amit Acharyya,** *Secure Scan Design with a Novel Methodology of Scan Camouflaging*

**Anna Bugakova, Nikolay Prokopenko, Alexey Titov,** *Design of Low-Temperature and Radiation-Hardened JFET Op-Amps without Current Mirrors*

**Canberk Topal, Elif Nur İşman, Latif Akcay, Berna Ors,** *Instruction Extension of an Open Source RV32IMC Core for NTRU Cryptosystem*

**Stijn Ringeling, Loek Steinebach, Qilong Liu, Chenming Zhang, Shagun Bajoria, Muhammed Bolatkale, Lucien Breems, Georgi Radulov,** *Novel Baseband Analog Beamforming through Resistive DACs and Sigma Delta Modulators*

### **Regular Session 6 (RS6)**

**Date:** Thursday, September 10

**Time:** 14:00-16:00

**Radu Matei,** *Closed-Form Design of 2D Filters with Elliptical and Circular Frequency Response*

**Rashi Dutt, Amit Acharyya,** *A High Speed and Low Complexity Architecture Design Methodology for Square Root Unscented Kalman Filter based SLAM*



**Amlan Nag, Ravinder Dahiya, Srinjoy Mitra**, *A Low-Power Wide Supply Range Delay-Line Based IC for Bidirectional Amperometric Measurement*

**Sergey Rusakov, Mark Gourary**, *Simulation Tool for Analysis of Oscillator Ensembles Defined by Kuramoto Model*

**Takahide Sato, Shintaro Motoki, Satomi Ogawa**, *Time-division chopper amplifier suitable for acquisition of plural biological signals*

**Achilles Boursianis, Maria Papadopoulou, Spyridon Nikolaidis, Sotirios Goudos**, *Dual-Band Single-Layered Modified E-shaped Patch Antenna for RF Energy Harvesting Systems*

**Antonio Dionisio Martínez-Pérez, Pedro A. Martínez-Martínez, Guillermo Rollo, Francisco Aznar, Santiago Celma**, *A New Approach to the Design of CMOS Inductorless Common-gate Low-noise Amplifiers*

### **Regular Session 7 (RS7)**

**Date:** Thursday, September 10

**Time:** 16:00-17:00

**Pierre Bisiaux, Elena Blokhina, Eugene Koskin, Teerachot Siriburanon, Dimitri Galayko**, *Design of a 1.5 GHz Low jitter DCO Ring in 28 nm CMOS Process*

**David Lauder, Yichuang Sun**, *An Overview of Automatic Antenna Impedance Matching for Mobile Communications*

**David Lauder, Yichuang Sun**, *Design Considerations of Antennas and Adaptive Impedance Matching Networks for RF Energy Harvesting*

**Radu Matei**, *Wedge Filters Designed From 1D Digital Prototypes*

**Maximilian Neuner, Helmut Graeb**, *Synergetic Algorithm for Power-Down Synthesis*

