MOCAST

International Conference on
Modern Circuits and Systems Technologies

Agenda

11 - 13 June 2025 in Dresden, Germany

Wednesday, June 11

8:30-9:00 — Registration & Welcome Address (FOE/244)

9:00-10:00 — Keynote 1:
Innovations across AI and Semiconductors
Themis Prodromakis
Chair: Ronald Tetzlaff Room: FOE/244

10:00-10:30 — Coffee break

	RS1: Analog/RF and Mixed Signal Circuits Chairs: Georgios Panagopoulos / Maria Papadopoulou Room: FOE/244	RS2: Sensors and Systems Chair: Richard Schroedter / Carsten Knoll Room: FOE/101
10:30-10:48	**Eleftherios Sarris** Monolithic Integrated GaN Circuit for Temperature Compensated Biasing	**Dmitry Baimel** Implementation of Novel Multi-Step Bridge Fault Current Limiter for Transient Stability Enhancement of DFIG-Based Wind Turbines
10:48-11:06	**Savvas Karipidis** Design Cycle Speed up of Product Level Voltage References	**Mohammed Hassan Arif** Direction of Arrival Estimation Using Compressive Sensing and Green's Function Interpretation for a Frequency-Diverse Metasurface
11:06-11:24	**Vassilis Alimisis** A Cuff-Less Blood Pressure Estimation System Based On Low-Power Analog Integrated Neural Network	**Dimitrios Brodimas** Federated Learning for Workload Forecasting for Network Service Management
11:24-11:42	**Vasileios Moustakas** A Low-Power Analog Integrated Decision Tree for Diabetic Retinopathy Detection	**Stylianos A. Mytilinaios** Victim Detection Using a Robot-Mounted UWB-Radar Platform
11:42-12:00	**Mohamed Watfa** Low-Rank Equilibrium Propagation: an on-line Incremental Learning Architecture for analog-based Hardware-Accelerators	**Phuc Truong Loc Nguyen** Sparse-KSVD for Blind Decomposition on Task-Related fMRI Data: A Comparative Analysis with ICA and MCA-KSVD
12:00-12:18	**Lukas Hüssen** Power Amplifier Design With 8 dBm Saturated Output Power in D-band In 22-nm FDSOI Technology	**Stylianos A. Mytilinaios** A radar-based berthing-aid system (R-BAS)
12:18-12:36	**Georgios Panagopoulos** A 28 GHz Low-Phase Noise QVCO in 22nm FD-SOI using Back-Gate Coupling	

12:36-13:30 — Lunch

13:30-14:30 — Keynote 2:
Big AI for Small Devices
Hai (Helen) Li
Chair: Spiros Nikolaidis Room: FOE/244

14:30-14:45 — Coffee break

14:45-16:00 — **Poster Session**
Location: Foyer in front of FOE/244

	SpS1: Emerging Memory Devices for In-Memory AI: From Materials to System Integration Chairs: Thomas Kämpfe / Alptekin Vardar Room: FOE/244	RS3: Device and Circuit Modeling Chairs: Ioannis Messaris / Dimitris Prousalis Room: FOE/101
16:00-16:18	**Deianira Fejzaj** A Vertical Memristive MoS2-exfoliated Device for Applications in Artificial Synapses	**Lijie Xie** Empirical Programming Protocol and Monitor-Free Multi-Level Modulation for Memristors
16:18-16:36	**Chong Peng** Nucleation-limited-switching based compact models for Hf-based ferroelectric devices and their applications in memory arrays	**Juan Martinez** Verilog-A look-up table model of a TIG-RFET compatible with 22 nm FDSOI design rules Satisfying Gummel Symmetry
16:36-16:54	**Alptekin Vardar** People Counting and Positioning Using Low-Resolution Infrared Images for Resource-Constrained Edge Inference	**Sahitya Yarragolla** Coexistence of resistive capacitive and virtual Inductive effects in memristive devices
16:54-17:12	**Xinpeng Jiang** Thermal-Compensated MRAM Sensing: Dynamic TMR Stabilization Across Wide Temperature Range	**Emmanouil Stavroulakis** RRAM-based Hardware Implementation Of P Systems
17:12-17:30	**Nelli Laleni** Integrating P-bits in MTJs: A Bridge to Efficient Stochastic Computing	**Carsten Knoll** Towards Formal Representation of Memristor-Related Domain Knowledge – A Pragmatic Attempt

18:00-21:00 — **Welcome Reception**
Location: FOE-Courtyard

Thursday, June 12

8:30-9:00 — Registration

9:00-10:00 — Keynote 3:
ESMC – a light house project of the European chips act in Silicon Saxony
Christian Koitzsch
Chair: Ronald Tetzlaff Room: FOE/244

10:00-10:30 — Coffee break

	SpS2: Trends in Modern Computer Arithmetic and Digital Number Formats Chairs: Jochen Rust / Moritz Bärthel Room: FOE/244	SpS3: Advances in Memristive Neuromorphic Devices and Circuits for Artificial Intelligence and Edge Computing Chairs: Alon Ascoli / Ahmet Samil Demirkol Room: FOE/101
10:30-10:48	**Martin Kumm & Florent de Dinechin** Application-specific Arithmetic (Invited Talk)	**Valeri Mladenov** Memristor-Based Logic Gates and Circuits For Artificial Intelligence
10:48-11:06		**Richard Schroedter** Model-based write algorithm for Memristive crossbar arrays
11:06-11:24	**Akash Kumar** Approximate Arithmetic Circuits Enabling Energy-efficient Edge Computing	**Valeri Mladenov** A Simple Analog Neuron with Memristor Based Synapses and SATLINS Transfer function
11:24-11:42	**Laslo Hunhold** Streamlining SIMD ISA Extensions with Takum Arithmetic: A Case Study on Intel AVX10.2	**Kapil Bhardwaj** Preventing False Activations in Autonomous Vehicles: A Memristive Associative Learning Approach with Selective Sensor Pairing
11:42-12:00	**Moritz Bärthel** A Formal Evaluation of the Design Space for SORN Arithmetic Datatypes	**Pushkar Srivastava** 2-MOSFET Dynamic Threshold-Based Reversible & Bipolar Unbiased Inverse-Memristor Emulator
12:00-12:18	**Nils Hülsmeier** Multiplier-Free Neural Networks: An Exploration of SORN-based Neural Networks on Hardware	**Alon Ascoli** NDR Effects in a Locally-Active Memristor Induce Small-Signal Amplification in a Simple Cell
12:18-12:36	**Jochen Rust** SORN-based Cross-Correlation for SCG Signal Peak Detection in Resource-Constrained Systems	

12:36-14:00 — Lunch

14:00-15:00 — Keynote 4:
Diffusive and drift memristors for neuromorphic and analog computing
J. Joshua Yang
Chair: Alon Ascoli Room: FOE/244

15:00-15:25 — Coffee break

15:25-15:30 — **Group picture**
Location: Inner courtyard of Fritz-Förster-Bau

15:30-16:00 — **Industry Session: Impulse Talk**
Jürgen Daleiden
Room: FOE/244

16:00-17:00 — **Round Table Discussion**
Chair: Ronald Tetzlaff Room: FOE/244

19:00-23:00 — **Gala Dinner**
Location: Anna at Residence Castle Dresden

Friday, June 13

8:30-9:00 — Registration

9:00-10:00 — Keynote 5:
AI chips. How about safety and security?
Jaan Raik
Chair: Spiros Nikolaidis Room: FOE/244

10:00-10:30 — Coffee break

	RS4: Artificial Intelligence, Machine learning and their Applications Chairs: Vasileios Ntinas Room: FOE/244	RS5: Nonlinear Circuits and Systems Chairs: Ahmet Samil Demirkol / Dimitris Prousalis Room: FOE/101
10:30-10:48	**Ioannis Kafetzis** Efficient Selection of Rare Pathology Samples from Unlabeled Medical Data Via Deep Active Learning	**Wojciech Korneta** Quantitative description of the stochastic resonance in Chua circuit using the DFT of switch-phase difference distribution
10:48-11:06	**Eleni Tselepi** Early-Stage Prediction of Electromigration Stress Using Extreme Gradient Boosting Algorithm	**Lamberto Carnazza** A New Analog Circuit Implementation Of the Izhikevich Neuron
11:06-11:24	**Athanasios Delis** Low Cost Platelet-Rich Plasma Facilities Creation with AI-Driven Cardiovascular Disease Assessment Using Raman Spectroscopy	**Eduardo Elpidio Rodriguez** Complex Dynamics and Implementation of Neuron Models Coupled Via Second Order Memristor
11:24-11:42	**Vijay Barethiye** PID-Controlled Active Half Car Suspension System with AI Based Shock Absorber	**Lazaros Moysis** Efficient Chaotic Image Encryption with Circular Shifting And Soboleva-Modulo Map
11:42-12:00	**Filip Ivanis** Towards a Soft Robotic Glove for Physical Rehabilitation Featuring Adjustable Agonist/Antagonist Muscle Support	**Jinming Sun** Spectrum: A holistic evaluation framework for nonlinear system modeling methods
12:00-12:18	**Athanasios Delis** Electrical Components Detection in Images with YOLO Model Architectures using Slicing-Aided Hyper Inference	**Lazaros Moysis** A Generalized Attention Deficit Disorder Chaotic Model With Soboleva Hyperbolic Tangent Functions
12:18-12:36	**Eleni Bougioukou** Efficient Deployment of CNN Models On multiple In-Memory Computing Units	**Alexandra Choumpaev** A Generalized Chaotic Neural Network Model for Epilepsy Using Soboleva Hyperbolic Tangent Functions

12:36-13:30 — Lunch

13:30-14:30 — Keynote 6:
In-Memory Sensing by Switching Devices
Sandro Carrara
Chair: Jens Trommer Room: FOE/244

14:30-14:45 — Coffee break

	RS6: Digital Circuits and Systems Chairs: Alberto Garcia-Ortiz / Valeri Mladenov Room: FOE/244	SpS4: Advanced Technologies, Systems, and Applications for Expanding Wireless Communications Horizons Chairs: Achilles Boursianis / George Tsoulos Room: FOE/101
14:45-15:03	**Evangelia Konstantopoulou** Optimizing Lightweight Cryptographic Schemes for Enhanced Security in RFID and Wireless Sensor Networks	**Franz Alwin Dürrwald** Low-Loss GSG Bondwire Chip-to-Chip Interconnects from DC to 330 GHz
15:03-15:21	**Christodoulos Peltekis** Periodic Online Testing for Sparse Systolic Tensor Arrays	**Vasileios Tsoulos** Machine Learning-Based In-Car KPI Predictions for Cellular Networks
15:21-15:39	**Zeyu Huang** Research on the Simulation Acceleration Method of System-Level Single-Event Effects Based on Register Fault Injection	**Achilles Boursianis** ML methods for SNR Prediction in Vehicular Communications
15:39-15:57	**Shereef Helal** VUSA: Virtually Upscaled Systolic Array Architecture to Exploit Unstructured Sparsity in AI Acceleration	**Georgios Korompilis** Two-layered Ultra-Wideband and High Gain Metamaterial Antenna for 5G Ka-Band Applications Using the Mountain Gazelle Optimizer
16:00-16:15	**Wegdan Mohamed** Quantized Semantic Segmentation for Efficient Spectrum Sensing on FPGAs	**Giuseppe Grassi** Non-Volatile Memristor as a Backscattering Circuit Element: High-Frequency Analysis and Preliminary Theoretical Considerations
16:15-16:33	**Ioannis Sofianidis** Trade-offs in the Sleep Mode Management of the RP2040 Microcontroller	

16:33-17:00 — **Best Paper Award Ceremony / Outlook on MOCAST 2026 / Farewell**
Chair: Spiros Nikolaidis Room: FOE/244

CAS · IEEE · Technische Universität Dresden · Aristotle University of Thessaloniki · DFG Deutsche Forschungsgemeinschaft · SECAI · CMC Chua Memristor Center · GlobalFoundries · Infineon · esmc™