NEWCAS 2023 Session Details - Lectures

Monday, June 26

14:15 - 15:30

Young Professionals

Room: Duddingston

Session Chairs: Nazila Fough

9304	Extremely Random Forest Based Automatic Tonic-Clonic Seizure Detection Using Spectral Analysis on Electroencephalography Data	Nazila Fough
9306	Enhancing Real-World Inverted Pendulum Stabilization: Addressing External Perturbations with Feedback and Model Predictive Control	Josefredo Gadelha da Silva
9311	Decentralised Biomedical Signal Classification Using Early Exits	Xiaolin Li
9314	Leakage Power Attack and Half Select Issue Resilient Split 8T SRAM Cell	Syed Farah Naz
9316	Modular Processor Architecture with Cryptography ISA Extensions	Itamar Levi

Tuesday, June 27

8:30 - 9:45

Analog/Mixed-Signal Circuits 1

Room: Pentland East

Session Chair: Herve Barthelemy, Andrea Ballo

9026	A 10 Bit 6 GS/s Time-Interleaved SAR ADC with a Single Full-Rate Front-End Track-and-Hold	Sebastian Linnhoff
9056	A 2 GHz Bandwidth, 6-Bit Inverter-Based Open-Loop Amplifier for High-Speed ADCs	Pål Gunnar Hogganvik
9076	Heterogeneity in Time Delays Between Mutually Synchronized 24 GHz Oscillators	Christian Hoyer
9097	Gated Ring Oscillator Time Amplifier with Applications in Time Integration	Fei Yuan
9142	Performance and Stability Characterization of a 3rd Order Continuous-Time Delta-Sigma Modulator with Active Time-Constant Tuning	Tobias Wolfer

Analog/Mixed-Signal Circuits 2

Room: Holyrood

Session Chair: Yvon Savaria, Fei Yuan

9160	A 10-Bit 10 MS/s SAR ADC with Duty-Cycled Multiple Feedback Filter	Hanyue Li
9166	Time-Interpolated Vernier Digital-to-Time Converter with Applications in Time-Mode SAR TDC	Fei Yuan
9199	High-Swing, Power-Efficient, Current-Mode Hybrid Circuit Topologies for Simultaneous Bidirectional Communication	Prema Kumar Govindaswamy
9217	An Ultra-Wideband Amplifier with Compact Magnetically Coupled Feedback Gain Cell	Shulan Chen
9253	A Low-Voltage Submicrowatt, High-Speed CMOS Dynamic Comparator	Reza Papi

Communications Circuits & Systems

Room: Pentland West

Session Chair: Yushi Zhou, Kuang-Wei Cheng

9176	A Modular System-Level Testbench for 6G Beamforming Applications with Near Circuit-Level Fidelity	Rikard Gannedahl
9221	Analysis and Design of a 7 Gb/s Rotatable Non-Contact Connector with Grid Array Package Application	Ximing Wang
9227	A 433MHz Multi-Mode Wake-Up Receiver Achieving High Sensitivity via Balun LNA and Injection Locked Oscillator	Pin-Chen Yeh
9244	100GBit/s RF Sample Offload for RFSoC Using GNU Radio and PYNQ	Marius Siauciulis

Digital Circuits & Systems

Room: Duddingston

Session Chair: Jean Pierre David, Yves Blaquiere

9038	Correcting ADC Jitter Using DPLL Timing Error Signal	Haoyang Shen
9103	Error Analysis for Fused Floating-Point Square-Root and Division Based on Goldschmidt Algorithm	Liangtao Dai
9138	High-Resolution Fractional Digital Frequency Divider Using a Binary-Rate Multiplier	Denis Flores

RF & Microwave Circuits

Room: Salisbury

Session Chair: Jean-Baptiste Begueret, Nathalie Deltimple

9037	Pixelated RF: Random Metasurface Based Electromagnetic Filters	Jeffrey Sean Walling
9058	Design and Experimental Evaluation of 60 GHz Self-Compensating Bond-Wire Interconnect	Rabia Fatima Riaz
9061	Substrate Noise Mitigation Using High Resistivity Base Silicon Wafer for a 14 GHz VCO on 28 nm FD-SOI	Youssef Bendou
9109	A 2.45GHz SiGe Power Amplifier with a Novel Digital Predistortion Using Orthogonal Sequences	Antoine Lhomel
9191	Broadband RF Front-End Featuring a Reconfigurable Q-Enhanced Filter for Upper Mid-Band 6G Receivers	Iman Ghotbi

15:00 - 16:30

SPECIAL SESSION: Emerging Tech & Security

Room: Salisbury

Session Chair: Markus Fritscher

9050	Automated Information Flow Analysis for Integrated Computing-in-Memory Modules	Felix Staudigl
9111	Evaluation of Secure Circuit Styles Using Unipolar Logic Gates	Jelle Biesmans
9120	Gate Camouflaging Using Reconfigurable ISFET-Based Threshold Voltage Defined Logic	Elmira Moussavi
9206	Integrated Architecture for Neural Networks and Security Primitives Using RRAM Crossbar	Simranjeet Singh

SPECIAL SESSION: Emerging Technologies for Carbon Neutral Computations

Room: Duddingston

Session Chair: Renyuan Zhang

9040	Sensitivity Analysis of Memory Bandwidth on Column-Superposed Versatile Linear CGRA	Tomoya Akabe
9046	Design and Implementation of an FFT-Based Neural Network Accelerator Using Rapid Single-Flux-Quantum Technology	Olivia Chen
9112	An Ultra-Compact Calculation Unit with Temporal-Spatial Re-Configurability	Yirong Kan

SPECIAL SESSION: Emerging technologies for Implantable Healthcare Devices

Room: Holyrood

Session Chair: Benoit Gosselin, Finlay Walton

9179	A 1,224-Channel 60 µm Pitch Active Closed-Loop Stimulator for Selective Retinal Ganglion Cell Type Activation	Philipp Löhler
9215	Highly Integrated and Ultra-Compact Rectenna with Wireless Powering for Implantable Vascular Devices	Jungang Zhang
9216	Fiber-Bragg-Grating Coupled Magnetostrictive Sensors for Magnetic Tracking of Biomedical Implants	Mahdieh Shojaei Baghini
9245	A Feasibility Study on Textile Electrodes for Transcutaneous Electrical Nerve Stimulation	Wei Ju
9260	A Multi-Modal Stimulator System for Visual Prosthesis	Emad A. Abdo

SPECIAL SESSION: In-Memory/Near-Memory Computing 1

Room: Pentland West

Session Chair: Farhad Merchant

9034	Accelerating Relational Database Analytical Processing with Bulk-Bitwise Processing-in-Memory	Ben Perach
9039	Verification of in-Memory Logic Design Using ReRAM Crossbars	Kamalika Datta
9064	Frequency and Noise Characterization for Baseband Signal Processing on Neuromorphic Circuits	Melvin Galicia Cota
9082	Optoelectronic Memristor Model for Optical Synaptic Circuit of Spiking Neural Networks	Jiawei Xu

SPECIAL SESSION: In-Memory/Near-Memory Computing 2

Room: Pentland East

Session Chair: Jeffrey Walling

9137	Finite State Automata Design Using 1T1R ReRAM Crossbar	Simranjeet Singh
9110	One-Transistor-Multiple-RRAM Cells for Energy-Efficient in-Memory Computing	Uhlmann, Max
9203	Benchmarking Multiplier Architectures for MAGIC Based in-Memory Computing	Chandan Kumar Jha
9232	Technology-Aware Drift Resilience Analysis of RRAM Crossbar Array Configurations	Daniel Reiser

Wednesday, June 28

9:00 - 10:30

Analog/Mixed-Signal Circuits 3

Room: Pentland East

Session Chair: Carlos Galup-Montoro, Daniel Massicotte

9292	A New Current-Mode Subthreshold, High-PSRR MOSFET-Only Bandgap Voltage Reference	Reza Papi
9293	A Sub-mW Ultra-Low Power Low-Voltage LED Driver for a Patch Pulse Oximetry	Reza Papi
9006	Analog Baseband Circuits for Low-Power 802-11ba Wake-Up Radio in 40-nm CMOS	Francesco Frattini
9025	NB-IoT Wideband Power Amplifier and Diode-Based Antenna Switch co-Integration in 130 nm CMOS SOI	Tristan Iecocq
9048	A Time-Domain Charge-Balancing Method for Neuromodulators	Stefan Reich

Biomedical Circuits & Systems

Room: Salisbury

Session Chair: Richard George, Gosselin Benoit

9049	A 16-Channel Real-Time Adaptive Neural Signal Compression Engine in 22nm FDSOI	Liyuan Guo
9052	A Flexible Power Management System-on-Chip for Implantable Brain-Machine-Interfaces	Stefan Reich
9214	An Autonomous Zero-Mask Unique ID Generation System for Next-Generation Neural Interfaces	Berkay Ozbek

Circuits & Systems for AI Algorithms

Room: Duddingston

Session Chair: Lior Bar Lev, Shady Agwa

9057	Bent-Pyramid: Towards a Quasi-Stochastic Data Representation for AI Hardware	Shady Agwa
9136	Low-Power Event-Driven Spectrogram Extractor for Multiple Keyword Spotting : A Proof of Concept	Soufiane Mourrane
9193	Sparq: A Custom RISC-V Vector Processor for Efficient Sub-Byte Quantized Inference	Théo Dupuis
9230	Streaming Convolutional Neural Network FPGA Architecture for RFSoC Data Converters	Andrew MacLellan
9235	Iterative Pruning Algorithm for Efficient Look-Up Table Implementation of Binary Neural Networks	Amirali Ebrahimi

Neural Networks & Neuromorphic Circuits

Room: Pentland West

Session Chair: Otmane Ait Mohamed

9010	Wave Digital Emulation of a Light-Modulated Central Pattern Generator	Sebastian Jenderny
9016	A Reservoir Computer-Based Modeling of Hunting Dynamics in Predator-Prey Scenarios	Sebastian Jenderny
9018	A Simplified Hindmarsh-Rose Model Based on Power-Flow Analysis	Sebastian Jenderny

9:00 - 10:45

Virtual Session 1

Room: Holyrood

Chair: Callum Geldard

Track: SPECIAL SESSION: Emerging Tech & Security

9154	Overview of Memristive Cryptography	Ilia Polian
9157	Formal Analysis of Camouflaged Reconfigurable Circuits	Michael Raitza

Track: SPECIAL SESSION: Emerging Technologies for Carbon Neutral Computations

9084	Integrated Beamforming and Resource Allocation in RIS-Assisted mmWave Networks Based on Deep Reinforcement Learning	Hui Gao
9105	Training Low-Latency Spiking Neural Network with Orthogonal Spiking Neurons	Man Wu

Track: Neural Networks & Neuromorphic Circuits

9268	A Shared Synapse Architecture for All-Optical Spiking Neural Networks	Milad Eslaminia
9220	A Current-Mode Implementation of a Nearest Neighbor STDP Synapse	Akwasi Darkwah Akwaboah

13:30 - 14:45

Analog/Mixed-Signal Circuits 4

Room: Duddingston

Session Chair: Tsung-Heng Tsai, Kan Yirong

9089	A 8.34 nW Wake-Up Receiver Achieving -50dBm Sensitivity at 2.4GHz	Sebastien Guigue
9122	A Sub-Picosecond Resolution Jitter Instrument for GHz Frequencies Based on a Sub-Sampling TDA	Ankush Mamgain
9162	Low-Power Single-Slope ADC with a Replica Comparator for Always-on Cis Applications	Hohyeon Lee
9242	A 5-DC-Parameter MOSFET Model for Circuit Simulation in QucsStudio and Spectre	Carlos Galup Montoro
9279	A Dual-Output Picowatt Hybrid Voltage Reference with Digital Trimming Technique	Yilun Jin

Emerging Technologies & Technology Trends

Room: Pentland West

Session Chair: Hadi Heidari, Eckhard Hennig

9126	A Memristor-Based Tuneable Offset Comparator	Sachin Maheshwari
9133	Single Transistor Analog Building Blocks: Exploiting Back-Bias Reconfigurable Devices	Niladri Bhattacharjee
9134	Design of a Current Sense Amplifier with Dynamic Reference for Reliable Resistive Memory	An Byungkwon
9204	A Method to Reduce the Design Complexity of Nanophotonic Interconnects	Shayan Zohrei
9239	Nano-Magnetic Logic Based Architecture for Edge Inference Using Tsetlin Machine	Kishore Chandrappa

Energy Harvesting & Power Management

Room: Pentland East

Session Chair: Sandy Cochran, Alfio Dario Grasso

9013	High-Speed All-GaN Gate Driver with Reduced Power Consumption	Katia Samperi
9036	An Energy-Efficient Design Strategy for Dickson Charge Pumps with Linear Distributed Capacitance	Andrea Ballo
9171	An Asynchronous Single-Inductor Multi-Input Multi-Output DC-DC Converter for Ambient Energy Harvesting with 94.8% Peak Efficiency	Mingyi Chen
9252	Battery-Free Bluetooth Low Energy Wireless Sensor Powered by Radiative Wireless Power Transfer	Alexandru Takacs

Sensory Circuits & Systems

Room: Holyrood

Session Chair: Maryam Shojaei Baghini, Salvatore Pennisi

9127	An Integrated Analog Lock-In Amplifier Using a Passive 3-Path Band-Pass Filter for a Fluxgate Sensor Readout Circuit	Maximilian Scherzer
9177	Localization of Miniature Ingestible Coils Using Tri-Polar Plane Type (TPT) Transmitter	Lichen Yao
9224	Phase Space Reconstruction Based Methodology for Real Time Impact Assessment of Corrosion on Structural Health of Ship Material Using In-Situ Acoustic Emission Sensors	Prasannata Bhange
9288	A High Dynamic-Range Readout Circuit with Differential Resistance-to-Time Conversion for Gas Sensor	Meng-Lin Tsai
9291	CMOS Temperature Sensor Utilizing Gate-Length-Based Threshold Voltage Modulation	Mahfuzul Islam

15:00 - 16:00

Virtual Session 2

Room: Holyrood

Chair: Callum Geldard

Track: Biomedical Circuits & Systems

9231	A Low-Noise CMOS Front-End with 534 MΩ Transimpedance Gain for Single-Molecule Signal Acquisition	Chenyu Ma

Track: Communications Circuits & Systems

9270	A Low Power Ultra-Wideband RF Receiver Front-End Using a Differential N-Path Notch Filter	Ali Poursaadati Zinjanab

Track: Digital Circuits & Systems

9209	Error Resilient Sleep Convention Logic Asynchronous Circuit Design	Mithun Datta
9233	Architectural Exploration for Energy-Efficient LMS and NLMS Adaptive Filters VLSI Design	Pedro Tauã Lopes Pereira