21st International Conference on IC Design and Technology (ICICDT) Marina Bay Sands, Singapore,

September 25 - 27, 2024

21st International Conference on IC Design and Technology (ICICDT 2024)

25-27 September 2024
Marina Bay Sands, Singapore
Level 3, Cassia Junior Ballroom

IEEE ICICDT 2024 Final Programme

Day 1 Tutorial (Wednesday, 25th September, 2024)	
Time\Venue	**Level 3, Cassia Junior Ballroom 3211-3212**
8:30-17:00	Registration (Cassia Ballroom 3211 Foyer)
Session Chairs	Stefano D'Amico (Ph. D) ; Dina Triyoso (Ph. D)
9:30-10:30	Tutorial 1: Luis ANDIA (Ph. D) *RF and mmWave Front-Ends Applications and Technologies Trends from Engineered Substrates to Systems*
10:30-11:00	Coffee/Tea Break (Ballroom 3311-3312)
11:00-12:00	Tutorial 2: Massimo ALIOTO (Ph. D) *Green Always-On Integrated Systems down to pWs from Little to No Batteries*
12:00-13:30	Lunch (Ballroom 3311-3312)
13:30-14:30	Tutorial 3: Kyongjun YOO (Ph. D) *Opportunities to overcome the challenges for prolongation of DRAM*
14:30-15:30	Tutorial 4: Tony Tae-Hyoung KIM (Ph. D) *Basics of Computing-in-memory: Analog vs Digital*
15:30-16:00	Coffee/Tea Break (Ballroom 3311-3312)
16:00-17:00	Tutorial 5: Wenke WEINREICH (Ph. D) *Microelectronics for Quantum Computing*
17:00-18:00	Tutorial 6: Yu CAO (Ph. D) *Device-Design Co-Engineering for Cryogenic Computing*
18:30-21:30	Welcome Reception (Bayview Foyer)
Day 2 (Thursday, 26th September, 2024)	
Time\Venue	**Level 3, Cassia Junior Ballroom 3211-3212**
8:30-17:00	Registration (Cassia Ballroom 3211 Foyer)
9:00-9:15	Opening & Welcome Address by Dr. Bich-Yen Nguyen
9:15-9:55	Keynote Speaker 1: Dong-Won KIM (Ph. D) *Fellow, Logic Technology Development, Semiconductor R&D Center, Device Solutions, Samsung Electronic*
9:55-10:25	Coffee/Tea Break (Ballroom 3311-3312)
10:25-11:05	Keynote Speaker 2: Chiao LIU (Ph. D) *Director of Research at Meta Reality Labs Research*
11:05-11:45	Keynote Speaker 3: Kiat Seng YEO (Ph. D) *Advisor (Global Partnerships) at Singapore University of Technology and Design (SUTD)*

11:45-12:05	Invited Speaker 01: René Jonker (M.Sc) *Empowering Tomorrow: Substrate Innovations for Cloud and Edge AI Solutions*	
12:05-12:25	Invited Speaker 02: Ahmedullah Aziz (Ph. D) *Synergistic Device and Circuit Design Using Volatile Memristors*	
12:25-14:10	Lunch (Ballroom 3311-3312) Poster Session (Bayview Foyer)	
14:10-14:30	Invited Speaker 03: Hussam Amrouch (Ph. D) *Brain-inspired In-memory Computing using Ferroelectic Transistors: Hope or Hype?*	
14:30-14:50	Invited Speaker 04: James Tandon (Ph. D) *A Survey of Approximate Computation Techniques in Machine Learning and Future Directions*	
14:50-15:10	Invited Speaker 05: Kai Ni (Ph. D) *Variation Tolerant Charge-Domain Compute-in-Memory with Ferroelectric Field Effect Transistor*	
15:10-15:30	Invited Speaker 06: Sanghyeon Kim (Ph. D) *Single crystalline semiconductor oscillator for Oscillator-based computing*	
15:30-16:20 (10 mins Interval)	ORAL1 Topic: **In-memory computing** Session Chairs: Chun Zhao (Ph. D) ; Wenyu Jiang (Ph.D)	
	167	An Energy-Efficient Low-Voltage SRAM-based Charge Recovery Logic Near-Memory-Computing Macro for Edge Computing
	156	Exploration of Synaptic Plasticity in Memristor based Wurtzite Ferroelectric Material
	118	Ultrafast self-rectifying memristors for advanced in-memory computing
	173	A Ferroelectric Reconfigurable Memory with Excitatory and Inhibitory Synaptic Responses
	140	A Novel Low-Energy Memristor with Coexisting Synaptic and Neuronal Behaviours
16:20-16:50	Coffee/Tea Break (Ballroom 3311-3312) Poster Session (Bayview Foyer)	
16:50-17:10	Invited Speaker 07: Kenneth E. Lee (Ph. D) *Monolithic CMOS + GaN Integrated Circuits Using CMOS Manufacturing Infrastructure*	
17:10-18:00	ORAL2 Topic: **Power management and energy harvesting** Session Chairs: Kian Ann Ng (Ph. D) ; Stefano D'Amico (Ph. D)	
	162	Managing Crosstalk in multi-GHz Front Side Clock for Back Side Power enabled Sub-2nm 2D/3D ICs
	163	A Transient-Enhanced Low-Dropout Regulator Design With Embedded Voltage Reference in 55-nm CMOS Technology
	180	Auto Power-SOI: Shaping the Future of Battery Monitoring Technology
	137	A Wide Input Range RF Energy Harvester With Low Leakage Current for Far-Field Wireless Power Transfer in 28nm CMOS Technology

	106	A 1MHz, 93.7% Peak Efficiency, Heterogenous GaN/BCD 48-to-3.3V~5V DC-DC Buck Converter
18:00-18:40 (10 mins Interval)	ORAL3 Topic: **SiC and GaN devices** Session Chairs: Liu Wen (Ph. D) ; Zhihong Liu (Ph. D)	
	166	Impact of Passivation on Thermal Stability of AlGaN/GaN HEMTs Under High-Temperature Annealing
	178	Au-free multi-layer Ti/Al Ohmic contacts for AlGaN/GaN HEMTs
	171	120 nm GaN HEMTs on a Si Substrate for Mm-Wave Mobile SoC Applications
	168	6-inch GaN-on-Si Fabrication Technolgies for Monolithic Microwave Integrated Circuits (MMICs)
19:00-21:30	Gala Dinner (Begonia Ballroom 3110-3011)	

Day 3 (Friday, 27th September, 2024)	
Time\Venue	**Level 3, Cassia Junior Ballroom 3211-3212**
8:30-17:00	Registration (Cassia Ballroom 3211 Foyer)
9:00-9:40	Keynote Speaker 4: Hanming WU (Ph. D) *Professor/Academician of the Chinese Academy of Engineering*
9:40-10:20	Keynote Speaker 5: Navab Singh (Ph. D) *Head of Technology Development at the Institute of Microelectronics, A*STAR, Singapore*
10:20-10:40	Coffee/Tea Break (Ballroom 3311-3312)
10:40-11:20	Keynote Speaker 6: Christopher NGUYEN (Ph. D) *Professor at HKUST, the CEO and Co-Founder of Aitomatic*
11:20-11:40	Invited Speaker 08: François Andrieu (Ph. D) *High density 3D NOR resistive memory technology for In Memory Computing*
11:40-12:00	Invited Speaker 09: Vita Hu (Ph. D) *Advancing 3D SRAM Cells with BEOL-Compatible Transistors*
12:00-12:20	Invited Speaker 10: Jun Luo (Ph. D) *Research on Advanced Structural Logic Transistors and Key Technologies*
12:20-12:40	Invited Speaker 11: Rui Zhang (Ph. D) *Ballistic Transport Behaviors in Ge pMOSFETs with Metal Source/Drain*
12:40-14:20	Lunch (Ballroom 3311-3312) Poster Session (Bayview Foyer)
14:20-14:40	Invited Speaker 12: Yida Li (Ph. D) *Oxide-based Devices for Memory Centric Computing in the Post Moore Era*
14:40-15:00	Invited Speaker 13: Chip Hong Chang (Ph. D) *Attacks on Edge Deep Neural Networks*
15:00-15:20	Invited Speaker 14: Yunkyung Kim (Ph. D) *Optimization of PDAF pixel for CMOS image sensors*

15:20-16:20 (10 mins Interval)	ORAL4 Topic: **Emerging memory technologies** Session Chairs: Tong Yi (Ph. D) ; Jiezhi Chen (Ph. D)	
	108	Investigating the Impact of 3D Trench Structures on the HfO2-Based Ferroelectric Capacitors
	149	Interface Engineering for Performance and Reliability Optimization of Hf0.5Zr0.5O2 FeFETs: Device Integration and Electrical Characterization
	153	A Comparative Study of Electrodes for Ferroelectric Capacitor Based Memory
	119	3D Phase Field Simulation and Variability Analysis of Polycrystalline Ferroelectric Memories
	174	Temperature Dependence in Coercive Field of Ferroelectric AlScN Integrated on Si Substrate
	120	NbOx Selector with TiOy Interlayer for Improved Performance Featuring On-Off ratio >500, Selectivity >500 and Switching Speed <70ns
16:20-16:50	Coffee/Tea Break (Ballroom 3311-3312) Poster Session (Bayview Foyer)	
16:50-1740 (10 mins Interval)	ORAL5 Topic: **Ultra-low power circuits** Session Chairs: Liter Siek (Ph. D) ; Wenyu Jiang (Ph. D)	
	131	An Ultra-Low Power CMOS Low Noise Amplifier Using Self-Forward Body Biasing for 2.4 GHz Wireless Communication
	157	A low-power SAR ADC with different weighted capacitor array by using merge and split switching technique
	114	A System-in-package for Smart Microphone with Ultra-low Power AI co-processor
	121	Behavioural Modelling of Fractional-N All Digital Phase-locked Loop For Low-Power Applications
	132	An Ultra-Low Power Low-IF BLE Receiver for IoT Applications
17:40-18:30 (10 mins Interval)	ORAL6 Topic: **IoT devices and circuits** Session Chairs: Wenke Weinreich (Ph. D) ; Xuanyao Fong (Ph. D)	
	144	Impact of Gate Structure on the Electrophysiology Detection Behaviors for SOI Ion-Sensitive FETs
	113	A 0.007 mm2, 0.1-4 GHz SDR RF Front-End for Wireless Sensor Networks in 65nm CMOS
	116	Memorable Logic Gate Based on Field Effect Oxide Resistive Switching Devices
	128	Enhanced External Quantum Efficiency in Silicon Avalanche Photodiode With Inverted Pyramidal Structure Surface Texturing
	129	Advanced FD-SOI engineered substrates for automotive radar applications
18:30-18:40	**Award/Closing** (**Ballroom 3211-3212**)	

Day 2 (Thursday, 26th September, 2024)	
Time\Venue	
12:25-14:10 Paper#	Poster Session (Bayview Foyer)
167	An Energy-Efficient Low-Voltage SRAM-based Charge Recovery Logic Near-Memory-Computing Macro for Edge Computing
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171	120 nm GaN HEMTs on a Si Substrate for Mm-Wave Mobile SoC Applications
168	6-inch GaN-on-Si Fabrication Technolgies for Monolithic Microwave Integrated Circuits (MMICs)
109	Enhanced FeFET Performance for Energy Efficient Neuromorphic Computing at Cryogenic Conditions
111	A Unified TRNG And PUF Module Based On Threshold Switching Array
112	Reversible transition of volatile to non-volatile resistive switching in Cu/SiNx/ZnO/Pt memristor
115	Optimization of Geometrical Parameters of Metal Plates for Isolation Capacitors
126	A Failure Analysis Framework For Ferroelectric Field-Effect Transistor Memory
127	Radiation Induced Degradation of Charge-trap (CT) 3D-NAND Flash Memory
141	One Ferroelectric Field-Effect Transistor and one Capacitor Ternary Content-Addressable Memory Based on Charge Domain Sensing Mechanism
142	Integration of Volume Change Liner Stressor on Ferroelectric Capacitors and FeFETs: Simulation and Electrical Characterization
148	Deep Insight of Self-heating Effect Induced Hot Carrier Reliability Improvement in LDMOS Devices

150	Revealing the Scattering Mechanisms of Mobility Degradation in Ultrathin Body SOI pMOSFETs
155	Why does AlScN appear to be the best choice for IIIA-VA-based wurtzite ferroelectrics?
169	Memcapacitor with High Switching Ratio and Tunable Synaptic Plasticity
172	What you need to know for growth of AlScN Thin Film via Atomic Layer Deposition?
181	CMOS Based Spiking-Time Dependent Plasticity Circuit and Simple Image Classification
143	Simulation and Analysis of GaN MIS-HEMT Based Optimized Bootstrap Comparator Applied to DC-DC Buck Converter Feedback Loop
Day 3 (Friday, 27th September, 2024)	
Time\Venue	
12:40-14:20 Paper#	Poster Session (Bayview Foyer)
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149	Interface Engineering for Performance and Reliability Optimization of Hf0.5Zr0.5O2 FeFETs: Device Integration and Electrical Characterization
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128	Enhanced External Quantum Efficiency in Silicon Avalanche Photodiode With Inverted Pyramidal Structure Surface Texturing
129	Advanced FD-SOI engineered substrates for automotive radar applications
101	A Low-Dropout Linear Regulator with Nested Miller Compensation in 65-nm SOI CMOS

105	A K-to-Ka Band Ultra Wideband Power Amplifier in 180-nm SiGe Technology
117	Study on Fast Reading Passive and Wireless Surface Acoustic Wave Torque Monitoring Sensor
123	Design of a General-Purpose, Compact, Operational Amplifier for Analog VLSI Cell Libraries
134	A 2.4 GHz High Efficiency Wideband Power Amplifier in 28-nm CMOS Process
135	A 2.4 GHz Fully Integrated Highly Linear Class E Power Amplifier in 28-nm CMOS
152	Design of a Broadband GaN-on-Si Monolithic Millimeter-Wave Transceiver Multi-Function Chip
154	Research on Switching Characteristics and Pulse Control of Wide Bandgap Semiconductor SiC-based Memristor
160	Substrate Coupling in SOI Technology: An Electromagnetic Study for RF Integrated Circuit Design & Manufacturing
165	Static characteristics and avalanche robustness of SiC MOSFET with P-well surface doping investigation
170	Low-Voltage Low-Power Scalable Voltage Reference
175	GaN Surface Acoustic Wave Resonaters on Si Substrate for RF Applications
176	Strong Polarization AlN/GaN/Si Heterojunction MIS-HEMT for Mm-Wave Low-Voltage Terminal Applications
177	Crosstalk reduction in a RGBW CFA image sensor
179	GaN-on-Si Solid-State Electronic Devices for Multipliers Applications

Program is subject to change.
Updated: 20th Sep 2024