

MEMRISYS 2021 Monday November 1, 2021 Day 1 (1/3)

Japan Time

8:30-8:40	Opening Remarks Masakazu Aono National Institute for Materials Science, Tsukuba, Japan					
8:45-9:30	Honorary Session, Chair: Masakazu Aono HS-1 "Why Brains Need Memristors Blessed with An Edge of Chaos Kernel?" Leon Chua University of California Berkeley, Berkeley, USA					
9:30-10:15	Plenary Session 1, Chair: Wei Lu PS-1 "Dynamically Active Memristors at the 'Edge of Chaos': pulse amplification, computation and data transmission" Richard Stanley Williams Texas A&M University, Texas, USA					
10:15-10:25	Break					
	Technical Session 1, Chair: Yiyang Li Keynote "Atomistic Simulations to Understand Microscopic Mechanism of Ion-Migration-based Resistive Switching Systems" Satoshi Watanabe The University of Tokyo, Tokyo, Japan			Technical Session 2, Chair: Akihito Sawa Keynote "Nanowire Networks for Neuromorphic Dynamics" Tomonobu Nakayama National Institute for Materials Science, Tsukuba, Japan		
10:25-10:50	1A-1	Invited "Exploring Novel Functions at Solid/solid Electrolyte Interfaces for Neuromorphic Applications" Takashi Tsuchiya National Institute for Materials Science, Tsukuba, Japan			Invited "Understanding the Interfaces of Solid Electrolytes and Electrodes for Memristive Devices" Taro Hitosugi Tokyo Institute of Technology, Tokyo, Japan	
11:15-11:30	1A-3	Construction of Neural Network Potential to Investigate Interface Structures of metal/Li ₃ PO ₄	Koji Shimizu	The University of Tokyo, Tokyo, Japan	1B-3	Demonstration of Memristor-based Spiking Neural Network
11:30-11:45	1A-4	Emulation of Synaptic Plasticity in Memristor Crossbar Arrays for Neuromorphic Applications	Haider Abbas	Hanyang University, Seoul, Republic of Korea	1B-4	Amorphous Metal-oxide Thin-film Memdevices and Integration to Neuromorphic Systems
11:45-11:55	Break					
	Technical Session 3, Chair: Qiangfei Xia			Technical Session 4, Chair: Munehiro Tada		
11:55-12:20	1A-5				1B-5	Invited "Investigation of Device Variation Impact and Complement Method for PCM-based Neuromorphic Computing" Akiyo Nomura IBM Research, Tokyo, Japan
12:20-12:45	1A-6	Invited "Leaky-integrator Neuron for Sporadic Spike Inputs" Isao H. Inoue National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan			1B-6	Invited "Power-free Synaptic Transistor" Teruo Kanki Osaka University, Osaka, Japan

MEMRISYS 2021 Monday November 1, 2021 Day 1 (2/3)

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Japan Time

Plenary Session 2, Chair: Paolo Milani		
18:20-19:05	PS-2	"Computational Phase-change Memory" Evangelos Elefteriou Axelera AI, Zurich, Switzerland

MEMRISYS 2021 Tuesday November 2, 2021 Day 2 (1/2)

Japan Time

7:00-7:30	International Steering Committee Meeting							
	Technical Session 9, Chair: Tomonobu Nakayama			Technical Session 10, Chair: Chair: Isao Inoue				
9:00-9:25	2A-1	Keynote "In-materio Computation" James K. Gimzewski University of California, Los Angeles, Los Angeles, USA			Keynote "Modular Memristive Crossbar Architectures and Dynamic Memristive Networks" Wei Lu University of Michigan, Ann Arbor, USA			
9:25-9:50	2A-2	Invited "Towards Physical Neuromorphic Device Consisting of Nanomaterials" Megumi Akai-Kasaya Osaka University, Osaka, Japan			Keynote "A Single Device Neuristor which Exhibits Neuronal Functionalities" Ivan Schuller University of California San Diego, San Diego, USA			
9:50-10:15	2A-3	Invited "In-Materio Computing Devices Consisted of Random Network Nanoparticles for Autonomous robotics" Hirofumi Tanaka Kyushu Institute of Technology, Fukuoka, Japan			Invited "Material Strategies for Memristor-based AI Hardware and Their Heterointegration" Jeehwan Kim Massachusetts Institute of Technology, Massachusetts, USA			
10:15-10:25	Break							
10:25-11:10	PS-3	Plenary Session 3, Chair: Tsuyoshi Hasegawa "Memristive Dynamics Enabled Hardware Elements and Circuits for Neuromorphic Computing" Ru Huang Peking University, Beijing, China						
11:10-11:20	Break							
	Technical Session 11, Chair: Masashi Arita			Technical Session 12, Chair: Megumi Akai-Kasaya				
11:20-11:45	2A-4	Invited "Current Status and Issues of In-memory Accelerators for Deep Neural Networks" Jun Deguchi Kioxia Corporation, Tokyo, Japan			Invited "Amoeba-inspired Combinatorial Optimization Machines Fusing Digital and Analog" Masashi Aono Amoeba Energy Co., Ltd., Yokohama, Japan			
11:45-12:00	2A-5	Complementary Resistive Switching Characteristics and Gradual Set/Reset Processes in Pt/TaO _x /Ta ₂ O ₅ /Pt Cells	Toshiki Miyatani	Kyoto University, Kyoto, Japan	2B-5	Emulating Retinal Receptive Field by Li-ion-based Neuromorphic System Xiang Wan National Institute for Materials Science, Tsukuba, Japan		
12:00-12:15	2A-6	A Bio-electronic Memristive Interface for Real-time Coupling of Neuronal Populations	Catarina Dias	University of Porto, Porto, Portugal	2B-6	Simulation of Memristor Switching Time Series in Response to Spike-like Signal F. Meshchaninov Moscow Institute of Physics and Technology, Moscow, Russia		
12:15-13:30	Break							
13:30-15:45	Poster Session 2							

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MEMRISYS 2021 Wednesday November 3, 2021 Day 3 (1/2)

Japan Time

Plenary Session 5, Chair: Toshitsugu Sakamoto							
9:00-9:45	PS-5	"Via-switch FPGA with Transistor-free Programmability Enabling Near-Memory Parallel Computation" Masanori Hashimoto Kyoto University, Kyoto, Japan					
9:45-9:55	Break						
		Technical Session 17, Chair: Shoso Shingubara			Technical Session 18, Chair: Joshua Yang		
9:55-10:20	3A-1	Keynote "Radiation-tolerant Atom-switch FPGA" Toshitsugu Sakamoto NanoBridge Semiconductor, Inc., Tsukuba, Japan			3B-1	Keynote "Developing Fully Hardware Implemented Computation-in-Memristor System" Huaqiang Wu Tsinghua University, Beijing, China	
10:20-10:45	3A-2	Invited "Linear & Deterministic Analog Resistive Memory Using Three-terminal Valence-change Memory" Yiyang Li University of Michigan, Ann Arbor, USA			3B-2	Keynote "Artificial Olfactory System" Xin Guo Huazhong University of Science and Technology, Wuhan, China	
10:45-11:00	3A-3	Flexible Resistance Modulation on a SmNiO ₃ Chemical Transistor	Azusa N. Hattori	Osaka University, Osaka, Japan	3B-3	In situ Manipulation of Magnetic Anisotropy in Magnetite Thin Film, Achieved with an All-solid-state Redox Device	Wataru Namiki
11:00-11:10		Break					
		Technical Session 19, Chair: Takashi Tsuchiya			Technical Session 20, Chair: Katsunori Makihara		
11:10-11:25	3A-4	Operando Observation of Analog Resistance Change in Buried Metal/Oxide Interface	Hisashi Shima	National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan	3B-4	C-N-codoped Sb ₂ Te ₃ Chalcogenides for High-performance Phase-change Devices	You Yin
11:25-11:40	3A-5	Reduction of Initial Reset Voltages in Resistive Switching Cells with a Ti/Pr _{0.7} Ca _{0.3} MnO _x Interface	Makoto Imuro	Kyoto University, Kyoto, Japan	3B-5	Cu Movement in MoO _x /Al ₂ O ₃ Double Layer CBRAM Studied by In-situ TEM	Masashi Arita
11:40-11:55	3A-6	Nanoclusters Formation Dynamics Dominated by Dipolar Ionic Diffusion and Reversible Nucleation	Fei Zeng	Tsinghua University, Beijing, China	3B-6	Dynamics of Electric Field-Assisted Hydrogenation in Proton-Doped NdNiO ₃ Thin Film Resistors	Umar Sidik
11:55-13:30		Break					
13:30-15:45		Poster Session 3					
		Technical Session 21, Chair: Regina Dittmann			Technical Session 22, Chair: Marina Yamaguchi		
16:00-16:25	3A-7	Invited "Natural Intelligence in Colloidal Particle Systems with Memory Effects" Toshiharu Saiki Keio University, Yokohama, Japan			3B-7	Invited "Spatiotemporal Information Processing with Oxide-based Electrolyte-Gated Transistors" Da-Shan Shang Institute of Microelectronics (IME), CAS, China	

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Japan Time

MEMRISYS 2021 Thursday November 4, 2021 Day 4 (1/2)

Japan Time

Special Session 2 (IRDS), Chair: Hiroyuki Akinaga							
9:00-9:30	SS-2	"Beyond-CMOS Roadmap - from Boolean Logic to Neuro-Inspired Computing" An Chen IBM Research, USA					
9:30-9:40		Break					
		Technical Session 25, Chair: Cheol Seong Hwang			Technical Session 26, Chair: Yoshifumi Nishi		
9:40-10:05	4A-1	Keynote "Resistive Switching and Neuromorphic Applications of Ferroelectric Tunnel Junctions" Akihito Sawa National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan			4B-1	Keynote "Timing Selector: Using Transient Switching Dynamics to Solve the Sneak Path Issue of Crossbar Arrays" J. Joshua Yang University of Southern California, Los Angeles, USA	
10:05-10:30	4A-2	Invited "Electrode/Nb-doped SrTiO ₃ junction as a physical reservoir device" Kentaro Kinoshita Tokyo University of Science, Tokyo, Japan			4B-2	Keynote "From Memristors to Memristive Neural Networks" Qiangfei Xia University of Massachusetts Amherst, Amherst, USA	
10:30-10:55	4A-3	Invited "Memristive Synapses and Neurons for Bioinspired Computing" Rui Yang Huazhong University of Science and Technology, Wuhan, China			4B-3	Invited "Optimal Data-splitting in RRAM-based Deep Learning Accelerators" Doo Seok Jeong Hanyang University, Seoul, Republic of Korea	
10:55-11:10	4A-4	Ferroelectric HfO ₂ -Based Monolayer MoS ₂ Optical Synaptic Transistor for Neuromorphic Vision Systems	Roda Nur	The University of Tokyo, Tokyo, Japan	4B-4	Building Binary CNN Accelerator with Fine Grain Memristor Crossbars	Changlin Chen
11:10-11:20		Break					
		Technical Session 27, Chair: Azusa N. Hattori			Technical Session 28, Chair: Kentaro Kinoshita		
11:20-11:35	4A-5	Optically-controllable Synaptic Characters of Vertically Aligned Graphene/Diamond Junctions	Kenji Ueda	Nagoya University, Nagoya, Japan	4B-5	Habituation and Sensitization Properties Mimicked in Four-terminal TiO _{2-x} Memristive Devices	Kenta Adachi
11:35-11:50	4A-6	A New Opportunity for the Emerging Tellurium Semiconductor: Making Resistive Switching Devices	Yifei Yang	Tsinghua University, Beijing, China	4B-6	Role of Nonlinearity in Memristive Networks for Reservoir Computing	Gouhei Tanaka
11:50-12:05	4A-7	Development of Physical Reservoir Devices Utilized Redox Reactions of Cu and Ag Ions in Ionic Liquids	Dan Sato	Tokyo University of Science, Tokyo, Japan	4B-7	3D Neuromorphic System Using Memristor Neuron and Fully Depleted Silicon-on-insulator Field Effect Transistor Synapse Devices	Yu-Rim Jeon
12:05-12:20	4A-8	Conductance Control of Free-wiring Conductive Polymer Synapses	Naruki Hagiwara	Hokkaido University, Sapporo, Japan	4B-8	Controlling Retention Characteristics by Post- Annealing in Perovskite-Type Resistive Random Access Memory	Hiromasa Aoki
12:20-13:30		Break					

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