Tentative Program (subject to changes)   **Brain Inspired Computing: Physics, Architectures, Materials and Applications (6-10 Dec 2021)**

Dates	Session Title and Chairperson		Singapore Time (SGT)	Japan Time (JST)	Speaker	University/organization	Title
December 6th Monday	**Artificial Intelligence and Machine Learning** Chair: Yoichiro Tanaka, Tohoku University, Japan	A-1	9:00-9:40 am	10:00-10:40 am	Vinayak Bharat Naik	GlobalFoundries	Spin-Transfer-Torque Based Magnetic Memory for Edge-AI and Spiking Neural Networks
		A-2	9:40-10:20 am	10:40-11:20 am	Mohammed Sabry Aly	NTU Singapore	Next-gen AI system: an End-to-End Approach
		A-3	10:20-11:00 am	11:20-12:00 am	Kelvin Fong	NUS Singapore	Spintronics for Edge AI: Devices-to-Algorithms
	Spin-based Neuromorphic Computing (Neurons and Synapses) Chair: Y. Fukuma, Kyushu Inst. Tech. Japan	B-1	3:00-3:40 pm	4:00-4:40 pm	S.N. Piramanayagam	NTU Singapore	Basics of Spin-based Neuromorphic Computing
		B-2	3:40-4:20 pm	4:40-5:20 pm	Rachid Sbiaa	Sultan Qaboos Univ.	Neural computing with spin torque in multi-state magnetic nanowire
		B-3	4:20-5:00 pm	5:20-6:00 pm	Johan Akerman	U. Gothenburg	Spin Hall nano-oscillator based Ising Machines
December 7th Tuesday	**Neuromorphic applications** Chair: Wang Xiao, NTU Singapore	C-1	9:00-9:40 am	10:00-10:40 am	M. Kondo	Keio Univ.	A Study on Neuromorphic Computing-Based Path Planning and Moving Obstacle Avoidance
		C-2	9:40-10:20 am	10:40-11:20 am	Y. Tanaka	Tohoku Unv.	Data Storage Consideration in Brain Inspired Application
		C-3	10:20-11:00 am	11:20-12:00 am	H. Nomura	Osaka Univ.	Reservoir computing with patterned nanomagnets
	Spin-based data security/computating techniques Chair: Ramu Maddu, NTU Singapore	D-1	3:00-3:40 pm	4:00-4:40 pm	Anupam Chattopadhyay	NTU Singapore	Hardware security premises based on RRAM
		D-2	3:40-4:20 pm	4:40-5:20 pm	S. Fukami	Tohoku Univ.	Stochastic magnetic tunnel junction for probabilistic computing
			4.20-4.30 pm	**5.20-5.30 pm**	**Short break**		
		P-1	4.30-4.45 pm	5.30-5.45 pm	Durgesh Kumar	NTU Singapore	Novel Engineering of Spin-Orbit Torque Layer for Energy-Efficient Synaptic Devices
		P-2	4:45-5:00 pm	5:45-6:00 pm	Sonal Shreya	Aarhus Univ., Denmark	Modeling of Spintronics devices for application-based circuit-level integration
December 8th Wednesday	**Neuromorphic computing circuits** Chair: H. Nomura, Osaka University, Japan	E-1	9:00-9:40 am	10:00-10:40 am	T. Hanyu	Tohoku Univ.	Challenge of MTJ-Based Nonvolatile Logic-in-Memory Circuits and Their Applications
		E-2	9:40-10:20 am	10:40-11:20 am	Brajesh Kumar Kaushik	IIT Roorkee	In-Memory Computing Circuits Using Spin Devices
		E-3	10:20-11:00 am	11:20-12:00 am	S. Sato	Tohoku Univ.	Spiking Neural Network Hardware for Reservoir Computing
	Contributed talks (6 talks) Chair: Rachid Sbiaa, SQ University, Oman		**3:00-4:30 pm**	**4:00-5.30 pm**	**Contributed talks**		
		P-3	3.00-3.15 pm	4.00-4.15 pm	Timothy Ng	NTU SIngapore	Photodetectors that exhibit memory and adaptive capabilities
		P-4	3.15-3.30 pm	4.15-4.30 pm	Mah William	NTU SIngapore	SAF domain wall device as artificial neuron for neuromorphic computing
		P-5	3.30-3.45 pm	4.30-4.45 pm	SP Srilakshmi	NTU Singapore	Optoelectronic transistor sensitized using perovskite quantum dots for synapses
		P-6	3.45-4.00 pm	4.45-5.00 pm	Neha Garg	IIT Delhi, India	Kuramoto-model-based Data classification using the synchronization dynamics of SHNO
		P-7	4.00-4.15 pm	5.00-5.15 pm	Chan JianPeng	NTU SIngapore	Deterministic domain wall motion with SAF pinning sites for synaptic applications
		P-8	4.15-4.30 pm	5.15-5.30 pm	Duckgyu Shin	Tohoku Univ., Japan	Binary neural networks based on CMOS invertible logic
		P-9	4.30-4.45 pm	5.30-5.45 pm	P. Monalisha	IISc Bengaluru, India	Emulation of Synaptic Plasticity in Permalloy based Artificial synapse for NC
December 9th Thursday	**Neuromorphic computing architecture** Chair: Sabpreet Bhatti, NTU Singapore	G-1	9:00-9:40 am	10:00-10:40 am	K. Inoue	Kyushu Univ.	Ultra-Fast, Low-Power Neural Network Computing with Superconductor Devices
		G-2	9:40-10:20 am	10:40-11:20 am	Y. Horio	Tohoku Univ.	Brainmorphic Computational Hardware Framework
		G-3	10:20-11:00 am	11:20-12:00 am	H. Suzuki	Osaka Univ.	Design and implementation of nonlinear dynamics for neuro-inspired computing
	Other types of neuromorphic computing Chair: Y. Horio, Tohoku University, Japan	H-1	3:00-3:40 pm	4:00-4:40 pm	Wang Xiao	NTU Singapore	Engineering of multi-magnetic states toward neuromorphic electronics
		H-2	3:40-4:20 pm	4:40-5:20 pm	Nripan Mathews	NTU Singapore	Ionic and electronic properties of halide perovskites for neuromorphic applications
		H-3	4:20-5:00 pm	5:20-6:00 pm	Weichao Yu	Fudan University, China	Intelligent Magnetic Texutres
December 10th Friday	**Spin-based neuromorphic computing: Spintronics Materials** Chair: Durgesh Kumar, NTU Singapore	I-1	9:00-9:40 am	10:00-10:40 am	Yang Hyunsoo	NUS Singapore	Artificial synapses and neurons using spin-orbit torque devices
		I-2	9:40-10:20 am	10:40-11:20 am	Y. Fukuma	Kyushu Inst. Tech	Classification tasks using nonlinear magnetization dynamics
		I-3	10:20-11:00 am	11:20-12:00 am	Rajdeep Rawat	NIE/NTU	Magnetoimpedance and FMR probing of magnetization dynamics and relaxation in YIG
	Spin-based neuromorphic computing Skyrmions etc. Chair: S.N. Piramanayagam, NTU Singapore	J-1	3:00-3:40 pm	4:00-4:40 pm	Christos Panagopoulos	NTU Singapore	Coupling Topological Solitons in Hybrid Quantum Architectures
		J-2	3:40-4:20 pm	4:40-5:20 pm	Y. Suzuki	Osaka Univ.	Diffusion of the skyrmion and its application to the zero-energy calculation
			4:20-5:00 pm	5:20-6:00 pm			**Concluding remarks/Prize giving ceremony**