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Program Schedule

Tuesday, November 10

Opening Ceremony

Session date and time: 9:00 - 9:20, November 10, 2020

Tuesday, November 10

S1 Session: Plenary Talk 1

Session date and time: 9:20 - 10:05, November 10, 2020

Session Chair: Robert Chen-Hao Chang, National Chung Hsing University

S1-1

Digital Innovation and AI semiconductor in the AI and Post-Corona era.....N/A

Kiyoung Choi, PhD, Ministry of Science and ICT, Republic of Korea

Tuesday, November 10

S1 Session: Plenary Talk 2

Session date and time: 10:05 - 10:50, November 10, 2020

Session Chair: Robert Chen-Hao Chang, National Chung Hsing University

S1-2

Intelligent Chips and Technologies for AIoT Era.....1

Yu-Chin Hsu, PhD, BigObject, Inc.

Tuesday, November 10

S2 Session: Low-Power Industry Solutions

Session date and time: 11:10 - 12:25, November 10, 2020

Session Chairs: Yi Kang, Univ. of Science and Technology/Saki Hatta, Nippon Telegraph and Telephone

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Socionext Inc, Japan

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Samsung Semiconductor India Research, India

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Renesas Electronics Corporation, Japan

Tuesday, November 10

S3 Session: AI/ML Accelerators on FPGA

Session date and time: 11:10 - 12:25, November 10, 2020

Session Chairs: Ji-Hoon Kim, Ewha Womans University/Yong-Pan Liu. Tsinghua University

S3-1 (1157) 11:10-11:35

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{1}Huazhong University of Science and Technology, China; {2}Nanyang Technological University, Singapore; {3}National University of Singapore, Singapore; {4}Singapore University of Technology and Design, Singapore

Tuesday, November 10

S4 Session: High Resolution ADCs with Linearity Enhancement Techniques

Session date and time: 11:10 - 12:00, November 10, 2020

Session Chairs: Yan Zhu, University of Macau/Sanroku Tsukamoto, Fujitsu Laboratories Ltd.

S4-1 (1095) 11:10-11:35

An Input Insensitive Quantization Error Extraction Circuit for 8MHz-BW 79dB-DR CT MASH 採 ADC with Multi-Rate LMS-Based Background Calibration.....N/A

Mitsuya Fukazawa, Masaki Fujiwara, Atsushi Ochi, Raed Alsubaie, Tetsuo Matsui
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Asahi Kasei Microdevices Corp., Japan

Tuesday, November 10

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Session date and time: 12:25 - 13:30, November 10, 2020

Session Chairs: Milin Zhang, Tsinghua University/Zeynep Lulec, Analog Devices

Three separated rooms will be provided by topics. Select the room and join the live discussion.

Topics:

Room 1) what is my advisor talking about every day?

Room 2) what does the life look like in academia?

Room 3) How to find a good job in industry?

Tuesday, November 10

S5 Session: Power Management

Session date and time: 13:30 - 15:35, November 10, 2020

Session Chairs: Makoto Takamiya, University of Tokyo/Hyun-Sik Kim, KAIST

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Yi-Wei Huang, Ting-Yu Yu, Tai-Haur Kuo
National Cheng Kung University, Taiwan

S5-2 (1087) 13:55-14:20

A 2-Phase 3-Level Buck DC-DC Converter with X-Connected Flying Capacitors for Current Balancing.....N/A

Chuang Wang, Yan Lu, Mo Huang, Rui Paulo Martins
University of Macau, China

S5-3 (1135) 14:20-14:45

A Redistributable Capacitive Power Converter for Indoor Light-Powered Batteryless IoT Devices.....N/A

Hao-Chung Cheng, Yu-Tong Su, Po-Han Chen, Po-Hung Chen

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{1}Southern University of Science and Technology, China; {2}University of Macau, Macau

Tuesday, November 10

S6 Session: Low-Power Digital Circuits & Systems

Session date and time: 13:30 - 15:10, November 10, 2020

Session Chairs: Taejoong Song, Samsung Electronics/Yoonmyung Lee, Sungkyunkwan University

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{1}Ingenic Semiconductor CO, China; {2}Southeast University, China; {3}Tsinghua University, China

S6-2 (1017) 13:55-14:20

A Redundancy Eliminated Flip-Flop in 28nm for Low-Voltage Low-Power Applications.....N/A

Gicheol Shin, Eunyoung Lee, Jongmin Lee, Yongmin Lee, Yoonmyung Lee

Sungkyunkwan University, Korea

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National University of Singapore, Singapore

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Jeongsup Lee{3}, Yejoong Kim{3}, Minchang Cho{3}, Makoto Yasuda{2}, Satoru Miyoshi{1}, Masaru Kawaminami{2}, David Blaauw{3}, Dennis Sylvester{3}

{1}Fujitsu Electronics America, Inc., United States; {2}United Semiconductor Japan Co., Ltd., Japan;

{3}University of Michigan, United States

Tuesday, November 10

S7 Session: RF & mm-Wave Chip Systems

Session date and time: 13:30 - 15:35, November 10, 2020

Session Chairs: Minjae Lee, Gwangju Institute of Science and Technology/Bo Zhao, Zhejiang University

S7-1 (1153) 13:30-13:55

A W-Band 4 GHz-BW Multi-User Interference-Tolerant Radar with 28-nm CMOS Front-Ends.....N/A

Rulin Huang{2}, Ching-Wen Chiang{1}, Chia-Jen Liang{1}, Yanghyo Kim{2}, Yen-Cheng Kuan{1}, Mau-Chung Chang{2}

{1}National Chiao Tung University, Taiwan; {2}University of California, Los Angeles, United States

S7-2 (1069) 13:55-14:20

An 800-Ps Origami True-Time-Delay-Based CMOS Receiver Front End for 6.5-9 GHz Phased Arrays.....N/A

Min Li{2}, Nayu Li{2}, Huiyan Gao{2}, Zijiang Zhang{2}, Shaogang Wang{2}, Yen-Cheng Kuan{1}, Xiaopeng Yu{2}, Zhiwei Xu{2}

{1}National Chiao Tung University, Taiwan; {2}Zhejiang University, China

S7-3 (1143) 14:20-14:45

A Ka-Band CMOS 4-Beam Phased-Array Receiver with Symmetrical Beam-Distribution Network.....N/A

Na Peng, Peng Gu, Xiaohu You, Dixian Zhao

Southeast University, China

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Pranith Reddy Byreddy{2}, Yukun Zhu{2}, Harshpreet Singh Bakshi{2}, Kenneth K O{2}, Wooyeol Choi{1}

{1}Oklahoma State University, United States; {2}University of Texas at Dallas, United States

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Kyung-Sik Choi{1}, Keun-Mok Kim{1}, Jinho Ko{2}, Sang-Gug Lee{1}

{1}KAIST, Korea; {2}Phychips Inc., Korea

Tuesday, November 10

S8 Session: Panel Session: What other technologies, together with circuit technology, are necessary for AIoT (AI + IoT)

Session date and time: 15:50 - 17:30, November 10, 2020

Moderators:	Jerald Yoo	National University of Singapore
	Milin Zhang	Tsinghua University
Panelists:	Shigeki Tomishima	Intel
	Massimo Alioto	National Univ. of Singapore
	Sukhwan Lim	Samsung Electronics
	Chen-Yi Lee	National Chiao Tung Univ.
	Yoshinori Miyamae	ROHM Inc.
	Hanjun Jiang	Tsinghua Univ.

Tuesday, November 10

Special Q&A Session

Session date and time: 18:30 - 19:30, November 10, 2020

This session provides all participants an opportunity to verbally with the authors in the virtual rooms separated by sessions of S2 through S7 on November 10.

The track E which shows 1.5-minute summary presentation helps to give essence of each presentation for those who do not listen to the presentations on that day,

All authors of the following sessions join their rooms.

- S2 Low-Power Industry Solutions
- S3 AI/ML Accelerators on FPGA
- S4 High Resolution ADCs with Linearity Enhancement Techniques
- S5 Power Management
- S6 Low-Power Digital Circuits & Systems
- S7 RF & mm-Wave Chip Systems

Tuesday, November 10

Student Design Contest (SDC) Exhibition/ FPGA Demo

Session date and time: 18:30 - 19:30, November 10, 2020

This session provides all participants an opportunity to communicate verbally with the authors of Student Design Contest in the virtual rooms separated by paper/demo.

Take a look at the track D which shows 3-minute demo presentation.

SDC 1/FPGA Demo S3-1 (1157)

An Energy-Efficient GAN Accelerator with On-Chip Training for Domain Specific Optimization

Soyeon Kim, Sanghoon Kang, Donghyeon Han, Sangyeob Kim, Sangjin Kim, Hoi-Jun Yoo
KAIST, Korea

SDC 2/FPGA Demo S3-2 (1039)

A 112-765 GOPS/W FPGA-Based CNN Accelerator Using Importance Map Guided Adaptive Activation Sparsification for Pix2pix Applications

Wenyu Sun, Chen Tang, Zhuqing Yuan, Zhe Yuan, Huazhong Yang, Yongpan Liu
Tsinghua University, China

SDC 3 S7-1 (1153)

A W-Band 4 GHz-BW Multi-User Interference-Tolerant Radar with 28-nm CMOS Front-Ends

Rulin Huang^{2}, Ching-Wen Chiang^{1}, Chia-Jen Liang^{1}, Yanghyo Kim^{2}, Yen-Cheng Kuan^{1}, Mau-Chung Chang^{2}

^{1}National Chiao Tung University, Taiwan; ^{2}University of California, Los Angeles, United States

SDC 4 S11-2 (1115)

Digital Evolution of the Quadrature Balanced Power Amplifier Transceiver for Full Duplex Wireless

Nimrod Ginzberg^{1}, Dror Regev^{2}, Emanuel Cohen^{1}

^{1}Technion - Israel Institute of Technology, Israel; ^{2}Toga Networks, a Huawei Company, Israel

SDC 5 S12-2 (1079)

A Power-Efficient Current Readout Circuit with VCO-Based 2nd-Order CT 采样 ADC for Electrochemistry Acquisition

Hao-Yun Lee, Peng-Wei Huang, Ding-Siang Ciou, Zhan-Xian Liao, Shuenn-Yuh Lee
National Cheng Kung University, Taiwan

SDC 6 S13-2 (1065)

A 0.14 pJ/Conversion Fully Energy-Autonomous Temperature-to-Time Converter for Biomedical Applications

Joanne Si Ying Tan, Jeong Hoan Park, Jiamin Li, Yilong Dong, Kwok Hoe Chan, Ghim Wei Ho, Jerald Yoo
National University of Singapore, Singapore

SDC 7 S14-1 (1002)

Fully-Synthesizable All-Digital Unified Dynamic Entropy Generation, Extraction and Utilization Within the Same Cryptographic Core

Sachin Taneja, Massimo Alioto
National University of Singapore, Singapore

SDC 8 S16-1 (1061)

A 65.5dB SNDR 8.1-11.1nW ECG SAR ADC with Adaptive Latching OSC Based Comparator and DAC Calibration

Kejin Li, Wai-Hong Zhang, Yan Zhu, Chi-Hang Chan, Rui Paulo Martins
University of Macau, Macau

SDC 9 S18-3 (1078)

Wireless Charging EEG Monitoring SoC with AI Algorithm-Driven Electrical and Optogenetic Stimulation for Epilepsy Control

Zhan-Xian Liao^{2}, Yao-Tse Chang^{2}, Chieh Tsou^{2}, Po-Hao Cheng^{2}, Hao-Yun Lee^{2}, Peng-Wei Huang^{2}, Shuenn-Yuh Lee^{2}, Chou-Ching Lin^{3}, Gia-Shing Shieh^{1}

^{1}Ministry of Health and Welfare Tainan Hospital, Taiwan; ^{2}National Cheng Kung University, Taiwan; ^{3}National Cheng Kung University Hospital, Taiwan

FPGA Demo 10 S3-3 (1122)

An Energy-Efficient Multi-Core Restricted Boltzmann Machine Processor with On-Chip Bio-Plausible Learning and Reconfigurable Sparsity

Jiajun Wu^{1}, Xuan Huang^{1}, Le Yang^{1}, Liang Wang^{1}, Jipeng Wang^{1}, Zuozhu Liu^{3}, Kwen-Siong Chong^{2}, Shaowei Lin^{4}, Chao Wang^{1}

^{1}Huazhong University of Science and Technology, China; ^{2}Nanyang Technological University, Singapore; ^{3}National University of Singapore, Singapore; ^{4}Singapore University of Technology and Design, Singapore

Tuesday, November 10

Virtual Banquet/Award Ceremony

Session date and time: 19:30 - 21:00, November 10, 2020

Wednesday, November 11

S9 Session: Plenary Talk 3

Session date and time: 8:30 - 9:15, November 11, 2020

Session Chair: Woogeun Rhee, Tsinghua University

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Wei Tsao

HiSilicon Technologies Co., Ltd., China

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Session date and time: 9:15 - 10:00, November 11, 2020

Session Chair: Woogeun Rhee, Tsinghua University

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Toshiyuki Shimizu, Fujitsu

Wednesday, November 11

S10 Session: Analog Techniques

Session date and time: 10:30 – 12:10, November 11, 2020

Session Chairs: Michael Choi, Samsung/ Vanessa Chen, Carnegie Mellon University

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Gabriele Atzeni, Alessandro Novello, Giorgio Cristiano, Jiawei Liao, Taekwang Jang

ETH Zurich, Switzerland

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Agency for Science, Technology and Research, Singapore

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Fudan University, China

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Xin Xin^{2}, Linxiao Shen^{1}, Xiyuan Tang^{1}, Yi Shen^{3}, Jueping Cai^{3}, Nan Sun^{1}

^{1}University of Texas at Austin, Armenia; ^{2}Xi'an University of Posts and Telecommunications, China;

^{3}Xidian University, China

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Xi'an Jiaotong University, China

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S11 Session: RF Building Blocks

Session date and time: 10:30 – 12:10, November 11, 2020

Session Chairs: Satoshi Tanaka, Murata/Giovanni Mangraviti, imec

S11-1 (1060) 10:30-10:55

A 67fsrms Jitter, –130dBc/Hz In-Band Phase Noise, –256dB FoM Reference Oversampling Digital PLL with Proportional Path Timing Control.....N/A

Ji-Hwan Seol{2}, Kyojin Choo{2}, David Blaauw{2}, Dennis Sylvester{2}, Taekwang Jang{1}
{1}ETH Zurich, Switzerland; {2}University of Michigan, United States

S11-2 (1115) 10:55-11:20

Digital Evolution of the Quadrature Balanced Power Amplifier Transceiver for Full Duplex Wireless.....N/A

Nimrod Ginzberg{1}, Dror Regev{2}, Emanuel Cohen{1}
{1}Technion - Israel Institute of Technology, Israel; {2}Toga Networks, a Huawei Company, Israel

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{1}Jet Propulsion Laboratory, United States; {2}University of California, Davis, United States; {3}University of California, Los Angeles, United States

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Hong Kong University of Science and Technology, Hong Kong

Wednesday, November 11

S12 Session: Circuits and Systems for Emerging Applications

Session date and time: 10:30 – 12:35, November 11, 2020

Session Chairs: Noriyuki Miura, Osaka University/Inhee Lee, University of Pittsburgh

S12-1 (1088) 10:30-10:55

A 40m-Range 90fps CMOS Time-of-Flight Sensor Using SPAD and In-Pixel Time-Gated Pulse Counter.....N/A

Byungchoul Park, Injun Park, Woojun Choi, Yoondeok Na, Youngcheol Chae
Yonsei University, Korea

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Hao-Yun Lee, Peng-Wei Huang, Ding-Siang Ciou, Zhan-Xian Liao, Shuenn-Yuh Lee
National Cheng Kung University, Taiwan

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{1} IHP – Leibniz-Institut für innovative Mikroelektronik, Germany; {2} IHP – Leibniz-Institut für innovative Mikroelektronik & Brandenburg Technical University Cottbus, Germany; {3} IHP – Leibniz-Institut für innovative Mikroelektronik & Technical University Berlin, Germany; {4} IHP Solutions GmbH, Germany; {5} Ulm University, Germany

S12-4 (1089) 11:45-12:10

A Wireline Termination Embedded Energy Harvesting System with 300- μ W Extracted.....N/A

Yu-Hong Yang, Tai-Cheng Lee
National Taiwan University, Taiwan

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Jianming Zhao, Yuan Gao, Beibei Han, Minh Sang Nguyen, Zhipeng Ding, Hyun Kee Chang
Agency for Science, Technology and Research, Singapore

Wednesday, November 11

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Session date and time: 13:40 – 15:20, November 11, 2020

Session Chairs: Wanyuan Qu, Zhejiang University/Milin Zhang, Tsinghua University

S13-1 (1133) 13:40-14:05

A 0.0082mm², 192nW Single BJT Branch Bandgap Reference in 0.18 μ m CMOS.....N/A

Myungjun Kim, Seonghwan Cho
KAIST, Korea

S13-2 (1065) 14:05-14:30

A 0.14 pJ/Conversion Fully Energy-Autonomous Temperature-to-Time Converter for Biomedical Applications.....N/A

Joanne Si Ying Tan, Jeong Hoan Park, Jiamin Li, Yilong Dong, Kwok Hoe Chan, Ghim Wei Ho, Jerald Yoo
National University of Singapore, Singapore

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A 6.4 nW 1.7% Relative Inaccuracy CMOS Temperature Sensor Utilizing Sub-Thermal Drain Voltage Stabilization and Frequency Locked Loop.....N/A

Teruki Someya^{2}, A.K.M. Mahfuzul Islam^{1}, Kenichi Okada^{2}
^{1}Kyoto University, Japan; ^{2}Tokyo Institute of Technology, Japan

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Cheng-Ze Shao, Yu-Te Liao National Chiao Tung University, Taiwan

Wednesday, November 11

S14 Session: SoC for AIoT

Session date and time: 13:40 – 15:20, November 11, 2020

Session Chairs: Pei-Yun Tsai, National Central Univ, Taiwan/Kazutami Arimoto, Okayama Prefectural Univ.

S14-1 (1002) 13:40-14:05

Fully-Synthesizable All-Digital Unified Dynamic Entropy Generation, Extraction and Utilization Within the Same Cryptographic Core.....N/A

Sachin Taneja, Massimo Alioto
National University of Singapore, Singapore

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^{1}KAIST, Korea; ^{2}Massachusetts Institute of Technology, United States; ^{3}Taiwan Semiconductor Manufacturing Company, Limited, Taiwan

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^{1}Agency for Science, Technology and Research, Singapore; ^{2}Nanyang Technological University, Singapore

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^{1}National Central University, Taiwan; ^{2}National Chiao Tung University, Taiwan; ^{3}TSRI National Applied Research Laboratories, Taiwan

Wednesday, November 11

S15 Session: Wireline Transceiver Techniques

Session date and time: 13:40 – 15:20, November 11, 2020

Session Chairs: Ziqiang Wang, Tsinghua University/Tetsuya Iizuka, University of Tokyo

S15-1 (1042) 13:40-14:05

A 6.4-11 Gb/s Wide-Range Referenceless Single-Loop CDR with Adaptive JTOL.....N/A

Hye-Ran Kim {2}, Jun-Yeol Lee {1}, Jeong-Su Lee {1}, Dong-Seok Kang {1}, Jung-Hoon Chun {1},
{1} Sungkyunkwan University, Korea; {2} Sungkyunkwan University and Samsung Electronics Co., Ltd., Korea

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Jaekwon Kim {2}, Youngjun Ko {1}, Jahoon Jin {2}, Jaehyuk Choi {2}, Jung-Hoon Chun {2}
{1} Samsung Electronics Co., Ltd., Korea; {2} Sungkyunkwan University, Korea

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Seoul National University, Korea

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Session date and time: 15:50 – 17:05, November 11, 2020

Session Chairs: Zule Xu, University of Tokyo/Yong Lim, Samsung Electronics

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A 65.5dB SNDR 8.1-11.1nW ECG SAR ADC with Adaptive Latching OSC Based Comparator and DAC Calibration.....N/A

Kejin Li, Wai-Hong Zhang, Yan Zhu, Chi-Hang Chan, Rui Paulo Martins
University of Macau, Macau

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Sogang University, Korea

Wednesday, November 11

S17 Session: Biomedical & Bioinspired SoCs

Session date and time: 15:50 – 17:30, November 11, 2020

Session Chairs: Yun Chen, Fudan University, China/Jun Zhou, University of Electronic Science and Technology of China

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{1}Hualian Tzu Chi Hospital, Taiwan; {2}National Chiao Tung University, Taiwan; {3}National Taiwan University, Taiwan

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A 1.02 μ W STT-MRAM Based DNN ECG Arrhythmia Monitoring SoC with Leakage-Based Delay MAC Unit.....N/A

Kyoung-Rog Lee{1}, Jihoon Kim{1}, Changhyeon Kim{1}, Donghyeon Han{1}, Juhyoung Lee{1}, Jinsu Lee{1}, Hongsik Jeong{2}, Hoi-Jun Yoo{1}

{1}KAIST, Korea; {2}Ulsan National Institute of Science and Technology, Korea

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{1}Columbia University, United States; {2}Samsung Electronics Co., Ltd., Korea

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{1}Research Institute of Tsinghua University in Shenzhen, China; {2}Tsinghua University, China; {3}University of Macau, Macau

Wednesday, November 11

S18 Session: Intelligent Memory & AI/ML-Assisted Biomedical SoCs

Session date and time: 15:50 – 17:30, November 11, 2020

Session Chairs: Ken Takeuchi, University of Tokyo/Chao Wang, Huazhong University of Science and Technology

S18-1 (1056) 15:50-16:15

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Saurabh Jain, Longyang Lin, Massimo Alioto

National University of Singapore, Singapore

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{1} Sungkyunkwan University, Korea; {2} Sungkyunkwan University and Samsung Electronics Co., Ltd., Korea

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{1} Ministry of Health and Welfare Tainan Hospital, Taiwan; {2} National Cheng Kung University, Taiwan;

{3} National Cheng Kung University Hospital, Taiwan

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Aminah Hina, Wala Saadeh

Lahore University of Management Sciences, Pakistan

Wednesday, November 11

Special Q&A Session

Session date and time: 18:30 - 19:30, November 11, 2020

This session provides all participants an opportunity to verbally with the authors in the virtual rooms separated by sessions of S10 through S18 on November 11.

The track E which shows 1.5-minute summary presentation helps to give essence of each presentation for those who do not listen to the presentations on that day,

All authors of the following sessions join their rooms.

S10 Analog Techniques

S11 RF Building Blocks

S12 Circuits and Systems for Emerging Applications

S13 Bandgap and Temperature Sensors

S14 SoC for AIoT

S15 Wireline Transceiver Techniques

S16 High-Speed and Low-Power Techniques for SAR-Based ADCs

S17 Biomedical & Bioinspired SoCs

S18 Intelligent Memory & AI/ML-Assisted Biomedical SoCs