The 15th IEEE International Conference on Anti-counterfeiting, Security, and Identification

(IEEE-ASID’ 2021 Online)

Technical Program

Oct 29-Oct 31, 2021

Xiamen, China

Welcome from the IEEE_ASID'2021 Hosts

Dear IEEE_ASID'2021 Participant,

On behalf of the IEEE-ASID'2021 Committee, I'm honored to have this opportunity to welcome all of you to the 15th International Conference on Anti-counterfeiting, Security, and Identification (IEEE-ASID'2021). This conference was originally scheduled to be held in Xiamen. Unfortunately, due to the COVID-19 situation and for safety of the attendees as our top priority, the IEEE-ASID'2021 is currently held as a virtual event. The conference of this year is organized by the IEEE Beijing Section, Xiamen University, and Xiamen Institute of Electronics (XMIE), and is co-organized by IC Design Center of Fujian Province and Key Laboratory of IC Design & Application Development (Xiamen University).

During these 15 years, the ASID conference is dedicated to providing researchers, engineers and educators with a unique forum on the latest advances in information science, to exchange novel ideas and communicate newest findings. Over 80 technical manuscripts have been received and processed through a rigorous review. Finally, 42 manuscripts have been accepted for presentations. All accepted manuscripts will be presented orally in 4 sessions at the two-day conference and listed in the proceedings. The conference sessions of this year cover 10 technical areas: AI Security and Quantum Computing; Brain-like Computing and Brain-like Intelligent; Deep Learning and Recognition Computing; Big Data and Information Security; Wearable Electronics and Health & Leisure; Micro/Nano-sensor and BioMEMS; Multi-core Processor and Reconfigurable Computing; Cryptographic Algorithm and Security Management; IC Design and System Integration and EMC Theory and RFID Techniques. We believe that this conference will be an exciting event in 2021

Thank you all for your participation and support. We look forward to welcoming you this memorable virtual conference and hope you enjoy it!

Professor Donghui Guo

Chair of the IEEE_ASID'2021

Xiamen University, Xiamen, China

IEEE_ASID'2021 Organizing Committee

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IEEE_ASID'2021 Support Organization

Supporting Organization:

Xiamen Institute of Electronics, Xiamen, Fujian, China

Institute of Modern Circuit & System Technology, Xiamen University, Fujian, China

Co-Sponsor

IEEE Beijing Section, Beijing, China

Xiamen University, Fujian, China

Co-organizer:

Integrated Circuit Design Engineering Technology Research Center of Fujian Province，Xiamen, Fujian, China

Key Laboratory of Integrated Circuit Design and Measurement (Xiamen University), Xiamen, Fujian, China

Online Presentation Instructions in Tencent Meeting

for the Session Chairs and Authors

Download Tencent Meeting：*https://meeting.tencent.com/index.html (PC client is required)*

1 Instructions on How to Share Screen in Tencent Meeting

1.1 When you are in a Tencent Meeting, you can share your screen by clicking Share Screen button on the bottom of Zoom (see Fig. 1 & Fig. 2);

Fig. 1. Bottom control buttons of Tencent Meeting（in Chinese）

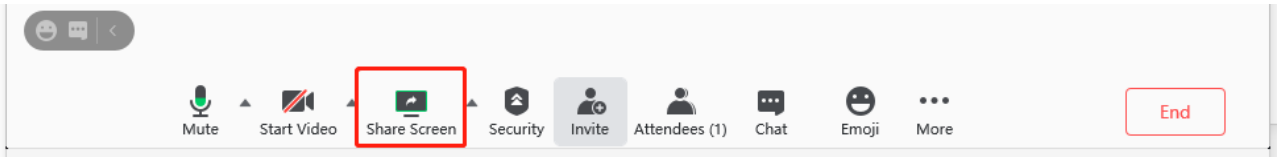


Fig. 2. Bottom control buttons of Tencent Meeting（in English）

1.2 A pop-up window will show to let you choose the screen to share (see Fig. 3);

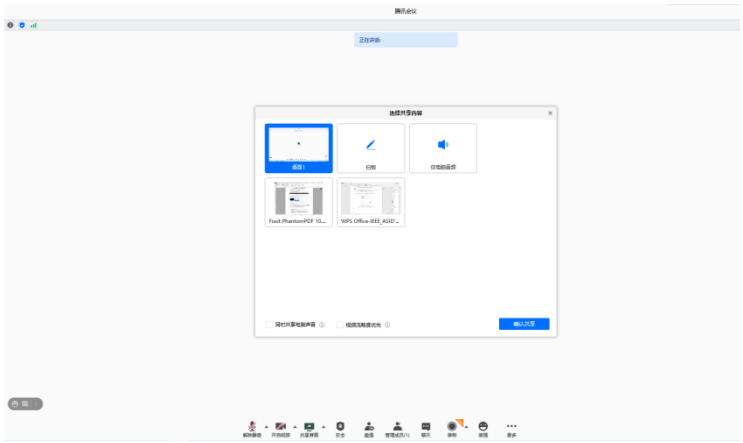


Fig. 3. Pop-up window to select the screen/application to share.

1.3 Be sure to share the window containing your presentation slides.

2 Instructions for Session Chairs

2.1 Please arrive at your room using the respective Tencent Meeting link at least **10** mins before the session;

2.2 Please rename yourself as **"0-Session Chair-XXX (your name in English)"**;

2.3 Our student helpers with name **"0-Support-XXX"** will brief you on the session information with a PowerPoint slide; This slide will be displayed until the session starts;

2.4 The student helper will also make you "co-host" so that you can share your screen when you want to present or help manage the session; please also read Section 1 of this instruction for more information on how to share the screen in Tencent Meeting;

2.5 When the session starts, the student helper will mute the rest participants;

2.6 After you let a speaker present his/her paper; the student helper will make the speaker "co-host" so

that he/she can share the slides;

2.7 Please keep each presentation within the allotted time slot; the student helper will notify you when time is running out;

2.8 During the Q&A, you can encourage audiences to "raise hand"; when you choose an audience, the student helper will unmute him/her;

2.9 For those presentations via pre-recorded videos, the student helper will play the video.

3 Instructions for Speakers

3.1 Please arrive at your room using the respective Zoom Meeting link at least 10 mins before the session;

3.2 Please rename yourself as **"1-Presenter-XXX (your name in English)", "2-Presenter-XXX"**, ……, according to the presentation sequence.

3.3 Our student helpers with name "**0-Support-XXX**" will help test the Share Screen function of Zoom with you; please also read Section 1 of this instruction for more information on how to share the screen in Tencent;

3.4 Once the session chair let you present your work, the student helper will make you "co-host" and you will be able to share your screen;

3.5 If you choose the presentation mode of pre-recorded video, the student helper will play the video for you. In this case, you do not need to share your screen. **A pop-up window will show to let you choose the screen to share (see Fig. 3).**

3.6 Be sure to **Quit Screen Share** when you completed your presentation. You can move your mouse point to the top-middle of your screen and find the tool bar then click the **Stop** button (see Fig. 4 & Fig. 5).

Fig. 4. Quit Screen Share（in Chinese）

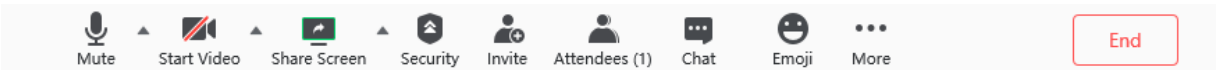
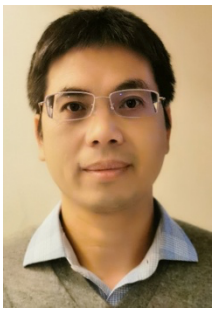


Fig. 5. Quit Screen Share（in English）

4 To Audience:

During Q&A, please "raise hand" and wait for the Chairs to respond. Then, our student helpers will help unmute you.

IEEE_ASID'2021 Keynote Speakers I



Prof. Yimao Cai

School of Electronics Engineering and Computer Science
Peking University, China

Title： In-memory-computing and Brain-inspired Computing Using Neuromorphic Devices

Abstract：

Deep learning has made great success in advancing artificial intelligence such as pattern recognition, natural language processing, network graph analysis, etc. Deep neural networks (DNNs) translate the biological neural network into abstractive network topology and algorithm. The basic elements in DNNs are consist of "neurons", connective "synapses" and network topology. With demanding emphasis on energy efficiency, resistive random-access memory (ReRAM) has been extensively researched to emulate synapse and enables co-location of multilevel memory and analog in-memory computing based on fundamental physical laws. However, the device non-idealities will inevitably impair the performance of RRAM-based in-memory computing systems. Modelling and evaluation of these non-idealities are critical for RRAM-based applications. Beyond engineering in-memory synaptic computing, there are different types of neurons and synapses with multiple functions in biological neural networks. The diversity and cooperation in neurons and synapses can perform more complex functions during the collection, transmission and processing of information, which finally enables intelligent perception and decision-making behavior. The emulation of a biological neural network based on the new neuromorphic device may have remarkable advantages in extending the functionality and improving efficiency. This talk presents modelling and investigation of the impact of non-idealities in RRAM-based in-memory computing systems. Also, we will demonstrate some concepts of implementing novel neuromorphic devices to emulate adaptability and cooperativity inspired by the biological neural network in multi-dimensional information processing.

Biography：

Prof. Yimao Cai received the Ph.D. degree in Microelectronics from Peking University, Beijing, China, in 2006. From 2006 to 2009, he was with R&D center, Samsung Electronics, Korea, where he contributed to the development of 65 nm/45 nm NOR flash chips and their characterization. In 2009, he joined Institute of Microelectronics, Peking University, where he is currently a Professor and the Chair of the Department of Microelectronics. He is the holder of ~30 granted patents and has authored or coauthored four books and over 100 papers. He is the winner of National Science Fund for Distinguished Young Scholars. His research interests include nonvolatile memory devices, neuromorphic devices and the brain-inspired computing technologies.

IEEE_ASID'2021 Keynote Speakers II

Prof. Terry Ye

Department of Electrical and Electronic Engineering,

Southern University of Science and Technology (SUSTech), China

Title: Passive Sensing with Embroidered Electronics

Abstract:

Most of today's wearable electronic products are solid-state devices that are either attached to human bodies, or used as accessories on apparels. They do not feel natural to human, and they are often rigid, intruding and uncomfortable. Aesthetic wearable electronics and the integration to apparels has been an active research focus recently. Embroidered electronics and structures, i.e., using embroidering materials, structures, and process to implement electronic devices, will open a new paradigm for body area networks. As the devices being woven and embroidered with fibers and yarns and seamlessly built into daily clothes or fabrics, wearable electronics can be truly "wearable".

In this presentation, we will demonstrate researches that utilize conductive fibers and other specially embroidered structures to achieve many electromagnetic functions that include antennas, sensors, energy harvesters and signal and power interconnects. Specifically, we propose several embroidered structures, the impedance and electromagnetic properties of these structures will vary with the change of ambient conditions, such as pressure, bending, twisting and stretching. Utilizing the proposed structures with NFC and RFID transponder chips, passive and battery-less sensing capabilities can be achieved. This research will provide a new platform and user experience for next generation wearable electronics.

Biography:

Dr. Terry Ye received his Ph.D. in Electrical Engineering from Stanford University and the Bachelor of Science in Electronic Engineering from Tsinghua University (Beijing). He is the Professor at the Department of Electrical and Electronics Engineering (EEE) at Southern University of Science and Technology (SUSTech), and by courtesy, an Adjunct Professor at the Department of Electrical and Computer Engineering (ECE) at Carnegie Mellon University. Dr. Ye is active in both academic research as well as industrial applications in many engineering areas that include IC Designs, Neuromorphic Computing ICs, Internet-of-Things (IOT) and Wireless Sensor Devices. Prior to SUSTech, Dr. Ye had been the Professor of CMU-SYSU Joint Institute of Engineering since 2014, as well as the Director of Research and Technology Development of Hong Kong R&D Center for Logistics and Supply Chain Management (LSCM) since the center's inception in 2007. He also serves as the research fellow at the University of Hong Kong and the Chief Scientist of IOT Lab at Hong Kong University of Science and Technology. Beside his academic activities, Dr. Ye is keen on industry-academic collaborations. He had held various engineering and consulting roles in China Academy of Science, Impinj Inc, Synopsys Inc., Analog Device Inc., Magma Design Automation Inc., Silicon Architects Inc. and many other Silicon Valley companies.

IEEE_ASID'2021 Keynote Speakers III

Prof. Xiaopeng Yu

School of Micro-Nano Electronics,
Zhejiang University, China

Title: Digital Temperature Sensors for CMOS SoC

Abstract:

Sensors play important roles in transferring physical world to digital information. As a fundamental physical quantity, the measurement of temperature has been the essential function in industrial applications. With the rapid development of integrated circuits, fully integrated temperature sensor has been one of the key building blocks in CMOS System-on-Chips (SoC). Many recent designs have been proposed to achieve high-resolution, low cost, small size, all-digital, etc. This work presents a leakage-based digital temperature sensor with reduced supply sensitivity for on-chip thermal management. The sensor, featured with a novel supply sensitivity suppression mechanism, performs the temperature-to-frequency conversion by a leakage-dominated ring oscillator (LDRO) with exponential temperature dependence.

Biography:

Prof. Xiaopeng Yu was born in Zhejiang, China. He received B. Eng. degree from the Department of Optical Engineering, Zhejiang University, Hangzhou, China, in 1998, and Ph.D. degree from the School of EEE, Nanyang Technological University (NTU), Singapore, in 2006. He was an engineer with the MOTOROLA Global Telecom Solution Sector, Hangzhou from 2000 to 2002 and was a Research Staff with NTU from 2005 to 2006. Since 2006, he has been working with the Institute of VLSI Design, Zhejiang University, where he is currently a full professor. He was with the Mixed Signal Microelectronics group, Eindhoven University of Technology, the Netherlands, as a visiting scholar and a Marie Curie Fellow (Co-hosted with Philips Research, Eindhoven) from 2008 to 2010. His current research interests include mixed signal integrated circuits, radio-frequency integrated circuits, and reliability-orientated integrated circuits in CMOS technology.

The 15th IEEE International Conference on Anti-counterfeiting, Security, and Identification (IEEE-ASID'2021)

Schedule Overview

	October 30th, 2021 (Saturday)	
09:30~09:35	**Open Ceremony** Tencent Meeting ID: **907 821 498** , Password: **2021** Link: https://meeting.tencent.com/dm/lB5xbMwFY52L	
09:35~10:20	**Keynote Speech I: Prof. Yimao Cai (Professor, Peking University)** Title: In-memory-computing and Brain-inspired Computing Using Neuromorphic Devices	
10:20~11:05	**Keynote Speech II: Prof. Terry Ye (Professor, Southern University of Science and Technology)** Title: Passive Sensing with Embroidered Electronics	
11:05~11:50	**Keynote Speech III:Prof. Xiaopeng Yu (Professor, Zhejiang University)** Title: Digital Temperature Sensors for CMOS SoC	
11:50~13:00	**Lunch Break**	
	Session 1-Deep Learning and Recognition Computing **Session Chair: Prof. Huarong Xu** Tencent Meeting ID: **488 817 637** , Password: **2021** Link: https://meeting.tencent.com/dm/BwXyhI29m6lB	**Session 3-Cryptographic Algorithm and Security Management** **Session Chair: Prof. Niansheng Liu** Tencent Meeting ID: **485 339 845** , Password: **2021** Link: https://meeting.tencent.com/dm/PRbdUsma6Mtf
13:00~13:10	A Novel Affine Projection Algorithm Based on Variable Projection Order ***Yufei Han****, Yibo Li, Yao Li*	A Novel SPA Countermeasure for SM2 Hardware Implementation with FPGA ***Jiahao Fang****, Liji Wu*, Xiangming Zhang*
13:10~13:20	VLSI Architecture Design for Adder Convolution Neural Network Accelerator ***Mingyong Zhuang****, Xinhui Liao, Huhong Wu, Jianyang Zhou , Zichao Guo**	A Single Event Effect Simulation Method for RISC-V Processor ***Quanxiu Chen****, Yi Liu*, Zhenyu Wu, Jian Liao*
13:20~13:30	Energy-Efficient Deep Neural Networks Implementation on a Scalable Heterogeneous FPGA Cluster ***Yanbu Hu****,Cuiping Shao*, Huiyun Li*	A Polynomial Multiplication Accelerator for Homomorphic Encryption using DGT ***Jigang Yang****, Zhenmin Li, Jingwei Ren, Xiaolei Wang ,Wei Ni ,Gao-ming Du**
13:30~13:40	FPGA Implementation of Hardware Accelerator for Real-time Video Image Edge Detection ***Xiangxiang Wei****, Gao-ming Du, Xiaolei Wang*, Hongfang Cao, Shijie Hu, Duoli Zhang, Zhenmin Li*	Secure Turbo-Polar Codes Information Transmission on Wireless Channel ***Guangming Zhu****, Deyuan Chen* , Can Zhang, Yongzhi Qi*
13:40~13:50	LMS Based Ultra-Fast Non Linearity Test and Calibration Method for High-speed and High_x0002_Resolution ADC ***Ting Li****, Yabo Ni, Yong Zhang, Chao Chen*	A High-Speed Carry-Select Adder with Optimized Block Sizes ***Ying-Yi Chu****, Shao-Hui Shieh, Hai Feng, Hanyong Deng, Miin-Shyue Shiau, Der-Chen Huang*
13:50~14:00	**Break**	
14:00~14:10	Delay Cells for the Time-to-Digital Converter Implemented in FPGA ***Ze-Xian Chen****, Zhiquan Wang, Guolan Peng, Miin-Shyue Shiau*, Hong-Chong Wu, Ching-Hwa Cheng, Don-Gey Liu*	HLS-centric DSE and Optimization for Dynamically Reconfigurable Elliptic Curve Cryptography (ReCC) ***Arthur Silitonga****, Yigit Kiyak, Juergen Becker*
14:10~14:20	Design of Combinational Digital Circuits Optimized with Ising Model and PSO Algorithm ***Ying Li****, Penglei Zhao, Bingrui Guo, Chenhui Zhao, Xiaojie Liu, Shan He, Donghui Guo**	A Survey on Privacy-preserving Schemes for Vehicular Ad Hoc Networks ***Jianyang Cui****, Ying Cai*, Shaocheng Yang, Yu Zhang*
14:20~14:30	Simulators for Deep Neural Network Accelerator Design and Analysis: A Brief Review ***Mijing Sun****, Li Xu, Zhenmin Li*, Wei Ni, Gaoming Du, Xiaolei Wang, Yongsheng Yin*	A Quantum Ring Signature Scheme Based on the Quantum Finite Automata Signature Scheme ***Hongji Wang****, Gang Yao , Beizhan Wang**
14:30~14:40	A Non-Intrusive Self-Calibration Method for the Circuit Design of Inductorless Low Noise Amplifier ***Wenrun Xiao****, Weikang Wu, Yinghui Chang, Jidong Diao,Yanping Qiao, Xianming Liu, Shan He, Xiaojie Liu, Donghui Guo**	Hardware Design of SHA-3 for PQC Classic McEliece ***Xin Zhou****, Liji Wu*, Xiangmin Zhang*
14:40~14:50	An Encryption Traffic Classification Method Based on ResNeX ***Yidan Li****, Yanli Chen, Runze Chen, Lan Yin, Fangming Ruan**	A Precise 3D Positioning Approach Based on UWB with Reduced Base Stations *Zhiqiang Xu, Zhuowei Liang,* ***Ziheng Zhou****, Zhenmin Li*, Gao-ming Du, Xiaolei Wang, Yu-kun Song*
14:50~15:00	An Improved ECG Denoising Algorithm Based on Wavelet-scale Correlation Coefficients ***Wei Liu****, Yongzhao Du**	
15:00~15:30	**Session Break**	

	Session 2-Network and Graph Analysis **Session Chair: Prof. Jiyang Dong** Tencent Meeting ID: **488 817 637** , Password: **2021** Link: https://meeting.tencent.com/dm/BwXyhI29m6lB	**Session 4-IC Design and System Integration** **Session Chair: Prof. Jianyang Zhou** Tencent Meeting ID: **485 339 845** , Password: **2021** Link: https://meeting.tencent.com/dm/PRbdUsma6Mtf
15:30~15:40	Parallel Concatenated Code Combining Polar Code and LDPC Code on AWGN Channel ***Luyao Ma****, *Lijun Zhang*	Porting RT-Thread to AnnikaSoC ***Zhirui Li***, *Jian Li, Yunrui Zhang, Jianyang Zhou, Zichao Guo**
15:40~15:50	Moving Object Detection and Marking Based on Frame Difference and Train Algorithm for Teaching Video ***Zhenyu Wang***, *Junping Wang*, Na Wang*	A Novel Active Inductor with Almost Simultaneously Constant L and Peak Q at Different Frequencies and Independent Q Tunability ***Yamei Xu***, *Wanrong Zhang*, Hongyun Xie, Dongyue Jin, Weicong Na, Yan Liang, Ziteng Cai*
16:00~16:10	Low-light image enhancement based on FPGA *Xiaohong Peng , **Xuefeng Li***, Shuqin Geng , Jie Wang , Fengjun Nie*	An Approximate Adder Design Based on Inexact Full Adders ***Wenqiang Yang***, *Lunyao Wang*, Kailei Li*
16:10~16:20	Automatic Recognition of Fetal Heart Standard Section Based on Fast-RCNN ***Bingzheng Wu***, *Huiling Wu, Yongzhao Du, Peizhong Liu**	Design of A New Type of Regular Expression Matching Engine Based on FPGA *Nan Jiang,Ping Lin,**Yulong He**,Zhuozhi Tan,Jin Hu**
16:20~16:30	An Intelligent Error Compensation Method for Height Measurement of Bump Package ***Ruiqian Ye***, *Peng Zheng, Yun Gao, Chun Lin*, Zili Zhang, Fanchang Men*	A Novel Active Inductor with High Q Factor and Inductance and Mutually Independent Tuning Characteristic ***Yan Liang***, *Wanrong Zhang*, Hongyun Xie, Dongyue Jin,Weicong Na, Yamei Xu, ZiTeng Cai*
16:30~16:40	**Break**	
16:40~16:50	Area Optimization Using DC Cover Based Approximate Computing Technique ***Xuanye Dai***, *Weikai Zhao, Lunyao Wang**	Design of a Low-Voltage Instrumentation Amplifier at 1.2 V *Jeni Liao, Jianxiong Yang , Kangling, Minjuan Zheng , **Miin-Shyue Shiau***, Hong-Chong Wu, Ching-Hwa Cheng, Don-Gey Liu*
16:50~17:00	Multi Loss Function for Cross-Modality Person Re-Identification ***Furong Liu***, *Fengsui Wang*, Jingang Chen, Qisheng Wang*	Design of a column-parallel SAR/SS two-step hybrid ADC for sensor arrays ***Zheng Wang***, *Xu Liu* , Peiyuan Wan, Zhijie Chen*
17:10~17:20	A Simple DDoS Defense Method Based SDN ***Runze Chen***, *Fangming Ruan* , Yidan Li, Lan Yin, Yanli Chen*	Digital Decimation Filter Design for a 3rd-Order Sigma-Delta Modulator with Achieving 129 dB SNR ***Dongyu Li***, *Zhijie Chen, Xu Liu, Zhiqi Shen, Yanhui Xing, Peiyuan Wan*
17:20~17:30	Cervical Lesions Classification Based on Pre-trained MobileNet Model ***Tianxiang Xu***, *Ping Li*, Xiaoxia Wang*	Designs of 16-to-24-GHz Inductor-Capacitor Digitally-Controlled Oscillators in 40-nm CMOS ***Yanian Shao***, *Xuefei Bai*, Zhe Yang*
17:30~17:40	Subcircuit Identification Method Based on Subgraph Isomorphism ***Guangxian Dong***, *Yalin Zheng, Shan He, Donghui Guo, Li Lin**	RF Front-end with Antenna for Bluetooh Wireless of Medical Biosensing ***Wen-Cheng Lai****,*Yi Wu*
17:40~17:50		AnnikaCore: RISC-V Architecture Processor Design and Implementation for IoT ***Yunrui Zhang***, *Zichao Guo*, Jian Li, Fan Cai, Jianyang Zhou*
17:50~18:00		A SAR-based Fast Automatic Frequency Tuning Circuit in a 3-th Order Active-RC Complex Filter ***Boyong Jin***, *Zhijie Chen, Xu Liu, Zhiqi Shen, Yucheng Bao, Yanhui Xing, Peiyuan Wan**
	End **Thanks for your participation and cooperation**	