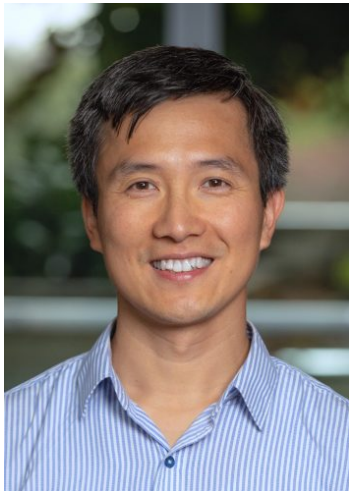




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March 2020

UPCOMING SSCS & PELS JOINT WEBINAR



Integrated Power Delivery and Management for High-Performance Digital Systems

**Presenter: Prof. Hanh-Phuc Le,
University of California, San Diego
Wednesday, April 22nd
11:00 AM ET (New York)**

Abstract: The need for an efficient power management solution has never been more critical across virtually all electronic devices

and systems from low power to high power, smartphones to data centers, battery-powered components to renewable-energy-powered grids, and from stationary systems to aircraft. The key, common challenge for power management in these systems is to satisfy increasingly demanding requirements in terms of efficiency, size, reliability, and cost, simultaneously. This talk will present a unique flow of integrated power converter architectures, topologies, and circuit techniques to address this challenge. Particularly, the speaker will discuss his group research work on a family of hybrid converters that achieve high efficiency for high output power density and current density.

Biography: Dr. Hanh-Phuc Le is Assistant Professor of ECE at the University of California, San Diego. He received the B.S. from Hanoi University of Science and Technology in Vietnam (2004), M.S. from KAIST, Korea (2006), and Ph.D. from UC Berkeley (2013), all in Electrical Engineering. In 2012, he co-founded and served as the CTO at Lion Semiconductor until October 2015. He was with the University of Colorado Boulder from 2016 to 2019, and recently joined the ECE department at UCSD. He also held R&D positions at Oracle, Intel,

Rambus, JDA Tech in Korea and the Vietnam Academy of Science and Technology (VAST) in Vietnam. His current research interests include miniaturized/on-die power conversions, large conversion ratios, smart power delivery and control for high performance IT systems, data centers, telecommunication, robots, automotive, mobile, wearable, and IoT applications. Dr. Le received the 2012-2013 IEEE Solid-State Circuits Society Pre-doctoral Achievement Award, and the 2013 Sevin Rosen Funds Award for Innovation at UC Berkeley. He authored two book chapters, over forty journal and conference papers with one best paper award, and is an inventor with 18 U.S. patents (10 granted and 8 pending). He serves as an associate editor of the IEEE Journal of Emerging and Selected Topics in Power Electronics (JESTPE), the TPC chair for the 2018 International Workshop on Power Supply On Chip (PwrSoC 2018), and TPC co-chair for PwrSoC 2020. He is currently the chair of the IEEE Power Electronics Society Technical Committee on Power Conversion Systems and Components (IEEE PELS TC2).

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NEWS

SSCS Statement on COVID-19

The Solid-State Circuits Society is closely monitoring developments related to the rapidly evolving COVID-19 pandemic.

The health and safety of our members is the number one priority of our society. SSCS Leadership is working diligently with IEEE to define a course of action that will take local regulations into consideration while ensuring that the hard work of our conference organizers and authors is not minimized by the impact of this pandemic.

Several SSCS sponsored conferences and workshops have already made the decision to move to web-hosted events, while other conferences have decided to reschedule.

We will do our best to keep you posted.

[Click here](#) for information about SSCS' upcoming conferences and COVID-19

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- **eBooks:** SSCS has two books available for download - [IC Design Insights](#) - a selection of tutorial and invited presentations given at CICC 2017 and [Low Power Circuit Design Using Advanced CMOS Technology](#) - part of the Tutorials in Circuits and Systems series.
- **CONFedu Series:** The CONFedu series features short 10-minute talks from SSCS sponsored conferences including ISSCC, CICC, ESSCIRC, and VLSI. [Click here to access.](#)
- **SSCSx Lecture Series:** The first series of lectures is five parts and is presented by Prof. Behzad Razavi on Noise. [Click here to access.](#)

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will have an independent editorial board, established peer-review process, and will be fully compliant with funder mandates, including Plan S. SSCS members receive a discount on Article Processing Charges. For more information or to submit a paper, [click here](#).

EDUCATION

Upcoming 2020 Distinguished Lectures

Due to the COVID-19 Pandemic, there are currently no SSCS Distinguished Lectures scheduled.

CONFERENCES

Upcoming 2020 SSCS-Sponsored Conferences

2020 International Symposium on VLSI Technology, Systems, and Applications (VLSI-TSA) Hsinchu, Taiwan	Rescheduled to August 10th -13th, 2020
2020 International Symposium on VLSI Design, Automation, and Test (VLSI-DAT) Hsinchu, Taiwan	Rescheduled to August 10th -13th, 2020
2020 IEEE Symposia on VLSI Technology and Circuits Honolulu, Hawaii	Jun 14 - 19, 2020 To be held virtually
2020 IEEE Radio Frequency Integrated Circuits	Jun 21 - 23, 2020

Symposium (RFIC) Los Angeles, California	
2020 European Solid-State Circuits Conference/2020 European Solid-State Device Research Conference Grenoble, France	Sept. 14 - 18, 2020
2020 IEEE Biomedical Circuits and Systems Conference (BioCAS) Berlin, Germany	Rescheduled for October 2021
2020 IEEE BiCMOS and Compound Semiconductor Integrated Circuits and Technology Symposium (BCICTS) Monterey, California	Nov 8 - 11, 2020
2020 IEEE Asian Solid-State Circuits Conference (A-SSCC) Hiroshima, Japan	Nov. 9 - 11, 2020

SSCS-Sponsored Conferences: Proceedings

Click the links below to access the latest SSCS-Sponsored conference proceedings.

2018

[2018 IEEE International Solid-State Circuits Conference \(ISSCC\)](#)

[2018 IEEE Custom Integrated Circuits Conference \(CICC\)](#)

[2018 IEEE Symposium on VLSI Circuits \(VLSI\)](#)

[2018 IEEE 44th European Solid-State Circuits Conference \(ESSCIRC\)](#)

[2018 IEEE Asian Solid-State Circuits Conference \(A-SSCC\)](#)

2019

[2019 IEEE International Solid-State Circuits Conference \(ISSCC\)](#)

[2019 IEEE Custom Integrated Circuits Conference \(CICC\)](#)

[2019 Symposium on VLSI Circuits](#)

[2019 IEEE 45th European Solid-State Circuits Conference \(ESSCIRC\)](#)

PUBLICATIONS

The latest in SSCS Flagship Publications...



IEEE Journal of Solid-State Circuits

Vol. 55, Issue 4, April 2020

Special Issue on the 2019
Symposium on VLSI Circuits

[A CMOS Temperature Stabilized 2-D Mechanical Stress Sensor With 11-bit Resolution](#)

Umidjon Nurmetov ; Tobias Fritz ; Ernst Müllner ; Christopher M. Dougherty ; Michael Szelong ; Franz Kreupl ; Ralf Brederlow

[A Smart Contact Lens Controller IC Supporting Dual-Mode Telemetry With Wireless-Powered Backscattering LSK and EM-Radiated RF Transmission Using a Single-Loop Antenna](#)

Cheonhoo Jeon ; Jahyun Koo ; Kyongsu Lee ; Minseob Lee ; Su-Kyoung Kim ; Sangbae Shin ; Sei Kwang Hahn ; Jae-Yoon Sim

[Vocell: A 65-nm Speech-Triggered Wake-Up SoC for 10- \$\hat{1}\$ /₄ W Keyword Spotting and Speaker Verification](#)

Juan Sebastian P. Giraldo ; Steven Lauwereins ; Komail Badami ; Marian Verhelst

[A Time Domain Artificial Intelligence Radar System Using 33-GHz Direct Sampling for Hand Gesture Recognition](#)

Jungwoon Park ; Junyoung Jang ; Geunhaeng Lee ; Hyunmin Koh ; Changhwan Kim ; Tae Wook Kim

[A VGA Indirect Time-of-Flight CMOS Image Sensor With 4-Tap 7- \$\mu\$ m Global-Shutter Pixel and Fixed-Pattern Phase Noise Self-Compensation](#)

Min-Sun Keel ; Young-Gu Jin ; Youngchan Kim ; Daeyun Kim ; Yeomyung Kim ; Myunghan Bae ; Bumsik Chung ; Soho Son ; Hogyun Kim ; Taemin An ; Sung-Ho Choi ; Taesub Jung ; Yonghun Kwon ; Sungyoung Seo ; Sae-Young Kim ; Kwanghyuk Bae ; Seung-Chul Shin ; Myoungoh Ki ; Seoungjae Yoo ; Chang-Rok Moon ; Hyunsurk Ryu ; Joonseok Kim

[A 640 x 640 Fully Dynamic CMOS Image Sensor for Always-On Operation](#)

Injun Park ; Woojin Jo ; Chanmin Park ; Byungchoul Park ; Jimin Cheon ; Youngcheol Chae

[Liquid Silicon: A Nonvolatile Fully Programmable Processing-in-Memory Processor With Monolithically Integrated ReRAM](#)

Yue Zha ; Etienne Nowak ; Jing Li

[A 0.32-128 TOPS, Scalable Multi-Chip-Module-Based Deep Neural Network Inference Accelerator With Ground-Referenced Signaling in 16 nm](#)

Brian Zimmer ; Rangharajan Venkatesan ; Yakun Sophia Shao ; Jason Clemons ; Matthew Fojtik ; Nan Jiang ; Ben Keller ; Alicia Klinefelter ; Nathaniel Pinckney ; Priyanka Raina ; Stephen G. Tell ; Yanqing Zhang ; William J. Dally ; Joel S. Emer ; C. Thomas Gray ; Stephen W. Keckler ; Brucek Khailany

[A 7.3 M Output Non-Zeros/J, 11.7 M Output Non-Zeros/GB Reconfigurable Sparse Matrix-Matrix Multiplication Accelerator](#)

Dong-Hyeon Park ; Subhankar Pal ; Siying Feng ; Paul Gao ; Jielun Tan ; Austin Rovinski ; Shaolin Xie ; Chun Zhao ; Aporva Amarnath ; Timothy Wesley ; Jonathan Beaumont ; Kuan-Yu Chen ; Chaitali Chakrabarti ; Michael Bedford Taylor ; Trevor Mudge ; David Blaauw ; Hun-Seok Kim ; Ronald G. Dreslinski

[A 4900- \$\mu\$ m² 839-Mb/s Side-Channel Attack-Resistant AES-128 in 14-nm CMOS With Heterogeneous Sboxes, Linear Masked MixColumns, and Dual-Rail Key Addition](#)

Raghavan Kumar ; Vikram Suresh ; Monodeep Kar ; Sudhir Satpathy ; Mark A. Anders ; Himanshu Kaul ; Amit Agarwal ; Steven Hsu ; Gregory K. Chen ; Ram K. Krishnamurthy ; Vivek De ; Sanu K. Mathew

[A 7-nm 4-GHz Arm¹-Core-Based CoWoS¹ Chiplet Design for High-Performance Computing](#)

Mu-Shan Lin ; Tze-Chiang Huang ; Chien-Chun Tsai ; King-Ho Tam ; Kenny Cheng-Hsiang Hsieh ; Ching-Fang Chen ; Wen-Hung Huang ; Chi-Wei Hu ; Yu-Chi Chen ; Sandeep Kumar Goel ; Chin-Ming Fu ; Stefan Rusu ; Chao-Chieh Li ; Sheng-Yao Yang ; Mei Wong ; Shu-Chun Yang ; Frank Lee

[Integrated Power Management for Battery-Indifferent Systems With Ultra-Wide Adaptation Down to nW](#)

Longyang Lin ; Saurabh Jain ; Massimo Alioto

[A Variation-Adaptive Integrated Computational Digital LDO in 22-nm CMOS With](#)

[Fast Transient Response](#)

Khondker Zakir Ahmed ; Harish K. Krishnamurthy ; Charles Augustine ; Xiaosen Liu ; Sheldon Weng ; Krishnan Ravichandran ; James W. Tschanz ; Vivek De

[Direct 48-/1-V GaN-Based DC-DC Power Converter With Double Step-Down Architecture and Master-Slave AO2T Control](#)

Dong Yan ; Xugang Ke ; D. Brian Ma

[A 6.78-MHz Single-Stage Wireless Charger With Constant-Current Constant-Voltage Charging Technique](#)

Lin Cheng ; Xinyuan Ge ; Wai Chiu Ng ; Wing-Hung Ki ; Jiawei Zheng ; Tsz Fai Kwok ; Chi-Ying Tsui ; Ming Liu

[An Energy-Efficient Comparator With Dynamic Floating Inverter Amplifier](#)

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[A Continuous-Time Zoom ADC for Low-Power Audio Applications](#)

Burak Gönen ; Shoubhik Karmakar ; Robert van Veldhoven ; Kofi A. A. Makinwa

[A Pipeline SAR ADC With Second-Order Interstage Gain Error Shaping](#)

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[A 7-nm FinFET CMOS PLL With 388-fs Jitter and \$\hat{a}^{\wedge}80\$ -dBc Reference Spur Featuring a Track-and-Hold Charge Pump and Automatic Loop Gain Control](#)

Chen-Ting Ko ; Ting-Kuei Kuan ; Rueti-Pin Shen ; Chih-Hsien Chang

[A Fully Integrated 0.27-THz Injection-Locked Frequency Synthesizer With Frequency-Tracking Loop in 65-nm CMOS](#)

Xiaolong Liu ; Howard C. Luong

[Sub-Sampling Direct RF-to-Digital Converter With 1024-APSK Modulation for High Throughput Polar Receiver](#)

Hechen Wang ; Fa Foster Dai ; Zhan Su ; Yanjie Wang

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Yoel Krupnik ; Yevgeny Perelman ; Itamar Levin ; Yosi Sanhedrai ; Roe Eitan ; Ahmad Khairi ; Yizhak Shifman ; Yoni Landau ; Udi Virobnik ; Noam Dolev ; Alon Meisler ; Ariel Cohen

[A Laser-Forwarded Coherent Transceiver in 45-nm SOI CMOS Using Monolithic Microring Resonators](#)

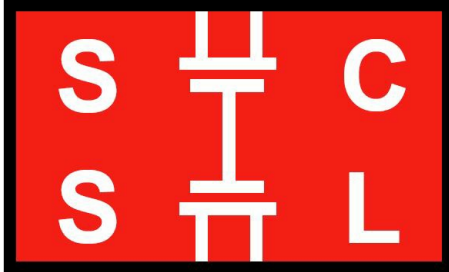
Nandish Mehta ; Sen Lin ; Bozhi Yin ; Sajjad Moazeni ; Vladimir Stojanović

[Design of a 50-Gb/s Hybrid Integrated Si-Photonic Optical Link in 16-nm FinFET](#)

Mayank Raj ; Yohan Frans ; Ping-Chuan Chiang ; Sai Lalith Chaitanya Ambatipudi ; David Mahas

[A 1.02-pJ/b 20.83-Gb/s/Wireless Transceiver Using CNRZ-5 in 16-nm FinFET](#)

Armin Tajalli ; Mani Bastani Parizi ; Dario Albino Carnelli ; Chen Cao ; Kiarash Gharibdoust ; Davide Gorret ; Amit Gupta ; Christopher Hall ; Ahmed Hassanin ; Klaas L. Hofstra ; Brian Holden ; Ali Hormati ; John Keay ; Yohann Mogentale ; Victor Perrin ; John Phillips ; Sumathi Raparthy ; Amin Shokrollahi ; David Stauffer ; Richard Simpson ; Andrew Stewart ; Giuseppe Surace ; Omid Talebi Amiri ; Emanuele Truffa ; Anton Tschanz ; Roger Ulrich ; Christoph Walter ; Anant Singh



[A 0.58-to-0.9-V Input 0.53-V Output 2.4- \$\mu\$ W Current-Feedback Low-Dropout Regulator With 99.8% Current Efficiency](#)

Ziyu Wang ; Shahriar Mirabbasi

[A Cryogenic CMOS Parametric Amplifier](#)

Mohammadreza Mehrpoo ; Fabio Sebastiano ; Edoardo Charbon ; Masoud Babaie

[A 117-dB In-Band CMRR 98.5-dB SNR Capacitance-to-Digital Converter for Sub-nm Displacement Sensing With an Electrically Floating Target](#)

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[A 2.6 TOPS/W 16-Bit Fixed-Point Convolutional Neural Network Learning Processor in 65-nm CMOS](#)

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[A 1-V 8.1- \$\mu\$ W PPG-Recording Front-End With > 92-dB DR Using Light-to-Digital Conversion With Signal-Aware DC Subtraction and Ambient Light Removal](#)

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[Secondary Side-Channel Wireline Communication Using Transmitter Clock Frequency Modulation](#)

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[A Coarse-Fine VCO-ADC for MEMS Microphones With Sampling Synchronization by Data Scrambling](#)

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[A Fully-Synthesizable Fractional-N Injection-Locked PLL for Digital Clocking with Triangle/Sawtooth Spread-Spectrum Modulation Capability in 5-nm CMOS](#)

Bangan Liu ; Yuncheng Zhang ; Junjun Qiu ; Hongye Huang ; Zheng Sun ; Dingxin Xu ; Haosheng Zhang ; Yun Wang ; Jian Pang ; Zheng Li ; Xi Fu ; Atsushi Shirane ; Hitoshi Kurosu ; Yoshinori Nakane ; Shunichiro Masaki ; Kenichi Okada

[A 3.2-GHz Quadrature Error Corrector for DRAM Transmitters, Using Replica Serializers and Pulse-Shrinking Delay Lines](#)

Hyeongjun Ko ; Changho Hyun ; Joo-Hyung Chae ; Gi-Moon Hong ; Suhwan Kim

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Simon Ooms ; Patrick Reynaert

[610-GHz Fourth Harmonic Signal Reactively Generated in a CMOS Voltage Controlled Oscillator Using Differentially Pumped Varactors](#)

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[An Implantable Body Channel Communication System With 3.7-pJ/b Reception and 34-pJ/b Transmission Efficiencies](#)

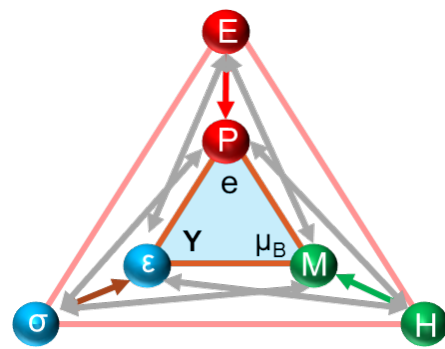
Beomjin Yuk ; Byeongseol Kim ; Sanggeon Park ; Yeowool Huh ; Joosung Bae

[Design of a Boost DC-DC Converter With 82-mV Startup Voltage and Fully Built-in Startup Circuits for Harvesting Thermoelectric Energy](#)

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[A 2T-MONOS Embedded Flash Macro With 65-nm SOTB Technology Achieving 0.15-pJ/bit Read Energy With 80-MHz Access for IoT Applications](#)

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Andrew W. Stephan ; Qiuwen Lou ; Michael T. Niemier ; Xiaobo Sharon Hu ; Steven J. Koester

Benchmarking Delay and Energy of Neural Inference Circuits

Dmitri E. Nikonov ; Ian A. Young

Energy-Efficient Convolutional Neural Network Based on Cellular Neural Network Using Beyond-CMOS Technologies

Chenyun Pan ; Qiuwen Lou ; Michael Niemier ; Sharon Hu ; Azad Naeemi

Ultracompact and Low-Power Logic Circuits via Workfunction Engineering

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Early Access Articles

Short-Term Long-Term Compute-In-Memory Architecture: A Hybrid Spin/CMOS Approach Supporting Intrinsic Consolidation

Shadi Sheikhfaal ; Ronald F. DeMara

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Shubham Sahay ; Mohammad Bavandpour ; Mohammad Reza Mahmoodi ; Dmitri Strukov

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