



IEEE
SOLID-STATE
CIRCUITS SOCIETY™
IC Innovation

June 2020

UPCOMING SSCS WEBINAR



Energy Efficient Nyquist-Rate ADCs

Presenter: Klaas Bult
Delft University of Technology, The Netherlands
Wednesday, June 24th, 2020
10:00 AM ET

Abstract: In large SoC's, data converters take a dominant position both from a performance point of view as well as from an energy consumption point of view. The past two decades have shown a strongly intensified search for more power efficient data converters, in particular power efficient ADCs. This presentation will focus on power efficiency of Nyquist-rate ADCs and discuss what has been proposed in open literature to reduce the energy consumption, both from a circuit point of view as well as from an architectural point of view. To get a good grasp of how circuit and architectural choices affect the power consumption, a method will be introduced that allows a quick estimation of the power consumption of an ADC, based on the required SNDR, the sampling frequency, the used technology as well as the chosen ADC architecture and circuit implementations. The proposed method enables a comparison based on these choices and can show what their impact is on the power efficiency, without going through the elaborate design of several architectures. It also shows which recent inventions made a large impact on power efficiency and how these inventions can also be of use in other architectures than the ones they have been introduced in.

Biography: Klaas Bult received an MSc. and a PhD. degree from Twente University in 1984 and 1988 respectively. From 1988 to 1994 he worked as a Research Scientist at Philips Research Labs, where he worked on Analog CMOS Building Blocks, mainly for application in Video and Audio Systems. In 1993-1994 he was also a part-time professor at Twente University. From 1994 to 1996 he was an associate professor at UCLA, where he worked on Analog and RF Circuits for Mixed-Signal Applications. In the same period he was also a consultant with Broadcom Corporation, in Los Angeles, CA and later in Irvine, CA, during which he started the Analog Design Group at Broadcom. In 1996 he joined Broadcom full-time as a Director, responsible for Analog and RF Circuits for embedded applications in broadband communication systems. In 1999 he became a Sr. Director and started Broadcom's Design Center in Bunnik, The Netherlands. In 2005 he was appointed Vice President and CTO of Central Engineering. As of 2016 he's an independent consultant Analog IC Design, operating from The Netherlands. Klaas Bult is an author of more than 60 international publications and holds more than 60 issued US patents. He is a Broadcom Fellow, an IEEE Fellow, was awarded the Lewis Winner Award for outstanding conference paper on ISSCC 1990, 1992 and 1997, was co-recipient of the Jan Van Vesseem best European Paper Award at ISSCC 2004 and the Distinguished paper Award of ISSCC 2014. He was also awarded the ISSCC Best Evening Panel Award in 1997 and 2006 and the Best Forum Speaker Award at ISSCC 2011. Klaas Bult has served more than 12 years on the ISSCC Technical Program Committee, 18 years on the ESSCIRC Technical Program Committee and 7 years as a member of the ESSCIRC/ESSDERC Steering Committee.

[CLICK HERE TO REGISTER](#)

NEWS

2020 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium

We invite you to join us in the 2020 IEEE Radio Frequency Integrated Circuits (RFIC) Symposium, to be held as a virtual symposium beginning on Tuesday 4 August 2020 with the plenary Session.

A single registration will allow attendees to access all Microwave Week content, including RFIC, IMS, ARFTG, the 5G Summit, a virtual exhibition, panel sessions, and more. This registration is free to all members of the IEEE Microwave Theory and Technique Society (MTTS). All Microwave Week content will be available on-line beginning on 4 August 2020 and lasting

through 30 September 2020.

Our technical program features 95 paper presentations organized within 21 technical sessions. These pre-recorded video presentation will be available to attendees on demand allowing attendees to digest all that our symposium has to offer.

A joint RFIC/IMS live-streamed panel session is scheduled for Wednesday, 5 August 2020 at 11:30 AM PDT. This panel will feature speakers discussing the important topic of "Who needs RF when we can digitize at the antenna interface". This topic is sure to interest both experts and newcomers alike. Finally, as students of today will be our leaders for tomorrow, the RFIC 2020, in partnership with IMS, offers opportunities for students to enhance their career growth and educational experiences. These include the RFIC student paper contest and the Three-Minute Thesis (3MT®) program.

On behalf of the RFIC Steering, Executive and Technical Committees, we welcome you to join us at the 2020 RFIC Symposium! Please visit the RFIC 2020 website (<http://rfic-ieee.org/>) for more details and updates.



SSCS Webinars for Young Excellence: Inaugural Webinar

Talk Title: The Intersection of SSCS and AI -- A Tale of Two Journeys

Abstract: Today's technology landscape is dominated by the inescapable excitement of applications and possibilities enabled by artificial intelligence (AI). The timing could not be riper given the availability of big data, sufficient computing capability, and new machine learning techniques. How can aspiring students and professionals both young and seasoned in the field of solid-state circuits get into the action? In this webinar, we will hear two distinguished professors in cutting-edge AI research -- Vivienne Sze of MIT and Boris Murmann of Stanford -- offer their personal stories, insights, and perspectives of how they see circuits applied to the AI realm. They will provide their views of what AI is and isn't, address the types of AI problems they seek to solve and the angle they apply to leverage their established design expertise. Profs. Sze and Murmann will also offer their projections on future research opportunities and advice on how one can prepare to intersect them.

The webinar recording is now available on the [SSCS Resource Center](#).

IEEE Xplore®
Digital Library

Stay Connected to IEEE Xplore When Working Remotely

If your organization has an institutional subscription to IEEE Xplore(R) and you need to work remotely due to school and workplace closures, you can still access

IEEE Xplore and continue your work and research while offsite. Try these [tips](#) for remote access or [contact IEEE](#) for help. IEEE is here to support you, making certain that your IEEE subscription continues to be accessible to all users so they can continue to work regardless of location.

Stay up-to-date with Learning with the SSCS Education Program



The [SSCS Education Program](#) provides Society members with free access to a wide range of quality educational content related to integrated circuits including tutorials, short courses, webinars, and eBooks.

- **Tutorials and Short Courses:** SSCS members have access to free tutorials and short courses from past years of ISSCC. Renowned experts in the field talk about new and ongoing developments in integrated circuits. [Click here to access.](#)
- **Webinars:** Monthly webinars are held for free for SSCS members on topics ranging from Analog/RF and future microprocessors to new biomedical applications. [Register for an upcoming webinar](#) or [view past webinars](#)
- **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.](#)

Educational credits (PDH's and CEU's) are available at a low cost for select products.

SSCS Educational content can be accessed via the [SSCS Resource Center](#) and the [SSCS YouTube Channel](#). The material is free for Society members.

EDUCATION

Upcoming 2020 Distinguished Lectures

SSCS Switzerland Virtual DL-Venumadhav Bhagavatula	Talk Title: Evolution of cellular RFICs (2G to 5G)	VIRTUAL - Click here for more information
SSCS San Diego Virtual DL-Tod Dickson	Talk Title: High-Speed CMOS Serial Transmitters for 56-112Gb/s Electrical Interconnects	VIRTUAL - Click here for more information
SSCS Israel Virtual DL-Patrick Mercier	Talk Title: Energy-Efficient Communication Technologies for Emerging Internet-of Things Applications	VIRTUAL - Click here for more information

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
--	--

<u>2020 International Symposium on VLSI Design, Automation, and Test (VLSI-DAT)</u> Hsinchu, Taiwan	Rescheduled to August 10th -13th, 2020
<u>2020 IEEE Radio Frequency Integrated Circuits Symposium (RFIC)</u> Los Angeles, California	Aug 4 - 6, 2020
<u>2020 European Solid-State Circuits Conference/2020 European Solid-State Device Research Conference</u> Grenoble, France	Rescheduled to September 2021. A new virtual educational event is currently being developed for September 14, 2020.
<u>2020 IEEE Biomedical Circuits and Systems Conference (BioCAS)</u> Berlin, Germany	Rescheduled for October 2021
<u>2020 IEEE BiCMOS and Compound Semiconductor Integrated Circuits and Technology Symposium (BCICTS)</u> Monterey, California	Nov 8 - 11, 2020
<u>2020 IEEE Asian Solid-State Circuits Conference (A-SSCC)</u> Hiroshima, Japan	Nov. 9 - 11, 2020

SSCS-Sponsored Conferences: Proceedings

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

2019

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

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

[2019 IEEE Symposium on VLSI Circuits](#)

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

[2019 IEEE Asian Solid-State Circuits Conference \(A-SSCC\)](#)

2020

[2020 IEEE International Solid-State Circuits Conference \(ISSCC\)](#)

[2020 IEEE Custom Integrated Circuits Conference \(CICC\)](#)

PUBLICATIONS

JxCDC Call for Papers: Special Topic on Tunneling FETs for Energy-Efficient Computing & Information Processing

A call for papers is now open for Special Topic on Tunneling FETs for Energy-Efficient Computing & Information Processing

Guest Editor:

Uygar Avci, Intel Corporation, uygar.e.avci@intel.com

Editor-in-Chief:

Aims and Scope:

The Tunneling Field-Effect Transistor (T-FET) is considered a future transistor option due to its steep-slope prospects and the resulting advantages in operating at low supply voltage (VDD).

Reducing supply voltage (VDD) while keeping a low leakage current and a reasonably high on-current is critical for minimizing energy consumption and improving the energy efficiency of computing and information processing. The thermal limit (Boltzmann's Tyranny) of the MOSFET transistor subthreshold swing (SS) restricts lowering its threshold voltage (V_t), causing significant performance degradation at low VDD. A Tunneling Field Effect Transistor's (T-FET) SS is not limited by this thermal tail and may perform better at low VDD. Since the first experimental proof of subthreshold swing (SS) < 60mV/dec, T-FET's prospects have attracted the interest of researchers. Silicon's large indirect bandgap and large carrier mass prevents Si T-FET from achieving high drive currents. But due to the availability of high-quality material together with years of know-how, Si and Si/Ge T-FETs have been studied initially, and showed the first of many devices with SS < 60mV/dec. III-V materials for T-FETs attracted attention next because of their low bandgap and carrier mass. While more challenging to fabricate, the broken bandgap hetero-junctions III-V T-FETs eventually showed the highest T-FET drive-current. Beyond III-V materials, Transition Metal Dichalcogenide and other 2D materials may provide a path in the future to high performance energy efficient transistors, thanks to thinner channels enabling better control of the tunneling field.

This call for papers on Tunneling FETs is for rapid publication of seminal results across the areas of T-FET materials, devices, and circuits for novel computation and information processing paradigms. Paper submissions with key insights into the advantages and challenges of specific T-FET device and material designs and circuit techniques are especially valued in order to guide the semiconductor industry and academia on a path toward more energy-efficient computing.

Topics of Interest:

Special Topic on Tunneling Field Effect Transistors (Tunneling FETs, T-FETs)

- N- and P- Tunneling FET experimental transistors demonstrating high performance at low supply voltage
- T-FET material and device design, including hetero-junction III-V materials, transition metal dichalcogenides, other two-dimensional materials and their hetero-junctions
- T-FET circuits for energy efficient computing and information processing
- Energy-Efficient computing and information processing with T-FET transistor circuits and architectures.

Important Dates:

Open for Submission: April 15th, 2020

Submission Deadline: June 30th, 2020

First Notification: August 1st, 2020

Revision Submission: August 21st, 2020

Final Decision: September 30th, 2020

Publication Online: December 1st, 2020

Submission Guidelines:

The IEEE Journal on Exploratory Solid-State Computational Devices and Circuits (JXCDC) IS AN OPEN ACCESS ONLY PUBLICATION:

Charge for Authors: \$1,350 USD per paper.

Paper submissions must be done through the ScholarOne Manuscripts website: <https://mc.manuscriptcentral.com/jxcdc>

Guidelines for papers and supplementary materials, as well as a paper template, are provided at this [website](#).

JxCDC is sponsored by:

- Solid-State Circuits Society
- Magnetics Society
- Circuits & Systems Society
- Computer Society
- Council on Electronic Design Automation
- Council on Superconductivity
- Nanotechnology Council
- Computer Society
- Electron Devices Society

[CLICK HERE TO BEGIN YOUR SUBMISSION](#)

The latest in SSCS Flagship Publications...



IEEE Journal of Solid-State Circuits

Vol. 55, Issue 5, May 2020

Special Issue on the 2019 RFIC Symposium

[Introduction to the Special Section on the 2019 RFIC Symposium](#)

Hongtao Xu

[Millimeter-Scale Node-to-Node Radio Using a Carrier Frequency-Interlocking IF Receiver for a Fully Integrated 4 × 4 × 4 mm³ Wireless Sensor Node](#)

Li-Xuan Chuo ; Zhen Feng ; Yejoong Kim ; Nikolaos Chiotellis ; Makoto Yasuda ; Satoru Miyoshi ; Masaru Kawaminami ; Anthony Grbic ; David Wentzloff ; David Blaauw ; Hun-Seok Kim

[A Fully Passive RF Front End With 13-dB Gain Exploiting Implicit Capacitive Stacking in a Bottom-Plate N-Path Filter/Mixer](#)

Vijaya Kumar Purushothaman ; Eric A. M. Klumperink ; Berta Trullas Clavera ; Bram Nauta

[An 802.11ba-Based Wake-Up Radio Receiver With Wi-Fi Transceiver Integration](#)

Renzhi Liu ; Asma Beevi K. T. ; Richard Dorrance ; Deepak Dasalukunte ; Vinod Kristem ; Mario A. Santana Lopez ; Alexander W. Min ; Shahrnaz Azizi ; Minyoung Park ; Brent R. Carlton

[Design and Analysis of Enhanced Mixer-First Receivers Achieving 40-dB/decade RF Selectivity](#)

Sashank Krishnamurthy ; Ali M. Niknejad

[A 24.5-43.5-GHz Ultra-Compact CMOS Receiver Front End With Calibration-Free Instantaneous Full-Band Image Rejection for Multiband 5G Massive MIMO](#)

Min-Yu Huang ; Taiyun Chi ; Sensen Li ; Tzu-Yuan Huang ; Hua Wang

[Multi-Mode 60-GHz Radar Transmitter SoC in 45-nm SOI CMOS](#)

Wooram Lee ; Tolga Dinc ; Alberto Valdes-Garcia

[A Code-Domain RF Signal Processing Front End With High Self-Interference Rejection and Power Handling for Simultaneous Transmit and Receive](#)

Hussam Alshammary ; Cameron Hill ; Ahmed Hamza ; James F. Buckwalter

[A Coupler-Based Differential mm-Wave Doherty Power Amplifier With Impedance Inverting and Scaling Baluns](#)

Huy Thong Nguyen ; Hua Wang

[A Wideband Low-Power Cryogenic CMOS Circulator for Quantum Applications](#)

Andrea Ruffino ; Yatao Peng ; Fabio Sebastiano ; Masoud Babaie ; Edoardo Charbon

[A 1.7-dB Minimum NF, 22-32-GHz Low-Noise Feedback Amplifier With Multistage Noise Matching in 22-nm FD-SOI CMOS](#)

Bolun Cui ; John R. Long

[A 39-GHz 64-Element Phased-Array Transceiver With Built-In Phase and Amplitude Calibrations for Large-Array 5G NR in 65-nm CMOS](#)

Yun Wang ; Rui Wu ; Jian Pang ; Dongwon You ; Ashbir Aviat Fadila ; Rattanan Saengchan ; Xi Fu ; Daiki Matsumoto ; Takeshi Nakamura ; Ryo Kubozoe ; Masaru Kawabuchi ; Bangan Liu ; Haosheng Zhang ; Junjun Qiu ; Hanli Liu ; Naoki Oshima ; Keiichi Motoi ; Shinichi Hori ; Kazuaki Kunihiro ; Tomoya Kaneko ; Atsushi Shirane ; Kenichi Okada

[Code-Domain Multiplexing for Shared IF/LO Interfaces in Millimeter-Wave MIMO Arrays](#)

Manoj Johnson ; Armagan Dascurcu ; Kai Zhan ; Arman Galioglu ; Naresh Kumar Adepu ; Sanket Jain ; Harish Krishnaswamy ; Arun S. Natarajan

[A 50-Gb/s PAM4 Si-Photonic Transmitter With Digital-Assisted Distributed Driver and Integrated CDR in 40-nm CMOS](#)

Qiwen Liao ; Nan Qi ; Miaofeng Li ; Shang Hu ; Jian He ; Bozhi Yin ; Jingbo Shi ; Jian Liu ; Patrick Yin Chiang ; Xi Xiao ; Nanjian Wu

[A 20-32-GHz Quadrature Digital Transmitter Using Synthesized Impedance Variation Compensation](#)

Huizhen Jenny Qian ; Yiyang Shu ; Jie Zhou ; Xun Luo

[Highly Integrated Guidewire Ultrasound Imaging System-on-a-Chip](#)

Jaemyung Lim ; Coskun Tekes ; Evren F. Arkan ; Ahmad Rezvanitabar ; F. Levent Degertekin ; Maysam Ghovanloo

[A High-Voltage Dual-Input Buck Converter Achieving 52.9% Maximum End-to-End Efficiency for Triboelectric Energy-Harvesting Applications](#)

Inho Park ; Junyoung Maeng ; Minseob Shim ; Junwon Jeong ; Chulwoo Kim

[An OTA-Less Second-Order VCO-Based CT \$\Delta\Sigma\$ Modulator Using an Inherent Passive Integrator and Capacitive Feedback](#)

Shaolan Li ; David Z. Pan ; Nan Sun

[A 102.2-dB, 181.1-dB FoM Extended Counting Analog-to-Digital Converter With Capacitor Scaling](#)

Saqib Mohamad ; Jie Yuan ; Amine Bermak

[An 8.2- \$\mu\$ W 0.14-mm² 16-Channel CDMA-Like Capacitance-to-Digital Converter](#)

Yuxuan Luo ; Yida Li ; Aaron Voon-Yew Thean ; Chun-Huat Heng

[A Time-Interleaved Resonant Voltage Mode Wireless Power Receiver With Delay-Based Tracking Loops for Implantable Medical Devices](#)

Se-Un Shin ; Minseong Choi ; Seungchul Jung ; Hyung-Min Lee ; Gyu-Hyeong Cho

[A Wireless Power and Data Transfer Receiver Achieving 75.4% Effective Power Conversion Efficiency and Supporting 0.1% Modulation Depth for ASK Demodulation](#)

Dawei Ye ; Yu Wang ; Yingfei Xiang ; Liangjian Lyu ; Hao Min ; C.-J. Richard Shi

[Mixer-First MIMO Receiver With Reconfigurable Multi-Port Decoupling and Matching](#)

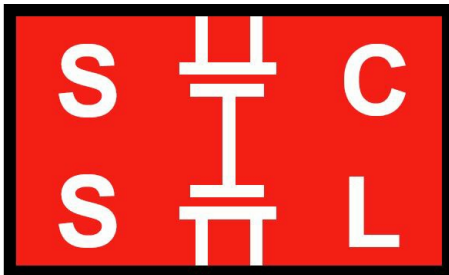
Charley Wilson ; Jacob Dean ; Brian A. Floyd

[A 30-GHz CMOS SOI Outphasing Power Amplifier With Current Mode Combining for High Backoff Efficiency and Constant Envelope Operation](#)

Kang Ning ; Yihao Fang ; Navid Hosseinzadeh ; James F. Buckwalter

[TG-SPP: A One-Transmission-Gate Short-Path Padding for Wide-Voltage-Range Resilient Circuits in 28-nm CMOS](#)

Weiwei Shan ; Wentao Dai ; Chuan Zhang ; Hao Cai ; Peiye Liu ; Jun Yang ; Longxing Shi



IEEE Solid-State Circuits Letters

Volume 3 - 2020

[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](#)

Hui Jiang ; Samira Amani ; Johan G. Vogel ; Saleh Heidary Shalmany ; Stoyan Nihtianov

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

Shihui Yin ; Jae-Sun Seo

[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](#)

Fatemeh Marefat ; Reza Erfani ; Pedram Mohseni

[Novel Pulse-Based Analog Divider With Digital Output](#)

Kuan-Hung Chen ; Tse-An Chen ; Chia-Ling Wei

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

Yi Fan Zhang ; Joshua Liang ; Shayan Shahramian ; Behzad Dehlaghi ; Ryan Besspalko ; Michael O'Farrel ; Dustin Dunwell ; Davide Tonietto ; Anthony Chan Carusone

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

Andres Quintero ; Cesare Buffa ; Carlos Perez ; Fernando Cardes ; Dietmar Straeussnigg ; Andreas Wiesbauer ; Luis Hernandez

[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

[Design and Packaging of a Robust 120-GHz OOK Receiver Used in a Short-Range Dielectric Fiber Link](#)

Simon Ooms ; Patrick Reynaert

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

Zhe Chen ; Zhiyu Chen ; Wooyeol Choi ; Kenneth K. O

[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](#)

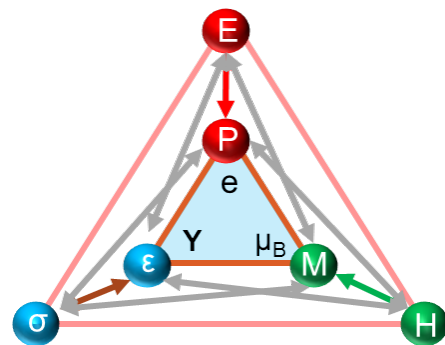
Jhe-Jia Jhang ; Hung-Hsien Wu ; Tien Hsu ; Chia-Ling Wei

[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](#)

Ken Matsubara ; Tsutomu Nagasawa ; Yoshinobu Kaneda ; Hidenori Mitani ; Takashi Iwase ; Yasunobu Aoki ; Kohei Hashimoto ; Toshiaki Morioka ; Keiichi Maekawa ; Takashi Ito ; Hiroyuki Kondo ; Takashi Kono

IEEE Journal on Exploratory Solid-State Computational Devices and Circuits

Volume 5: 2019 - December



[Nonvolatile Spintronic Memory Cells for Neural Networks](#)

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](#)

Talha F. Canan ; Savas Kaya ; Avinash Karanth ; Ahmed Louri

Early Access Articles

[Accurate Inference with Inaccurate RRAM Devices: A Joint Algorithm-Design Solution](#)

Gouranga Charan ; Abinash Mohanty ; Xiaocong Du ; Gokul Krishnan ; Rajiv V. Joshi ; Yu Cao

[A DNA Read Alignment Accelerator based on Computational RAM](#)

Zamshed I. Chowdhury ; Masoud Zabihi ; S. Karen Khatamifard ; Zhengyang Zhao ; Salonik Resch ; Meisam Razaviyayn ; Jian-Ping Wang ; Sachin S. Sapatnekar ; Ulya R. Karpuzcu

[Analyzing the Effects of Interconnect Parasitics in the STT CRAM In-memory Computational Platform](#)

Masoud Zabihi ; Arvind K. Sharma ; Meghna G. Mankalale ; Zamshed I. Chowdhury ; Zhengyang Zhao ; Salonik Resch ; Ulya R. Karpuzcu ; Jian-Ping Wang ; Sachin S.

Sapatnekar

[Short-Term Long-Term Compute-In-Memory Architecture: A Hybrid Spin/CMOS Approach Supporting Intrinsic Consolidation](#)

Shadi Sheikhaal ; Ronald F. DeMara

[Energy-Efficient Moderate Precision Time-Domain Mixed-Signal Vector-by-Matrix Multiplier Exploiting 1T-1R Arrays](#)

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

JxCDC papers listed in order of popularity can be found online [HERE](#).

For paper submission details, click [HERE](#).

For Society news and happenings, [check out](#) the Winter 2020 issue of the Solid-State Circuits Magazine.

You are receiving this email because you are an SSCS member and you indicated that you'd like to receive emails from IEEE in your IEEE member profile or you have chosen to subscribe to this e-newsletter. If you'd like to unsubscribe, please follow the "UNSUBSCRIBE" link below.

[CLICK HERE TO VISIT OUR WEBSITE](#)

CONNECT WITH SSCS:

