The ISSCC 2019 Conference Theme is “ENVISIONING THE FUTURE”

The relentless progress of solid-state circuits and systems has a profound impact on our daily lives, changing the way we work, communicate, and even socialize. The advancements in Silicon IC technology predicted by Moore's Law have been fueling this progress, but pursuing this trend further becomes increasingly more challenging from technology and economic perspectives. Stimulated by these difficulties, the solid-state circuit community is exploring a multiplicity of paths for further development: from novel technologies (innovative devices and integration techniques, such as qubits, spintronics, 3D, and photonic integration), to original approaches (such as Artificial Intelligence (AI) and Machine Learning (ML)), to new applications (such as wearable electronics, IoT, virtual reality, autonomous driving, robotics, and many more). It is difficult to clearly envision the way forward in this vibrant but complex emerging world: Thus, ISSCC 2019 is seeking innovations that will inspire the future of solid-state circuits and systems.

Innovative and original papers are solicited in subject areas including (but not limited to) the following:

**ANALOG:** Amplifiers, comparators, oscillators, filters, references; nonlinear analog circuits; digitally-assisted analog circuits; MEMS/sensor interface circuits.

**DATA CONVERTERS:** Nyquist-rate and oversampling A/D and D/A converters; embedded and application-specific A/D and D/A converters; analog to information conversion; time-to-digital converters.

**DIGITAL ARCHITECTURES & SYSTEMS:** Microprocessors, micro-controllers, application processors, graphics processors; digital systems for communications, video and multimedia, machine-learning, deep-learning, neuromorphism, cryptography, security and trusted computing, special-function acceleration, processing-in-memory; reconfigurable systems, near- and sub-threshold systems, digital architectures and systems for emerging applications (e.g. virtual reality – AR/VR and autonomous vehicles).

**DIGITAL CIRCUITS:** Building blocks for 2D/3D SoC such as intra-chip communication circuits, clock distribution techniques, soft-error and variation-tolerant circuits. Circuits for power management in digital applications: including voltage regulators, adaptive digital circuits, digital sensors; Near- and sub-threshold circuits; PLLs for digital clocking applications. Circuits for neuro-computing; Hardware security circuits including PUFs, TRNG, and attack-detection sensors.

**IMAGERS, MEMS, MEDICAL, & DISPLAY:** Image sensors and SoCs; automotive, LIDAR, and ultrasonic sensors; MEMS sensor systems; wearable, implantable, ingestible electronics, biomedical SoCs, neural interfaces and closed-loop systems; biosensors, microarrays, and lab-on-a-chip; display electronics, displays with sensing functionality; sensing for AR/VR.

**MEMORY:** Static, dynamic, and non-volatile memories for stand-alone and embedded applications; memory/SSD controllers; high-bandwidth I/O interfaces; memories based on phase-change, magnetic, spin-transfer-torque, ferroelectric, and resistive materials; array architectures and circuits to improve low-voltage operation, power reduction, reliability, and fault tolerance; memory-subsystem enhancements, including in-memory logic functions, machine learning, artificial intelligence, and AR/VR.

**POWER MANAGEMENT:** Power control and management circuits, regulators; switched-mode power converter ICs using inductive, capacitive, and hybrid techniques; energy-harvesting circuits and systems; wide-bandgap topologies and gate-drivers; power and signal isolators; circuits for lighting, wireless power.

**RF CIRCUITS and WIRELESS SYSTEMS**: Building blocks and complete solutions at RF, mm-Wave and THz frequencies for receivers, transmitters, frequency synthesizers, transceivers, SoCs, and SiPs. Innovative circuit-level and system-architecture solutions for established wireless standards and future systems or applications such as radar, sensing, and imaging.

**TECHNOLOGY DIRECTIONS:** Emerging IC and system solutions for: biomedical, sensor interfaces, analog signal processing, power management, computation, data storage, and communication; analog/mixed-signal techniques for security and machine learning; non-silicon-, carbon-, organic-, metal-oxide-, compound-semiconductor- and new-device-based circuits; nano, flexible, large-area, stretchable, printable, quantum, optical, and 3D-integrated electronics; spintronics.

**WIRELINE:** Receivers/transmitters/transceivers for wireline systems, including backplane transceivers, optical links, chip-to-chip communications, 2.5/3D interconnect, copper-cable links, and equalizing on-chip links; exploratory I/O circuits for advancing data rates, power efficiency, and equalization; wireline transceiver building blocks (such as AGCs, front ends, equalizers, clock-generation and distribution circuits including PLLs, clock-and-data recovery, line drivers, and hybrids).

*Papers submitted to this category will be reviewed by either the RF or Wireless Subcommittee.*
ISSCC 2019 will host an Industry Showcase Evening Session. The goal of this event is to highlight the role of solid-state circuits and systems-on-chip (SoCs) in the creation of novel products. It will feature short presentations, as well as interactive demonstrations where attendees can have a hands-on experience with each featured innovation. The outstanding demonstration(s) will be recognized at next-year’s Conference. To be considered for participation in the Industry Showcase, proposals consisting of a one-page description of the potential demonstration, including a maximum of two illustrative figures, must be uploaded to the ISSCC submission website (https://submissions.mirasmart.com/ISSCC2019). Firm deadline for electronic submission is Monday, September 10, 2018, 3:00PM Eastern Daylight Time (19:00 GMT). Only proposals with an industrial affiliation will be considered. Feedback on the proposals will be given by October 31, 2018. Refer to the ISSCC Website for further information (http://isscc.org).

INDUSTRY SHOWCASE

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STUDENT ACTIVITIES

Student-Research Preview (SRP): This session provides students with the opportunity to showcase the directions of their work, and to exchange experiences with other students and researchers from academia and industry. SRP is organized as an Evening Session consisting of short presentations of work-in-progress followed by a poster session. Outstanding poster presentation(s) will be recognized at next-year’s Conference. The abstract submission deadline for SRP is October 25, 2018. Refer to the ISSCC Website for further information.

Student Travel Grant Awards: Students who are members of the Solid-State Circuits Society and in a PhD program can apply for partial travel support to attend ISSCC. Visit the SSCS website https://sscs.ieee.org/about/awards for more information.

Silkroad Award: The winner(s) are selected from first-time student-presenting authors at ISSCC whose research is conducted in an emerging region in the Far East.

DEMONSTRATION SESSIONS:

Authors of regular papers are eligible for consideration for Demonstration Sessions. The demonstrations will be held during the Conference social hours on Monday and Tuesday. At these sessions, authors of selected papers will employ posters to augment their demonstration. The outstanding demonstration(s) will be recognized at next-year’s Conference. To be considered for participation in the Demonstration Sessions, authors, at the time of paper submission, must submit a one-page description of their potential demonstration, which can include an additional illustrative figure. Refer to the ISSCC Website for further information (http://isscc.org).

ELECTRONIC SUBMISSION OF ABSTRACT, DRAFT MANUSCRIPT, AND PRE-PUBLICATION MATERIAL:

Authors should submit 2 items for review: 1) An informative and quantitative Abstract; 2) A Draft Manuscript including figures for the Digest of Technical Papers. Be sure to read the Pre-Publication Guidelines (summarized below) carefully! The Submissions Website will be available starting July 1, 2018. You may consult the Website for instructions at any time after this date. To submit a paper, go to: https://submissions.mirasmart.com/ISSCC2019 to upload the manuscript and provide the requested additional information. Abstract and manuscript must be submitted by September 10, 2018. During the submission process you will be asked for a suggested subject area, however this subject area may be changed by the ISSCC organization to streamline the review process. A sample abstract and draft Digest paper can be found at the ISSCC Website (single-column double-spaced format is required for the paper-review process).

ADDITIONAL SUBMISSION DETAILS:

1. The Abstract must be uploaded to the Submissions Website. It must not exceed 500 characters (including spaces). The Abstract must be factual and provide as complete and quantitative a description as possible, including specific and concrete performance data. Claims such as “new”, “advanced”, “novel”, “high-performance”, and “high-speed” are NOT acceptable! Please refer to the sample abstract on the ISSCC Website. Note that ISSCC reserves the right to modify the paper title and abstract when technically appropriate.
The Conference Pre-Publication Policy:

As the premier global forum for the debut of technical innovations in integrated circuits and systems, ISSCC cannot accept papers whose key innovative ideas and results have already been disclosed to the public. To assess the novelty of a paper, the program committee evaluates its content against all background or baseline information that was provided under NDA to customers, partners, or other parties. In addition, up to 3 optional supplementary figures can be included for review purposes. We strongly encourage you to include a comparison table as one of the figures. The manuscript text must contain all essential information, including relevant references. Papers exceeding the length limit will be immediately rejected, as required by length editing. Complex multipart figures are not allowed (for example, Figures 2a and 2b will be counted as two figures!). Tables count, and are labeled, as figures. If a die-photo and/or comparison table is available, they can be included as part of the 7-figure limit. Supplementary figures will NOT be part of the final manuscript, and should NOT be referred to in the text of the paper, but serve ONLY as additional material for the reviewers. These 3 figures should be described with no more than 4 sentences in their captions with figures labeled as “Fig. S1, S2, S3”. For further details, see the ISSCC Website.

3. Double-Blind Review. The paper selection will follow a double-blind review process, meaning that both the authors and reviewers will remain anonymous during the paper selection process. All authors MUST adhere to the following guidelines to conceal their identity: (1) Eliminate names, contact information, and affiliations from the entire manuscript (including PDF metadata, logos on die photos, logos on printed circuit board photos, etc.). (2) Cite all relevant prior work (including your own) in the third person (for example, “It has been shown that… [1]”; do not use the words “my” or “our”). Work that is substantially related to the submission and has been submitted to another Conference/Journal, but has not been published yet, must be cited in an anonymized format* and must be uploaded as supplementary material. Supplementary material does not need to be anonymous, as it will be checked only after paper selection. Do not cite patents. (3) Eliminate acknowledgments and references to funding sources. (4) Do not contact the program committee members to solicit input on your manuscript. The identity of authors is only known to the program chair/vice-chair and the subcommittee chairs; you may contact them for questions. Manuscripts that are not properly anonymized cannot be considered for review; to ensure your submission complies with these rules please review carefully the sample manuscript, the FAQ on Double-Blind Review, and the guidelines on how to write a good submission at the ISSCC Website. The review process will include a software-based plagiarism check. After paper selection, a final pre-publication check (using the authors’ names) is applied using the guidelines summarized below. ISSCC may withdraw any paper that violates the pre-publication guidelines.

The most common reason for paper rejection is a lack of clear evidence of what is novel in the work, and the extent to which it advances the state-of-the-art. Successful submissions contain specific new results, sufficient detail and data to be understood technically, circuit schematics, measured results for key elements, and tabulated comparisons with recently-published work, where appropriate.

For further details on manuscript preparation, check the ISSCC Website: http://isscc.org, or send an email with your questions to the Director of Publications: Laura Fujino, Email: lcfujino@aol.com. All information regarding submission is also available at the Submissions Website (https://submissions.mirasmart.com/ISSCC2019).

Notification of Acceptance: Authors will be notified of acceptance by October 19, 2018. A submission may be accepted as either a regular or short paper. A regular paper is allowed 30 minutes (23 minutes presentation time). A short paper is allowed 15 minutes (12 minutes presentation time). Regular and short papers must meet the same submission and quality standards. They differ only in the determination by the Program Committee of the time required to present their key ideas.

Authors of accepted papers will have an opportunity to modify their manuscript. All information removed/anonymized following the Double-Blind Review guidelines (logo on-die photo, etc.) may be added back to the final paper upon acceptance. The Program Committee may require specific additional revisions. There will be further formatting requirements for the final Digest manuscript. The presenting author is required to register for the Conference in advance.

The Conference Pre-Publication Policy: As the premier global forum for the debut of technical innovations in integrated circuits and systems, ISSCC cannot accept papers whose key innovative ideas and results have already been disclosed to the public. To assess the novelty of a paper, the program committee evaluates its content against all background or baseline information that was pre-published by the authors. Disclosures considered as pre-publication include: (1) Publicly available data in articles, manuals, data sheets, trade journals, application notes, other conferences, and press releases, which contain substantial technical information such as schematics, principles of operation, architectures, and algorithms. (2) Some previously publicly copyrighted material, such as in an IEEE publication. (3) Material submitted for which publication decision is still pending. (4) Material accepted for publication elsewhere. (5) Material available on a public website at any time up to the first day of the next ISSCC. Disclosures not considered pre-publication include: (1) Some situations in which a product has entered production, has been sampled, and/or has appeared in a publication under restricted conditions, with no technical description, as noted below. (2) Preliminary data sheet(s)/product announcement(s) and die photos without technical details. (3) Presentation at a limited-attendance workshop with no proceedings, nor press coverage, and no public online access (such as, a presentation to research sponsors). (4) Information provided under NDA to customers, partners, or other parties. (5) Final signed versions of Master's and PhD theses available in open access repositories (libraries), either printed or online. (But, a thesis published for profit is considered prepublication.) (6) Published patents and patent applications. Authors must disclose all material that may fall into the pre-publication category as part of the submission process.

For further details on Pre-Publication Policy, Double-Blind Review or assistance in assigning a subject area, contact the Program Chair: Eugenio Cantatore, Tel: +31 40-247-3388, Email: e.cantatore@tue.nl
ISSCC 2019
SUNDAY-THURSDAY — FEBRUARY 17-21, 2019
SAN FRANCISCO MARRIOTT MARQUIS HOTEL, SAN FRANCISCO, CA

Firm Deadline for Electronic Submission of Proposals for the Industry Showcase:
Monday, September 10, 2018 • 3:00PM Eastern Daylight Time (19:00 GMT)

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PLEASE CIRCULATE/POST ON BULLETIN BOARDS
SAN FRANCISCO MARRIOTT MARQUIS, SAN FRANCISCO, CA / FEBRUARY 17-21, 2019

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