

November 14 - 16, 2017, Montreal, Canada

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Symposium on Stochastic and Approximate Computing for Signal Processing and Machine Learning

Call for Papers

General Chair:
Warren Gross, McGill University

Technical Co-Chairs:
Vincent Gaudet, University of Waterloo
Jie Han, University of Alberta

Stochastic computing (SC) was first introduced in the 1960s for logic circuit design, but its origin can be traced back to von Neumann's work on probabilistic logic. In SC, real numbers are encoded by random binary bit streams, and information is carried on the statistics of the binary streams. SC offers advantages such as hardware simplicity and fault tolerance. Its promise in data processing has been shown in applications including neural computation, decoding of error-correcting codes, image processing, spectral transforms and reliability analysis. As a different paradigm, approximate computing (AC) employs design methodologies that exploit the notion that many systems and applications can tolerate some loss of accuracy in the computation result. Such applications include signal processing, recognition, search, data mining and machine learning. AC leverages the unique feature of error resilience in these applications and searches for solutions that allow computing systems to trade quality for energy. AC spans a wide range of research activities from circuits to programming languages. It includes arithmetic circuit design at the transistor and logic levels, approximate memory and storage (including SRAM, DRAM and non-volatile memories), and various approximate processor architectures (including neural networks, general-purpose and reconfigurable processors, graphic processing units, and FPGAs). SC and AC are interrelated disciplines that have recently become very active due in part to their applicability to nanoscale electronics technology.

Topics of interest include but are not limited to:

- Circuit design, modeling and analysis
- System and architectural considerations
- Cross-layer design and evaluation methodologies
- Stochastic/Approximate computing for signal processing
- Stochastic/Approximate computing for machine learning
- Stochastic/Approximate computing for emerging and post-CMOS technologies
- Emerging applications

Paper Submission: Prospective authors are invited to submit full-length papers (up to 4 pages for technical content including figures and possible references, and with one additional optional 5th page containing only references) or extended abstracts (up to 2 pages), for paper-less industry presentations and Ongoing Work presentations) via the GlobalSIP 2017 conference website. Manuscripts should be original (not submitted/published anywhere else) and written in accordance with the standard IEEE double-column paper template. Accepted full-length papers will be indexed on IEEE Xplore. Accepted abstracts will not be indexed in IEEE Xplore, however the abstracts and/or the presentations will be included in the IEEE SPS SigPort. Accepted papers and abstracts will be scheduled in lecture and poster sessions.

Important Dates:

- ❖ **May 15, 2017:** Paper submission due
- ❖ **June 30, 2017:** Notification of Acceptance
- ❖ **July 22, 2017:** Camera-ready papers due

For inquiries please contact: Vincent Gaudet (vcgaudet@uwaterloo.ca), Warren Gross (warren.gross@mcgill.ca), or Jie Han (jhan8@ualberta.ca).