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Approximate and Stochastic Computing Circuits, Systems and Algorithms
IEEE Transactions on Emerging Topics in Computing
Special Issue/Section
Third Issue of 2016


The last decade has seen renewed interest in non-traditional computing paradigms. Several (re-)emerging paradigms are aimed at leveraging the error resiliency of many systems by releasing the strict requirement of exactness in computing. This special issue of TETC focuses on two specific lines of research, known as approximate and stochastic computing.

Approximate computing is driven by considerations of energy efficiency. Applications such as multimedia, recognition, and data mining are inherently error-tolerant and do not require perfect accuracy in computation. The results of signal processing algorithms used in image and video processing are ultimately left to human perception. Therefore, strict exactness may not be required and an imprecise result may suffice. In these applications, approximate circuits aim to improve energy-efficiency by maximally exploiting the tolerable loss of accuracy and trading it for energy and area savings.

Stochastic computing is a paradigm that achieves fault-tolerance and area savings through randomness. Information is represented by random binary bit streams, where the signal value is encoded by the probability of obtaining a one versus a zero. The approach is applicable for data intensive applications such as signal processing where small fluctuations can be tolerated but large errors are catastrophic. In such contexts, it offers savings in computational resources and provides tolerance to errors. This fault tolerance scales gracefully to high error rates.

The focus of this special issue will be on the novel design and analysis of approximate and stochastic computing circuits, systems, algorithms and applications. Topics of interest include, but are not limited to:

- Approximate circuit design using CMOS and emerging nanoscale technologies
- Stochastic computing circuit design and analysis
- Approximate and stochastic computational systems and applications
- Theory and error tolerance analysis for approximate and stochastic computing
- Novel hardware implementations for approximate and stochastic computing
- Other topics related to approximate and stochastic computing

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Please note the following important dates.

- Submission Deadline: September 1, 2015
- Reviews Completed: December 1, 2015
- Major Revisions Due (if Needed): January 1, 2016
- Reviews of Revisions Completed (if Needed): February 1, 2016
- Minor Revisions Due (if Needed): March 1, 2016
- Notification of Final Acceptance: May 1, 2016
- Publication Materials for Final Manuscripts Due: June 1, 2016
- Publication date: Third Issue of 2016 (September Issue)

Please address all other correspondence regarding this special issue to the Guest Editors:

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