



Call for Papers

Special Issue on Computational Structures and Methods with Memristive Devices and Systems



Aims and Scope

Emerging chip technologies that utilize novel devices and materials are becoming attractive alternatives to the conventional CMOS technology, which is challenged by technological and physical limits. Moving beyond today's silicon integrated chip technology requires the shrinking of circuits to the scale of a few nanometers. Novel devices and architectures will likely be needed to satisfy the growing demands for high performance electronic applications.

One of the emerging nanoscale devices is the *memristor*, which is a nonvolatile, two-terminal, and programmable resistive device. The identification of Chua's memristor in 2008 by HP Labs has resulted into an intense research activity in the field, and it has been found that memristors allow for circuits that are conventionally inefficient, or even impossible, to realize. Proposed memristive computing systems range from memory and reconfigurable logic to neuromorphic engineering. New design methodologies for analog and digital circuits are required, as the computing systems comprise of active CMOS circuitry interfaced with passive memristive devices. Being nonvolatile nanoscale memory devices, memristors can be used to improve the performance of existing computational structures, but it is equally important to study new computational paradigms and methods that exploit the unique features of these novel electronic devices.

In connection with the ICECS 2013 Special Session on Memristor Devices and logic, held in Abu Dhabi, UAE on December 8-12, 2013, we invite submissions for a Special Issue of *Microelectronic Journal* on **Computational Structures and Methods with Memristive Devices and Systems**. This Special Issue addresses computational structures and methodologies that use the memristor as a fundamental computational primitive. In such innovative circuit architectures with memristive elements, computing and storing of information is performed on the same physical platform. The Special Issue contributes to the design of memristor-based computational system including digital, analog, chaotic, and neuromorphic systems. The presented works, exploiting the favorable performance merits of memristors, concerning their non-volatility, switching speed, area and energy dissipation, may be promising candidates to be used in future electronic systems design.

Tentative authors are invited to submit original unpublished works on topics from a wide range of computational methods, including but not limited to the following:

- Analog, digital, and neuromorphic computational paradigms
- Massively parallel reconfigurable memristive architectures
- Biologically inspired memristive systems
- Memristor-based logic circuits and architectures
- Solving optimization problems with memristors
- Novel computational platforms and architectures accommodating memristive circuits and systems

Paper Submission

Papers submitted to this special issue for possible publication in *Microelectronics Journal* must be original and must not be under consideration for publication in any other journal or conference. Previously published or accepted conference/workshop papers must contain at least 40% new material to be considered for the special issue. All papers are to be submitted by referring to <http://ees.elsevier.com/mej>. During submission please select paper type "Special Issue:Memristors" under Manuscript Category. All manuscripts must be prepared according to the journal publication guidelines which can also be found on the website provided above. Papers will be reviewed following the journal standard review process.

Important Dates

Submission: 15h February 2014
First Notification: 15st April 2014
Revision Submission: 1st June 2014
Second Notification: 1st July 2014
Final version Submission: 31st July 2014

Guest Editors

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