

IEEE JOURNAL ON EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS

CALL for PAPERS

Emerging Memories - Technology, Architecture & Applications

Guest Editors

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Scope and Purpose

Conventional embedded memory i.e., Static Random Access Memory (SRAM) is facing a scalability challenge due to process variability and leakage power. Off-chip memory e.g., Dynamic Random Access Memory (DRAM) suffers from standby power and bandwidth limitations. To cater to emerging energy-constrained and bandwidth hungry electronic gadgets there is crucial need to investigate emerging memory technologies at every level of memory hierarchy. Designing systems using emerging memories requires innovations in technology, manufacturing, circuits, micro-architecture, systems and applications. The true benefit is gained by exploiting the unique characteristics of new memory technologies to achieve density, robustness, energy-efficiency and performance.

This special issue will cover the latest trends in embedded as well as standalone memory design from technology all the way to applications. In particular, following aspects of the emerging memories will be explored: (i) novel high-density emerging memory technologies e.g., spintronic memories, Resistive RAM and phase change memory; (ii) novel circuit, micro-architecture and architectural innovations to solve robustness, reliability and energy-efficiency challenges of these emerging memory technologies; (iii) cross-layer design methodologies to enable seamless integration and address robustness, reliability and energy efficiency; (iv) novel design methodologies and tools; and (v) new applications of memories beyond data storage e.g., signal processing, security, non-Boolean computations. The special session will be structured in three sections: technology, architecture and application. Each section will be headed by corresponding invited papers from world-wide recognized experts.

Topics of interest

Innovative ideas and novel methodologies, both theoretical and experimental, are sought in the areas of interests including but not limited to:

- Nano-materials and fabrication technologies for emerging memories including but not limited to:
 - Spintronic memories
 - Resistive RAM
 - Phase change memory and
 - Ferroelectric RAM.
- Memories using alternative devices (e.g., carbon-nanotube, tunnel FETs) and new materials.
- Planar memories designed using 2.5D or 3D hybrid nano-architectures.
- Modeling and analysis of Beyond-CMOS memory technologies.
- Innovative circuits to improve key design metrics such as density, robustness, energy-efficiency or performance.
- Cross-layer design methodologies for robustness, energy-efficiency and performance.
- New application areas and memory hierarchies enabled by emerging memories, e.g., for exascale high-performance computing (HPC), cloud workloads, and mobile applications.

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Important dates

- Manuscript submissions due **2015-06-30**
- First round of reviews completed **2015-09-15**
- Revised manuscripts due **2015-11-01**
- Second round of reviews completed **2015-12-01**
- Final manuscripts due **2016-01-15**

Request for information

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