

IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS II: EXPRESS BRIEFS

CALL FOR PAPERS

Special Issue on

CIRCUITS AND SYSTEMS FOR ENERGY-AUTONOMOUS MICROSYSTEMS

Wireless sensing is one of the major emerging applications for integrated circuits today, and with it comes a need for ultra-low power circuit design techniques. In particular, progress is required at both the component (e.g., wakeup radios, nW-level timers, efficient low-load DC-DC conversion) and system (ex: complete demonstrations of nW to μ W range systems including energy harvesting) levels. Of particular interest is cost-effective harvesting microsystems that achieve energy autonomy, which eliminates the need to change batteries and/or extends lifetime indefinitely. Power management in such systems, with very low load currents and a variety of power sources, is a major challenge. Handling uncertainty in the energy budget of the system is another new challenge. Finally, coping with variability at all levels (ranging from memory bitcells up to communication synchronization) without incurring undue overhead is a difficult requirement to meet. This Special Issue will have particular emphasis on realizing complete microsystems in the ultra-low power regime.

This Special Issue on *Circuits and Systems for Energy-Autonomous Microsystems* calls for contributions in the following areas:

- Ultra-low power circuit building blocks suitable for wireless sensing microsystems
- Energy harvesting schemes and power management for very low power microsystems
- New communication schemes that reduce average energy consumption (e.g., optical)
- Microsystem design using non-traditional devices and/or substrates (e.g., organic, flexible, CMOS-MEMS co-integration, etc.)
- Memory architectures aimed at ultra-low power operation including new embedded non-volatile memory types
- Lightweight variation-tolerant design techniques to enable low voltage operation without excessive guardbanding
- Analyses and demonstrations of wide operating range (PVT) ultra-low power circuits and systems
- Microsystem demonstrations for applications of interest in wireless sensing (examples include biomedical, environmental sensing, infrastructure monitoring, surveillance)
- Modeling and analysis frameworks highlighting system-level design choices

Submission Guidelines: All submitted manuscripts must (i) conform to TCAS II's normal formatting requirements and page-count limits (at no more than 5 pages); (ii) incorporate no less than 60% of new (previously unpublished) material; (iii) validate principal claims with experimental results and all secondary, difficult-to-test claims with simulations; and (iv) be submitted on line at <http://tcas2.polito.it/Forms/Authors/index.html>. Please note that you need to select "Special Issue Circuits and Systems Energy-Autonomous Microsystems" when you submit a paper to this Special Issue.

Timeline and Review Process: The tentative publication date for this Special Issue is October of 2013. Prospective authors must submit their manuscripts by no later than April 1, 2013. Once submitted, manuscripts will undergo IEEE's standard peer-review process for TCAS II by ~~June 3, 2013~~ June 26, 2013. Authors must subsequently submit revised manuscripts no later than ~~June 24, 2013~~ July 17, 2013.

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