

Advanced Radio Access Techniques for Energy-Efficient Communications

Special session (half day) about energy aspects of wireless communication systems

Motivation and Scope

Energy-efficiency is one of the key aspects for the next generation radio access technologies used for short and long-range wireless communications. Current wireless standards use sophisticated signal processing techniques that imply more dissipated power and higher costs. As an example, MIMO (multiple-input multiple-output) techniques typically require complex RF transceivers and large amount of signal processing that lead to increased power consumption and large system sizes. These reasons have delayed the wide scale commercial deployment of multi-antenna wireless transceivers in low-cost terminals, such as those required for handheld cellular phones, WLAN or WPAN systems. These aspects are even more challenging for other energy-constrained applications such as those encountered in WSNs (wireless sensor networks) and RFID systems, for which existing multi-antenna techniques might not be realistic.

One way of achieving this energy efficiency is to use synergies in the signal paths and to process the signals directly in the radio-frequency domain. Other techniques that have been proposed to reduce the system costs or simplify the circuitry required by MIMO, are pre-FFT techniques or equal-gain combining techniques. All these techniques effectively reduce the number of processed signal dimensions. Also, the use of cooperation among single-antenna nodes is another way of achieving important energy savings, while still exploiting spatial diversity and other benefits of multi-antenna terminals.

Under the auspices of the MIMAX project, the goal of this special session is to present recent developments in the topic of energy-efficient radio access techniques, covering the different aspects involved in the problem (e.g., RF circuitry, baseband, MAC and cross-layer processing) and exploring the tradeoffs involved. We will pay particular attention to the problem of energy-efficient radio access techniques covering signal processing and hardware architectures.

Papers, which related but not limited to,

- Simplified architectures for energy-efficient MIMO transceivers: RF-MIMO, equal-gain MIMO beamforming or equal-amplitude MIMO beamforming
- Cross-layer designs for energy-efficient transmissions
- Energy-efficient transmission techniques in RFID systems and WSNs
- Energy-efficiency through distributed MIMO and cooperative techniques

are expected for submission.

Important dates:

<i>Paper submission deadline</i>	<i>January 15, 2010</i>
<i>Notification of Acceptance</i>	<i>February 15, 2010</i>
<i>Final paper</i>	<i>March 15, 2010</i>

The papers should be submitted electronically in PDF format and using the MOBILIGHT paper template, through the MOBILIGHT webpage (www.mobilight.org/) following the instructions given in the Submission Guidelines section.

Accepted papers will be published by Springer in the MOBILIGHT Conference Proceedings and made available online through Springer Lecture Notes of ICST (LNICST).

Note: Papers submitted to each workshop should be original and peer reviewed by the program committee and external reviewers. An accepted paper must be registered and presented at the workshop venue.

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