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Circuits, Systems and Signal Processing

Special Issue on Embedded Signal Processing Circuits and Systems for Cognitive Radio-based Wireless Communication Devices

The demand for ubiquitous wireless services is ever-growing, and with the proliferation of mobile multimedia communication devices and wireless standards, it will continue to grow. Future communication devices have to support a plurality of applications such as text, speech, audio, video, and graphics. Apart from that, they also should be able to connect with many other devices operating on different standards. It has been observed that most of the licensed spectrum is largely underutilized, and similar views about the underutilization of the allocated spectrum have been reported by the Spectrum Policy Task Force appointed by the Federal Communications Commission (FCC). Motivated by this, new insights on cognitive radios have challenged the traditional static allocation approach to spectrum management. Cognitive Radio (CR), built on a Software-Defined Radio (SDR) platform is emerging as an environment-aware intelligent wireless communication system. It uses the methodology of understanding-by-building to learn from the environment and is able to adapt to statistical variations in the input stimuli, with the objective of achieving highly reliable communication at any time and any where.

The main focus of this special issue is the research challenges relating to the design and realization of embedded signal processing circuits and systems for resource-constrained cognitive radios. The topics to be covered include, but are not limited to:

- RF direct sampling and bandpass sampling
- Adaptive ADCs and DACs
- Analog, mixed-signal, and RF integrated circuits for transceivers
- Wide-band and multi-band transceiver circuits
- System on Chips for multi-standard communication
- Reconfigurable RF front-end circuits
- Reconfigurable signal processing architectures
- Low-power designs
- Programmable sample-rate conversion techniques
- Advanced spectrum sensing circuits
- Channel adaptation architectures
- Coding and modulation circuits
- Software defined radio circuits
- Reconfiguration management
- Cognitive cycle management
- Context-aware terminals
- Multi-user spectrum access
- Cognitive radio prototypes and test beds

Contributions to this Special Issue should be emailed to Guest Editors, Dr. Vinod Prasad (asvinod@ntu.edu.sg) and Dr. Pramod Kumar Meher (pkmeher@i2r.a-star.edu.sg) in PDF format with subject "Special Issue on Cognitive Radio Circuits and Systems". The manuscripts will undergo a standard review process. All manuscripts should conform to the standard format as indicated in the "Instructions for Authors" available at URL: <http://www.springer.com/journal/00034/submission>

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