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Guest Editorial

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With the growing presence of analog and mixed-signal blocks in SoC designs, test and validation cost and quality of mixed-signal circuits are taking the spotlight within the semiconductor industry. This is compounded by the fact that recent innovations in digital test have dramatically reduced the cost of testing digital blocks while analog and mixed-signal blocks are still being tested using brute force methods resulting in a growing contribution of analog test cost to the overall SoC test cost. It is therefore imperative for the industry to rapidly advance analog test and characterization to the same level of efficiency as their digital counterparts in order to effectively manage the test cost and quality of mixed signal SoCs. Also, the accelerated developments in heterogeneous system design and manufacturing makes test and DFT of today's sensor-based systems and related devices and systems a critical issue to address.

This special issue concentrates on new research and development in analog, mixed-signal and RF testing, as well as test of heterogeneous sensors and systems. It includes 12 excellent papers from academia and industry. Most of these papers are extended versions of the preliminary work presented at the 15th IEEE International Mixed-Signals, Sensors and Systems Test Workshop, held in Scottsdale, Arizona, 10–12 June 2009. The selected papers are grouped in three sections and deal with RF test, analog and mixed-signal test, and system and sensor test. RF test papers address general RF DFT guidelines, oscillation-based test applied to RF blocks, power amplifier non-linearity estimation and fault coverage analysis of RF sensor-based BIST techniques. Analog and mixed-signal test papers cover crucial topics of ADC test using simplified histogram method, test time reduction of digitally-calibrated mixed-signal designs, enhancements to loopback test of mixed-signal circuits, circuit techniques to generate 20 Gbps test signals, and estimation of noise impact on design and test of analog circuits. Finally, system and sensor test papers focus on accelerometer MEMS test and calibration, wireless multi-sensor platform test, and test of impedance analysis systems.

We would like to thank all authors and reviewers for their valuable contribution to this special issue which will be a valuable resource for researchers and developers in this field. Special thanks are due to the Editor-in-Chief for dedicating a special issue to this important topic and the Editorial Staff for working tirelessly on the production of this issue.

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