

Editorial

This issue puts together papers from two Conferences held in late 2000: the 'Design, Modeling and Simulation in Microelectronics and MEMS' Conference, that was part of the International Symposium on Microelectronics and Assembly held in Singapore, 27 November to 1 December 2000, and the 'Smart Electronics and MEMS' Conference, that was part of the Smart Materials and MEMS International Symposium held in Melbourne, Australia, 13 to 15 December 2000.

In the 'Design, Modeling and Simulation in Microelectronics and MEMS' Conference, the four first papers 'Micro coil modeling — benefit and implementation of a permeable layer', 'Modeling and designing quadratic membrane structures', 'Design considerations in micromachined silicon microphones', 'A modular approach for simulation-based optimization of MEMS', are dealing with MEMS components, addressing various issues in designing these components. These papers deal with microcoil, membrane structures and microphone design and modeling, while the fourth one addresses simulation and optimization algorithms for a MEMS design flow.

The next two papers 'Characterization and modeling of avalanche multiplication in HBTs', 'SiGe HBTs model converting technique from SGP to VBIC model' were part of the Device Modeling session. They both address HBTs.

Technology CAD is the subject of two papers 'Steep retrograde indium channel profiling for high performance nMOSFETs device fabrication', 'An extensible TCAD optimization framework combining gradient based and genetic optimizers', one addressing MOSFET device fabrication, the other one addressing a framework for optimization and modeling of semiconductor devices.

The three last papers 'A novel circuit concept for PSK-demodulation in passive telemetric systems', 'Pipelining flat CORDIC based trigonometric function generators', 'Timing and power measurement in static software analysis' address successively a circuit for PSK-demodulation aimed at energy and data transmission, CORDIC function generators and finally timing and power measurements in embedded software.

In the 'Smart Electronics and MEMS' Conference, the first three papers, 'SU8 resist for low-cost X-ray patterning of high-resolution, high-aspect-ratio MEMS', 'Micro-sensor clusters' and 'Probing human skin as an information-rich smart biological interface using MEMS sensors', all address MEMS-related issues. The first addresses fabrication issues, the second investigates system issues and the third examines an exciting BioMEMS application.

Developments that may impact on future MEMS systems are covered by the next three papers, 'Investigation of cylindrical and conical electrostatic wobble micromotors', 'Differential oversampling data converters in SEED Technology' and 'Design and simulation of a high efficiency Rotman lens for mm-wave collision avoidance sensor'. The first may be of interest to those developing micromotor systems, the second has potential impact for future MOEMS implementation and the RF MEMS field has implications for the third contribution.

The paper 'Optical MTF and quantum efficiency analysis in a finite slab', is of interest in the design of modern optical smart sensors and photodectors, where thin epi layers are concerned. The final contribution, 'Introduction to solid state quantum computation for engineers', is of interest in terms of providing impetus and research challenges to the area of smart nanostructures — furthermore this paper provides a compact introduction to quantum computation for engineers.

We thank all of the authors for their wonderful work and their cooperation. We sincerely hope that this special section is both thought provoking and meets the expectations of the reader.

Derek Abbott

Guest Editor for the Smart Electronics
and MEMS Conference
Bernard Courtois*

Guest Editor for the Design, Modeling and Simulation in
Microelectronics and MEMS Conference

* Corresponding author. Tel.: +33-4-76-57-46-15; fax: +33-4-76-47-38-14.