DCIS'2001 Programme

Tutorial Abstracts

Tutorial 1 – Tuesday, November 20, 14:00-16:00
New Approaches to Mixed-Signal Testing and Design-For-Test
Prof. Linda Milor
Georgia Tech, USA

Complexity of both leading edge process technologies and semiconductor products has increased in recent years in order to achieve higher levels of performance at lower cost per die. The use of advanced technologies increases manufacturing risk, even if a circuit is composed of pre-characterized components, because of the inability to completely characterize all facets of advanced processes. At the same time, the cost of testing as a fraction of total manufacturing cost is increasing, and the industry is striving to move towards the use of lower cost testers through introducing embedded test circuitry on chip. This tutorial will survey the causes of deep submicron manufacturing risk, together with tools available to test engineers to assist in test program development and embedded test methods.

Tutorial 2 – Friday, November 23, 17:30-19:30
Introduction to RF CMOS IC design
Prof. Mohammed Ismail
Ohio-State University, USA

This tutorial will serve as an introduction to the analysis and design of CMOS highly integrated transceivers for wireless applications. A top down approach will be used starting with transceiver design at the system level, followed by design techniques at the block and physical design levels for both the high frequency (GHz) blocks and mixed signal blocks in the analogue baseband. Interface with the digital baseband will also be discussed and the emphasis will be on multi band, multi standard radio design solutions. The material will be covered at an introductory level. Students and newcomers are particularly encouraged to attend.

Tutorial 3 – Friday, November 23, 15:00-17:00
Wireless Systems-on-a-Chip Design
Prof. Robert Brodersen
Univ. California, Berkeley, USA

There is a fundamental shift that is occurring in the implementation of wireless systems. Not only is the underlying technology shifting to mainstream CMOS technology, but the applications and specifications of the supported links is also rapidly evolving. These two trends result in radical shifts in the radio system architectures, which ranges from the implementation issues associated with the analog RF circuitry and the digital baseband processing to the basic techniques for dealing with multi-access and the impairments of the channel. All of these design issues are driven by an ever widening range of requirements from the high bandwidth needs of multimedia internet access to the ultra low power needs of sensor data networks.

The multiple inter-related technologies required for implementation of such wireless system requires a co-design strategy in communication algorithms, protocols, digital architectures as well the analog and digital circuits required for their implementation. The architectures for implementing these systems and how they scale into the future is a critical issue. The conclusion that will be shown is that software based systems, however successful they may be now, will become increasingly inappropriate into the future. A design infrastructure which supports more appropriate architectures will be described that has a particular emphasis on the interaction of the analog and digital aspects of the design, which will support a fully automated chip design flow.