Design Challenges and Emerging EDA Solutions in Mixed-Signal IC Design

Georges Gielen Katholieke Universiteit Leuven, Belgium

Abstract

With increasing integration levels, more and more ICs and systems-on-chip turn into mixed-signal designs. Typical examples are telecom (Bluetooth, WLAN, xDSL...) and multimedia (digital video, MP3 audio...) systems. This hot topic session will explore the challenges that designers face with these mixed-signal designs, covering both technical and methodological challenges as well as engineering resource and skill shortage problems. On the technical side, basic challenges are in incorporating analog design in a digital-oriented system design flow, signal integrity problems (supply and substrate noise, crosstalk...), trailing analog design productivity and test. In addition, the session will discuss the emerging progress in the methodology and EDA field, ranging from new software startups to analog and mixedsignal IP providers.

The session will start with a brief tutorial overview about the problems and emerging solutions in the mixedsignal domain, for the audience to get an update of the current state of the art in mixed-signal. This will be followed by a panel discussion, where the goal for the audience is to really explore where the unaddressed problems are in mixed-signal design and which problems are today close to being solved commercially in this dynamically moving market. Issues addressed by the panel members include the integration of analog and mixed-signal IP, the emergence of mixed-signal CAD tools including behavioral modeling and simulation as well as analog synthesis, the challenge of rapid technology changes and analog design retargeting, the mixed-signal signal integrity nightmare, the rise of specialized mixed-signal design companies, single-chip versus single-package integration, the trimming of analog courses in many recently restructured EE curricula and the shortage of analog designers.