

TCAD based DTCO and STCO

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Abstract: Design-Technology Co-Optimization (DTCO) and System-Technology Co-Optimization (STCO) has become mandatory in advanced technology nodes. It is well understood that tailoring the transistor characteristics by tuning the technology is not sufficient anymore. The interconnects also play important role in this process responsible for approximately half of the circuit performance. The transistor and interconnect characteristics have to meet the requirement for design and optimization of particular circuits, systems and corresponding products. Modeling and simulation play an increasing important role in the DTCO and STCO process with the benefits of speeding up and reducing the cost of the technology, circuit and system development and hence reducing the time-to-market. The DTCO and STCO also play critical role when making decisions about the next technology generations including the point of transition from FinFET to nanowire and nano-sheet architectures

In this tutorial we will introduce the key concepts of DTCO and STCO and the corresponding DTCO/STCO tools and flows originally developed by Gold Standard Simulations (GSS) and now marketed by Synopsys after the acquisition of GSS in 2016. The concepts will be illustrated with examples including both FinFET and PDSOI technologies. We will also describe how the DTCO and STCO can be used to make critical decisions regarding future technology generations.

Bios

Asen Asenov (FIEEE, FRSE) is the James Watt Professor in Electrical Engineering and the Leader of the renown Glasgow Device Modelling Group directs the development of quantum, Monte Carlo and classical models and tools and their application in the design of advanced and novel CMOS devices. He also was founder and the CEO of Gold Standard Simulations (GSS) Ltd. acquired in 2016 by Synopsys. He is currently also a CEO of Semiwise – a semiconductor IP and services company.

