



High-Level Modeling and Synthesis of Analog Integrated Systems [

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Monografía

Various approaches for finding optimal values for the parameters of analog cells, like op amps, have been investigated since the mid-1980s, and they have made their entrance in commercial applications. However, a larger impact on the performance is expected if tools are developed which operate on a higher abstraction level and consider multiple architectural choices to realize a particular functionality. High-Level Modeling and Synthesis of Analog Integrated Systems examines the opportunities, conditions, problems, solutions and systematic methodologies for this new generation of analog CAD tools. A new design paradigm is defined for high-level synthesis of AMS systems: the high-level design flow based on generic behavior. This design approach involves a modeling strategy using generic behavioral models and a synthesis strategy leading to the exploration of a heterogeneous design space containing different architectures. In High-Level Modeling and Synthesis of Analog Integrated Systems, two novel generic behavioral models are described. The first one adopts a time-domain approach and is suited for classes like Delta-Sigma modulators and sampled-data systems. For the second model, a new frequency-domain framework has been developed (the Phase- Frequency Transfer model) which allows the representation of classes of RF systems like front-ends of wireless receivers. To complete the high-level design strategy, the synthesis strategy has been concretized with a new top-down heterogeneous optimization algorithm. The general high-level design methodology for AMS systems and its concrete applications developed in this book serve as a fundamental framework for a new generation of analog CAD tools. By providing support for automated design space exploration at the architectural level, they realize an increase in design productivity

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