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Flex-Cell Optimization: A Paradigm Shift in High-Performance Cell-Based Design

Dr. Debashis Bhattacharya

Abstract

Automated standard-cell based design methodologies have revolutionized the process of digital design. Multi-million gate designs are now created by teams with less than 20 engineers, in a matter of months – a feat that would be unimaginable without heavy use of high-level modeling coupled with synthesis and automated physical design tools. At the same time, quality of designs created using automated flows, continues to be a concern for designers. This talk focuses on a design optimization technique that relies on judicious creation and use of design-dependent custom-crafted cells (flex-cells). Selected aspects of optimization with on-the-fly cell creation, along with results of applying this optimization methodology to some industrial circuits, are presented.

Biography

Dr. Debashis Bhattacharya is co-founder and Chief Technology Officer (CTO) of Zenasis Technologies, Inc., a venture-funded start-up in the Electronic Design Automation (EDA) space. Prior of founding Zenasis, has held positions as a faculty member in the Dept. of Electrical and Computer Engineering at Yale University, and with Texas Instruments R&D. Dr. Bhattacharya completed his undergraduate degree at IIT, Kharagpur, and M.S. and Ph.D. at University of Michigan, Ann Arbor. He has authored/co-authored 8 patents, over 25 publications, and 2 books. His areas of interest include high-performance digital design, design of DSP and mixed-signal systems, design and test of digital circuits and systems, and parallel algorithms for non-numerical problems.