



THE COMPUTER ENGINEERING RESEARCH CENTER
THE VLSI SEMINAR SERIES

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Temperature-aware synthesis of integrated circuits

Abstract

Increasing integrated circuit (IC) power consumptions and temperatures pose serious challenges to performance, cooling solutions, and lifetime reliability. In this talk, we describe modeling, analysis, and synthesis techniques to solve these problems systematically. We first describe an incremental synthesis technique permitting concurrent physical-level and architectural-level optimization. This technique makes it possible to rapidly determine the impact of architectural changes on IC power profile. We then describe an accurate IC thermal analysis method that uses spatial and temporal adaptation for the steady-state and dynamic thermal analysis problems. These techniques permit orders of magnitude speedup over conventional methods, permitting thermal analysis during synthesis. Finally, we describe an IC synthesis algorithm that optimizes area or peak temperature under performance constraints.

Biography

Robert Dick (<http://robertdick.org>) received his B.S. degree from Clarkson University and his Ph.D. degree from Princeton University. He worked as a Visiting Researcher at NEC Labs America, a Visiting Professor at Tsinghua University's Department of Electronic Engineering, and started work as an Assistant Professor at Northwestern University's Department of Electrical Engineering and Computer Science in 2003. Robert received an NSF CAREER award and won his department's Best Teacher of the Year award in 2004. He has published in the areas of embedded system design and synthesis; embedded operating systems; integrated circuit synthesis; thermal and power modeling and analysis; sensor networks; and ad-hoc wireless network protocols.

Friday, December 1, 2006, ACES 6.304, 3 pm
Coffee and cookie will be served. For more information about the VLSI Seminar Series,
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