



THE COMPUTER ENGINEERING RESEARCH CENTER

THE VLSI SEMINAR SERIES

Dr. Yehia Massoud

Rice University

Towards High Performance and Nanoscale System-on-Chip Design

Abstract:

The recent advancements in process technology have enabled the idea of a system on a chip (SOC) to become a reality, allowing designers to pack over 200 million devices on a single chip. However, with this density of integration, and increase in performance, a slew of second and third order effects that were little understood and that were safely ignored in the past came to the forefront of the SOC realization and posed challenges that are yet to be addressed. Another aspect of this SOC integration is that SOC's are increasingly containing analog, RF, and sensors. In this talk, I will address some of the challenges and opportunities that arise in high performance SOC's. The talk will address our efforts to mitigate some of the main problems introduced by the SOC integration and the technology scaling, such as signal integrity, inductive effects, and analog design automation. I will also talk about potential long-term solutions in Nanotechnology. Building interconnects that utilize nanophotonic or carbon nanotube technology would provide an excellent alternative for global interconnects and would alleviate the problems associated with current interconnect. By exploiting advances in Nanotechnology, engineers will be better equipped to deliver future high-performance Integrated Circuits.

Biography:

Yehia Massoud is an Assistant Professor in the departments of Electrical and Computer Engineering and Computer Science at Rice University, Houston, Texas, USA. He received the PhD degree in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology (MIT), Cambridge, MA, USA, in 1999. Before joining Rice University in 2003, he was a member of the Technical Staff at the Advanced Technology Group at Synopsys Inc., Mountain View, California, USA, from 1999 to 2003. He is interested in the modeling and design automation of high performance and future Systems-on-Chip as well as applications of Electromagnetics to Nanotechnology and Biotechnology. He received the National Science Foundation CAREER Award for 2004.

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