Ensuring System Reliability: From FET Characterization to Performance Prediction

Aditya Bansal
VLSI Design Dept.
IBM T.J. Watson Research
Yorktown Heights, NY 10598
bansal@us.ibm.com

Abstract: Transistor level temporal degradation is becoming a big reliability concern for systems in the field. These vulnerable systems range from ASICs in mobile devices to high-performance enterprise servers. To ensure reliable operation of these systems, we need to characterize device aging, predict its impact on system performance and build smart systems to adapt their functionality to device aging. In this presentation, we'll discuss the key ingredients of device models and tools for aging prediction due to BTI, HCI and TDDB. We'll also discuss the recent approaches for in-field adaptation of a system to its aging devices.

Bio: Aditya Bansal received the B.Tech. degree in Electrical Engineering from IT-BHU, India, in 2001; M.S. and the PhD degrees in Electrical and Computer Engineering from Purdue University in 2003 and 2007, respectively. He is currently a Research Staff Member at IBM T. J. Watson Research Center, NY. His current research interests are in design of technology characterization circuits for analysis and optimization of technological challenges in extremely scaled silicon technologies with primary focus on process immunity and temporal reliability. In addition, he is involved in the design of IBM's high performance servers. He has (co-)authored over 35 research papers in refereed journals and conferences.