

Department of Computer Science and Engineering

Presents the Faculty Candidate

Joon-Sung Yang
Low Power Intel Architecture

Tackling Defects, Errors, and Bugs in Nanoscale Devices

Test and debug are key steps in ramping up to volume production and it continues to take an increasingly larger fraction of the product cycle for each new generation of technology. Debug in particular has traditionally been done in an ad-hoc manner based on designer experience. However, due to process variations and growing functional complexity, the test and debug processes are becoming more complicated and expensive. Hence, the key factor in achieving efficient chip validation is to enhance internal signal controllability and observability. To address these challenges, I will present novel test/debug algorithms and architectures for inserting DFT (Design for Testability) / DFD (Design for Debug) features and capabilities. Three different approaches will be presented, for 1) output response compaction for detecting defects, 2) circuit operation observation by test/debug data collection and 3) access to internal signals using test points. I will also discuss the role of design and test in nanotechnology. A defect-tolerant design method for a nanoscale crossbar architecture to overcome issues raised by the smaller feature size etc. will be described. A discussion of future research directions will conclude the talk.

Dr. Joon-Sung Yang is currently a design engineer at the LPIA (Low Power Intel Architecture) DFX team in Intel Austin. He obtained his Ph. D. in Electrical and Computer Engineering from the University of Texas at Austin in 2009. His doctoral study focused on the systematic design for testability and design for debug S/W and H/W approaches in VLSI. His research interests also include design and test methodologies for nanoelectronic devices. He is a recipient of the Korean Government Fellowship (KOSEF) and the best paper award at IEEE International Symposium on Defect and Fault Tolerance in VLSI and Nanotechnology Systems in 2008.

Thursday, March 1, 2012 @ 3:30 pm

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