Puneet Gupta
Assistant Professor
UCLA

Puneet Gupta is currently a faculty member of the Electrical Engineering Department at UCLA. He received the B.Tech degree in Electrical Engineering from Indian Institute of Technology, Delhi in 2000 and Ph.D. in 2007 from University of California, San Diego. He co-founded Blaze DFM Inc. (acquired by Tela Inc.) in 2004 and served as its product architect till 2007.

He has authored over 80 papers, 15 U.S. patents, and a book chapter. He is a recipient of NSF CAREER award, ACM/SIGDA Outstanding New Faculty Award, European Design Automation Association Outstanding Dissertation Award and IBM Ph.D. fellowship. Dr. Puneet Gupta has given tutorial talks at DAC, ICCAD, Intl. Conference on Microelectronic Test Structures, SPIE Advanced Lithography Symposium, etc. He has served on the Technical Program Committee of DAC, ICCAD, ASPDAC among others. He served as the Program Chair of IEEE DFM&Y Workshop 2009, 2010, 2011.

Dr. Gupta’s research has focused on building high-value bridges across application-architecture-implementation-fabrication interfaces for lowered cost and power, increased yield and improved predictability of integrated circuits and systems.

ECE Seminar Hosts
Gabriela Hug ghug@ece.cmu.edu
Lujo Bauer lbauer@cmu.edu
Soummya Kar soummyak@andrew.cmu.edu
Jeff Weldon jweldon@ece.cmu.edu

Looking "Up" for Technology Scaling

Scaling of physical dimensions faster than the optical wavelengths or equipment tolerances used in the manufacturing line has led to increased process variability and low yields which make manufacturing expensive and design unpredictable. "Equivalent scaling" improvements - perhaps as much as one full technology generation, can come from looking "up" to circuit design and even to software (operating systems, compilers and applications).

In first half of the talk, I will talk about design-assisted technology scaling. With few examples from the lithographic patterning, and mask flows, I will illustrate how design information can be leveraged practically to radically reduce pessimism inherent in semiconductor manufacturing as well as guide process research and development.

In the second half of the talk, I speculatively argue for under-designed and opportunistic computing which offloads some of the variability handling burden to higher layers in the hardware-software stack. With examples from multimedia and sensor processing, I will show that a fluid hardware-software interface can result in substantial improvements in power, yield and application quality.