**Efficient Resilience in Future Systems: Design and Modeling Challenges**

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The cost of maintaining current levels of hardware reliability appears to be unaffordable in the post-22 nm late CMOS design era. In the first part of this talk, we will examine the reasons behind such a projection, based on the modeled trends in technology, circuits and microarchitecture. Then, in the second part, we will present a vision of cross-layer resilience optimization, which forms the basis of an IBM-led project sponsored by DARPA under its PERFECT program. The goal is to demonstrate through parameterized, cross-layer modeling that such an approach can help provide cost- and energy-efficient resilience in a class of future embedded systems of interest to DARPA, U.S. Department of Defense and also to the general IT appliance industry. The modeling framework is targeted to be flexible enough that customized trade-off analyses are expected to be of value to other R&D efforts geared toward high-end server, mainframe, cloud and large-scale supercomputing market segments as well.

**About the Speaker**

Pradip Bose is with IBM, Yorktown Heights, NY, USA, where he manages the Department of Power- and Reliability-Aware Microarchitectures. He has been involved in the design and pre-silicon modeling of virtually all IBM POWER-series microprocessors, since the pioneering POWER1 (RS/6000) machine, which started as the Cheetah/America superscalar RISC project at IBM Research. His current research interests are in embedded and high-performance computers, power-efficient, reliable microprocessor architectures, pre-silicon modeling and validation. Pradip holds MS and Ph.D. degrees from University of Illinois at Urbana-Champaign. His B.Tech (Hons.) degree was from I.I.T Kharagpur in India. He has won numerous awards and honors from IBM—including sixteen Invention Plateau awards, several Outstanding Innovation Awards, Technical Achievement Awards and Research Division Awards. He also holds the title of IBM Master Inventor and is a member of IBM’s Academy of Technology. Dr. Bose served as the Editor-in-Chief of IEEE Micro from 2003-2006 and is the current Chairperson of ACM SIGMICRO. He is a Fellow of the IEEE.