Software Controlled Memories for Scalable Many-Core Architectures

**ABSTRACT**

The emergence of many-core platforms increases the need for high memory bandwidth, which in creates the need for vast amounts of on-chip memory space. Designers must carefully provision the on-chip memory resources to meet application needs. Efficient memory management is extremely critical since it has a great impact on the system’s power consumption and throughput. While memory hierarchies have traditionally been based on SRAM-based on-chip caches, the demands of predictability, low power/energy, as well as the emergence of non-volatile memories (NVMs) and mixed-criticality systems, have led to increasing use of software-controlled on-chip memories. The talk presents strategies for efficiently managing software-controlled memories in the many-core domain, while addressing the various challenges designers face in deploying such memory subsystems (e.g., sharing memory resources, handling variability, and deploying heterogeneous memory families). The overall approach revisits and extends the classical notion of memory virtualization to handle scalable on-chip memory organizations.

**BIOGRAPHY**

Nikil Dutt is a Chancellor’s Professor of CS and EECS at the University of California, Irvine. He received a PhD from the University of Illinois at Urbana-Champaign (1989). His research interests are in embedded systems design automation, computer architecture, optimizing compilers, system specification techniques, distributed embedded systems, and brain-inspired architectures and computing. He has received numerous best paper awards and is coauthor of 7 books. Professor Dutt served as Editor-in-Chief of ACM TODAES (2003-2008) and currently serves as Associate Editor of ACM TOEC and of IEEE TVLSI. He was an ACM SIGDA Distinguished Lecturer during 2001-2002, and an IEEE Computer Society Distinguished Visitor for 2003-2005. He has served on the steering, organizing, and program committees of several premier CAD and Embedded System Design conferences and workshops, and serves or has served on the advisory boards of ACM SIGBED and ACM SIGDA. Professor Dutt is a Fellow of the IEEE, an ACM Distinguished Scientist, and recipient of the IFIP Silver Core Award.

**All are welcome!**

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