

COMPUTER SCIENCE COLLOQUIUM

Department of Computer Science
City University of Hong Kong

On Parallel Embedded Systems: Challenges and Optimizations

Dr SHA Edwin
Professor
Department of Computer Science
University of Texas at Dallas
USA

Date :

9 November 2007 (Friday)

Time :

10:30am - 11:30am (Refreshment will be served at 10:15am)

Venue :

Faculty Conference Room B6605, 6th Floor Blue Zone, Academic Building,
City University of Hong Kong, Tat Chee Avenue, Kowloon Tong.

Abstract

Computing systems are now moving toward “parallel” rapidly such as VLIW, multi-core, and multi-processor systems; for example, Intel is designing 80-core processors. To design an embedded system and software is technically hard because of the strict requirements in timing, code size, memory, low power, security, etc. while optimizing a “parallel” embedded system makes research even more challenging. The research in embedded systems needs integrated efforts in many areas such as algorithms, computer architectures, compilers, parallel processing, real-time systems, software engineering, etc. This talk will first use an example to show how to parallelize computations, give an overview of embedded system designs, and present the technical challenges particularly on software side. We will then show how to automatically parallelize loops optimally because loops are usually the most critical parts to be optimized. If time permits, the talk will then present our results developed in these 10 years for various types of optimizations for loops in timing, memory, power consumption, heterogeneous systems, etc. Many of our techniques give the best known results available in literatures.

Biography

Dr. Edwin Sha received the Master and Ph.D. degree from the Department of Computer Science, Princeton University, USA in 1991 and 1992, respectively. From August 1992 to August 2000, he was a faculty member in the Department of Computer Science and Engineering at University of Notre Dame, USA, and served as the Associate Chair since 1995. Since 2000, he has been a tenured full professor in the Department of Computer Science at the University of Texas at Dallas (UTD). After serving as the Computer Science Division Head at UTD, he has been the leader of the computer systems group and the computer engineering program at UTD.

His research interests are in embedded systems, parallel architectures, compilers, scheduling, network architectures, computer and network security.

He has published more than 220 research papers in refereed major journals and international conferences. He has been serving as editors for many premier journals including several IEEE Transactions, and as program committee members in numerous international conferences. He received Oak Ridge Association Junior Faculty Award, NSF CAREER Award, Notre Dame CSE Teaching Award, Microsoft Trustworthy Computing Curriculum Award and NSFC Overseas Distinguished Young Scholar (B). He also served as the program or general chairs for many international conferences such as GLSVLSI, PDCS 2000, PDCS 2001, SecUbiq 2005, PDES 2005, EUC 2006, ESO 2006, EUC 2007, etc. His projects have been mainly funded by the National Science Foundation, Microsoft, AT&T, Texas Instruments, Texas State, etc.

His web page can be found in <http://www.utdallas.edu/~edsha>

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*In case of questions, please contact Dr Jason Xue at Tel: 2788 9815, E-mail: jasonxue@cityu.edu.hk,
or visit the CS Departmental Seminar Web at <http://www.cs.cityu.edu.hk/>.*