

Md Kamruzzaman

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Objective

Highly motivated Ph.D. with strong background in computer architecture and compilers seeking a research and development position where I can exercise my research and problem solving skills.

Education

University of California, San Diego Sep 2006 – present

Ph.D. in Computer Science, Advisers: Dean Tullsen and Steven Swanson

Dissertation: “Exploiting Non-Traditional Parallelization Techniques.”

Expected Graduation Date: November, 2012

University of California, San Diego Sep 2006 – Sep 2009

M.Sc. in Computer Science. GPA: 3.88 in 4.0 scale

Selected courses: Principles of Computer Architecture, Parallel Architecture, Parallel Computation, Advanced Compilers, Internet Algorithms, Algorithm Design, Complexity, and Operating Systems

Bangladesh University of Engineering and Technology Dec 1998 – Feb 2004

B.Sc. in Computer Science and Engineering. GPA: 3.88(overall), 3.95(CSE courses) in 4.0 scale

Selected courses: Microprocessors, Digital System Design, VLSI Design, Computer Networks, Database, Software Engineering, Computer Graphics, Artificial Intelligence, and Simulation and Modeling

Research Experience

Research Assistant Jan 2007 – present

Computer Architecture Lab, University of California, San Diego

- Introduced a novel compiler-directed thread migration scheme that aggregates cache capacity across cores and chips to improve performance (17% on average) and energy efficiency.
- Developed the first helper thread prefetching technique that enables local access of data prefetched in separate cores. This gives 31 to 63% performance boost on average for single thread code.
- Investigated compiler heuristics that intelligently combines traditional and non-traditional parallelization techniques to improve scalability of pre-parallelized code by 17% on average.
- Analyzed the coupling of dynamic frequency scaling and software prefetching for energy efficiency.
- Proposed and evaluated an execution model that naturally extracts locality and load balancing for pipeline parallelism in the loop level. It outperforms prior techniques by 50%.

Publications

- “Software Data Spreading: Leveraging Distributed Caches in Multicore Systems to Improve Single Thread Performance”.
Md Kamruzzaman, Steven Swanson, and Dean Tullsen. In PLDI 2010.
- “Inter-core Prefetching for Multicore Processors Using Migrating Helper Threads”.
Md Kamruzzaman, Steven Swanson, and Dean Tullsen. In ASPLOS 2011.
- “Underclocked Software Prefetching: More Cores, Less Energy”.
Md Kamruzzaman, Steven Swanson, and Dean Tullsen. In IEEE Micro 2012.
- “Coalition Threading: Combining Traditional and Non-Traditional Parallelism to Maximize Scalability”.
Md Kamruzzaman, Steven Swanson, and Dean Tullsen. In PACT 2012.
- “Load-Balanced Pipeline Parallelism”.
Md Kamruzzaman, Steven Swanson, and Dean Tullsen. In submission.

Technical Skills

- Languages: Assembly, C, C++, Java, OCaml, Prolog, Python, R
- Programming: Lex, Yacc, MFC, OpenGL, POSIX Threads, OpenMP
- Tools: ROSE Compiler Framework, ATOM, PIN
- Advanced algorithms: Graph algorithms, Linear programming, Combinatorial optimizations, String algorithms, Advanced data structures, AI search techniques, Random number generating algorithms
- Special architectures: Programming Cell Broadband Engine
- Hardware performance counters: Using performance counters for Intel and AMD machines
- Simulators: SMTSIM, NS2

Professional Experience

Teaching Assistant, Algorithms

Winter, 2011

University of California, San Diego

Assisted Professor Andrew Kahng in designing questions, grading and conducting discussion sections.

Intern

Qualcomm Research, San Diego

Jun 2007 – Sep 2007

Developed a Google Earth like 3D interface for a Network Planning Tool using OpenGL

Lecturer

Feb 2006 – Sep 2006

CSE Department, Bangladesh University of Engineering and Technology

Lecturer and Programming contest coach

Feb 2004 – Feb 2006

American International University-Bangladesh

Programming Achievements

- Participated in **ACM ICPC World Finals** in 2002 (Hawaii), 2003 (Beverly Hills)
- **Champion** in **ACM ICPC Asia Regional 2001**, Dhaka Site; **3rd** in 2002, Dhaka Site; **4th** in 2003, Kanpur Site, and **5th** in 2003, Dhaka Site
- **Champion** in Tri University Programming Contest, 2002; **Champion** in Regional Warm up Contest, 2002; **Champion** in AIPC-2002 and AIPC-2003; **2nd** in National Computer Programming Contest, 2003; **Champion** in Inter University Programming Contest, 2003

Awards and Honors

- **UCSD CSE Department fellowship in 2006-2007**
- Dean's Award in Bangladesh University of Engineering and Technology
- University Talent Scholarship, Bangladesh University of Engineering and Technology
- University Grants Commission Scholarship, Bangladesh

Professional Activities

- External reviewer of HPCA 2012 and HPCA 2013; Reviewer of IEEE Micro, 2012
- Judge and Problem setter of ACM ICPC Asia Regional 2005, Dhaka Site; National Computer Programming Contest-2004, Bangladesh
- Guest speaker for programming contests – Dhaka University, Jahangirnagar University, Independent University, North South University, and International Islamic University Chittagong
- Member of Elite Problem setters' Panel, ACM Valladolid Online Judge, Spain
- Member of ACM

Reference

Available upon request