Paramjit Singh Oberoi

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Education

UNIVERSITY OF WISCONSIN–MADISON (Aug 1998–Present)
Ph.D. (Computer Architecture) - Not Completed (ABD)
M.S. (Computer Sciences) - May 2000
Advisor: Dr. Gurindar Sohi

REGIONAL ENGINEERING COLLEGE, TIRUCHIRAPALLI (INDIA) (Aug 1994–May 1998)
Bachelor of Engineering (Computer Science and Engineering)
Graduated with Distinction in May 1998

Ph.D. Research

COMPUTER ARCHITECTURE: High-bandwidth instruction fetch
Developed novel high-bandwidth instruction fetch and rename mechanisms that (1) enable reordering fetch of instructions for better performance, and (2) can be built out of multiple simpler fetch and rename units operating in parallel.

Publications

PARALLELISM IN THE FRONT-END
Paramjit Oberoi and Gurindar Sohi. In *Proceedings of the 30th International Symposium on Computer Architecture*, Pages 230–240, San Diego, California, Jun 9–11, 2003.

OUT-OF-ORDER INSTRUCTION FETCH USING MULTIPLE SEQUENCERS
Paramjit Oberoi and Gurindar Sohi. In *Proceedings of the 2002 International Conference on Parallel Processing*, Pages 14–23, Vancouver, Canada, Aug 18–21, 2002.

Work History

INTEL - MICROPROCESSOR RESEARCH LAB (May 2000–Sep 2000)
Studied ways of improving performance of dynamic multithreading on the IA-64 architecture. Rapidly evaluated various techniques using an abstract first-order performance model.

COMPUTER SCIENCES DEPARTMENT, UNIVERSITY OF WISCONSIN (Aug 1999–Aug 2004)
Carried out computer architecture research under the guidance of Dr. Gurindar Sohi; primarily studied techniques for improving front end throughput, i.e., instruction fetch and rename. Modeled the mechanisms under study using detailed execution-driven processor simulators.

Projects

TRAVERSAL REUSE FOR RECURSIVE DATA STRUCTURES (UW-Madison, Spring 2000)
Instrumented C programs to profile recursive data structure traversals using a source-to-source translator written in ML. Evaluated the potential of exploiting repetitive traversals for data prefetching.

VERSIONING EXTENSIONS FOR LINUX FILESYSTEMS (UW-Madison, Spring 1999)
Implemented a Linux kernel module for file versioning at the system call level. The functionality was completely independent of the underlying file system.

A DISTRIBUTED QUERY ENGINE FOR XML-QL (UW-Madison, Spring 1999)
A query engine for searching XML databases (in Java). Non-local XML files could either be fetched, or, optionally, automatically generated partial queries were executed on the remote machine and the results were combined appropriately.

Projects (cont.)

EXCEEDING THE PERFORMANCE OF RELEASE CONSISTENCY (UW-Madison, Spring 1999)
A common way of recovering from faulting speculative loads is to squash and re-execute all subsequent instructions. Using an execution-driven multiprocessor simulator, we determined that there was significant potential for better performance if a less conservative mechanism were used.

INFORMATION RETRIEVAL USING AUTONOMOUS MOBILE AGENTS (REC Tiruchirapalli, Spring 1998): Design and Implementation of an autonomous mobile agent requiring no special services on the machines to be visited (only Telnet, FTP, and Java required).

A FAULT-TOLERANT TREE COMMUNICATION ALGORITHM FOR THE ENHANCED EXTENDED HYPERCUBE (REC Tiruchirapalli, Fall 1997): A fault-tolerant algorithm for mapping a tree communication scheme onto an enhanced extended hypercube, and its evaluation using simulation.

POPSEND: AN INSTANT MESSAGING UTILITY FOR NETWARE/DOS (REC Tiruchirapalli, 1995): A utility for sending messages to users logged into a NetWare network without exiting the currently executing program (implemented by modifying the keyboard interrupt handler; written in assembly language). Heavily used on campus till at least 2002.

MISCELLANEOUS PERSONAL PROJECTS: An online, searchable NGO directory with import/export to Excel spreadsheets (2001-02, in a combination of CPython and Jython). A GNOME applet for controlling the Moosic music player (2003-04, in Python). A static-HTML image gallery generator in Python (2004).

Honors and Awards

WARF Fellowship (1998–1999)
College Merit Scholarship (1994–1998)
Ranked 1 in a class of 61 students at REC Tiruchirapalli (1998).

Skills

PROGRAMMING LANGUAGES:
...that I use regularly: C, C++, Python
...that I use occasionally: Awk, Bash, HTML, Java, Perl, SQL, XSL
...that I used to know: Basic, Fortran, ML, Pascal, Prolog, x86/8085 Assembly

PROCESSOR SIMULATORS: SimpleScalar-based simulators, RSim
OTHER TOOLS: LaTeX, Mentor (VLSI Design), UNIX, Visual Basic

Nationality

Indian

Languages

English, Hindi

References

Available on request