Guest Editors' Introduction:

HOT CHIPS AND THE MICROPROCESSOR

Norman P. Jouppi, Digital Equipment Corp.  Hasan S. AlKhatib, Santa Clara University

This special issue of IEEE Micro features some of the best presentations from last year's annual Hot Chips Symposium. Hot Chips enjoyed another year of spectacular success with over 800 attendees from around the world who gathered at Stanford University to listen to the latest and hottest developments in the chip industry. This symposium is the seventh of a series that started in 1989.
This year is the 25th anniversary of the development of the microprocessor. The fruit of hard work by Intel engineers, the microprocessor was initially a versatile solution for calculators. No one in 1970 could have predicted the tremendous impact the microprocessor would have on the way we live. To a great extent, today’s information revolution can be traced to this momentous event. Only our imagination limits what lies ahead.

The 1995 Hot Chips program included presentations on the latest chip technologies for microprocessors, graphics controllers, multimedia components, and emerging multiprocessing support chips. The symposium also offered two well-attended tutorials, one addressing the x86 architecture evolution and the second discussing hot chips for computer graphics. The highlight of the symposium was the keynote address by Gordon Moore of Intel Corporation, who discussed the future prospects for the microprocessor and chip industries.

Nam Ling of Santa Clara University served as symposium general chair. We cochaired the Program Committee, ably helped by Donald Alpert, Intel Corporation; Forest Baskett, Silicon Graphics; Robert Garner, Sun Microsystems; Mark Horowitz, Stanford University; Vivian Shen, Hewlett-Packard; Shanker Singh, IBM; Alan J. Smith, UC Berkeley; and Winfried Wilcke, Hal Computer Systems. This committee selected some of the best presentations, asked authors for full versions, and reviewed each for your benefit here.

David B. Papworth shares the design choices made to tune the design and implementation of the Pentium Pro chip. Dave Christie addresses the latest introduction of an x86-based processor from AMD. Ken Yeager presents the architecture and features of the Silicon Graphics R10000 Mips microprocessor. Marc Tremblay and J. Michael O’Connor present Sun’s implementation of the latest Sparc processor, UltraSparc I, which has multimedia support. Finally, Toshio Kondo and his team conclude with an interesting chip set solution for multimedia from NTT.

Unfortunately, we did not have space in this issue for all the excellent papers we received. An article by Monica Lam and her team at Stanford University, which makes a case for moving toward multiprocessors on a single chip, will appear in the June issue.

WE HOPE YOU ENJOY this collection and invite you to participate in Hot Chips VIII to be held at Stanford University on August 18-20, 1996.

Norman P. Jouppi is currently a consulting engineer at Digital Equipment Corporation’s Western Research Lab and a consulting associate professor in the Electrical Engineering Department at Stanford University. He was one of the principal architects and implementers of the MIPS processor at Stanford. At Digital, he was a principal architect and implementer of the MultiTitan and BIPS microprocessors. His current research interests include computer architecture, graphics, VLSI design, and circuit design.

Jouppi received the BSEE and MSEE degrees from Northwestern University and the PhD degree in electrical engineering from Stanford. He is a member of the IEEE, the Computer Society, and the ACM.

Hasan S. AlKhatib is an associate professor of computer engineering and director of the Distributed Computing Research Laboratory at Santa Clara University in California. He founded and is president of TTC of Silicon Valley, Inc., an R&D company specializing in performance analysis and network software development in Los Gatos, California.

AlKhatib received his PhD in electrical and computer engineering from the University of California, Santa Barbara. His MS from the Illinois Institute of Technology and BS from Baghdad University are both in electrical engineering. He has chaired the Computer Society’s Technical Committee on Microprocessors and Microcomputers, and served as general chair of the IEEE Computer Conference, Hot Chips Symposium, and Hot Interconnects Symposium.

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