

# August 18, 1996

## Kresge Auditorium

### Sunday Tutorial Schedule

7:30 – 8:30	Registration & Coffee at Kresge Auditorium
8:30 – 12:00	Java Software Secrets
12:00 – 1:00	Lunch
1:00 – 5:00	Toward 10 Introductions/Cycle Uniprocessors
5:00 – 6:30	Wine & Cheese Reception in the Old Union Courtyard

### JAVA SOFTWARE SECRETS

Sami Shao, Co-founder, Java Start up

Java Has the computer world abuzz with its promise of a truly platform-independent, object-oriented language, developed for distributed computing environments. 'Applets' written in Java can be downloaded over a network and safely executed in the client computer.

The tutorial starts with a description of the Java language and useful programming idioms. Then we will explore some of the new Java development environments available and provide a hands-on tutorial on programming to the Java API—with emphasis on the graphical user interface package (AWT class) and the networking libraries.

In addition to applets, we will also cover some techniques for programming stand-alone applications and show that Java is a very modern and useful language for all kinds of applications, not just for applets on a web page.

### TOWARD 10 INSTRUCTIONS/CYCLE UNIPROCESSORS

Yale Patt, Prof. of EE & CS, University of Michigan

The marketplace continues to demand more /more performance from the computer systems we deliver. To us, that translates in part to packing more performance on a single chip. The process technology people promise 100 Million transistors in the year 2000, and 10 Billion by the year 2010.

What do we do with them? Several paradigms have been put forward: VLIW (which I dismiss), MP on a chip (which I think is not the best approach), and one 10 IPC uniprocessor on a chip (the answer of choice—mine!).

How do we get there? The problem has three parts: instruction supply, data supply and instruction processing. And three components to the solution: microarchitecture, compiler and algorithm. In this talk, I will discuss some of what is going on in these dimensions that should lead to a 10 IPC uniprocessor (on integer benchmarks, of course).

Java  
turns

# Final Program

## Monday, August 19, 1996—Kresge Auditorium

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<b>8:00–9:00</b> <b>Registration and Coffee</b>	
<b>9:00–9:15</b> <b>Welcome and Opening Remarks</b> Dennis Reinhardt, Intel, General Chair Robert Garner and Winfried Wilcke, Program Co-Chairs	
<b>9:15–10:45</b> <b>Session 1: High Performance Microprocessors</b> Norm Jouppi, Digital Equipment Corporation	
<b>1.1</b> <b>The HP PA-8000 RISC CPU: A High Performance Out-of-Order Processor</b> Ashok Kumar, Hewlett Packard	<b>9</b>
<b>1.2</b> <b>Design Objective of the 0.35-micron Alpha 21164 Microprocessor</b> Gregg Bouchard, Pete Bannon, Digital Equipment Corporation	<b>21</b>
<b>1.3</b> <b>The Orca Chip... Heart of IBM's RISC System/6000 "Value" Servers</b> Ravi Arimilli, IBM	<b>35</b>
<b>10:45–11:15</b> <b>Break</b>	
<b>11:15–12:45</b> <b>Session 2: Compilers and Emulation.</b> John Mashey, Silicon Graphics, Inc.	
<b>2.1</b> <b>The Wabi CPU Emulator Technology</b> Paul Hohensee, Mathew Myszewski, David Reese, Sun Microsystems, Inc.	<b>47</b>
<b>2.2</b> <b>A Parallelizing Compiler for UltraSPARC Systems</b> Partha Tirumalai, Vinod Grover, Xiangyun Kong, Michael Lai, Jian-Zhong Wang, Kurt Goebel, Chris Aoki, Peter Damron, Krishna Subramanian, Sun Microsystems, Inc.	<b>67</b>
<b>2.3</b> <b>The RISC Penalty</b> Tom Pittman, Microprocessor Consultant	
<b>12:45–2:00</b> <b>Lunch</b>	
<b>2:00–2:45</b> <b>Keynote Address: Microprocessor Architecture: The Next Ten Years and Beyond</b> Bill Joy, Sun Microsystems, Inc.	
<b>2:45–3:45</b> <b>Session 3: Memory Technologies.</b> Winfried Wilcke	
<b>3.1</b> <b>The Case for Intelligent DRAM: IRAM</b> Dave Patterson, University of California, Berkeley	<b>75</b>
<b>3.2</b> <b>High Performance Caches—The Quiet Revolution</b> David Chapman, Motorola	<b>95</b>
<b>3:45–4:15</b> <b>Break</b>	
<b>4:15–5:45</b> <b>Session 4: Embedded Processors.</b> Robert Garner, Sun Microsystems, Inc.	
<b>4.1</b> <b>ARM810—Dancing to the Beat of a Different Drum</b> Guy Larri, Advanced RISC Machines Ltd.	<b>109</b>
<b>4.2</b> <b>StrongArm 110: A 160MHz 32b 0.5W CMOS ARM Processor</b> Sribalan Santhanam, Digital Equipment Corporation	<b>119</b>
<b>4.3</b> <b>PicoJava™: A hardware Implementation of the Java Virtual Machine</b> Marc Tremblay, Michael O'Connor, Sun Microsystems, Inc.	<b>131</b>
<b>5:45–8:00</b> <b>Monday Evening Buffet Dinner</b>	
<b>7:30–9:30</b> <b>Evening Panel Session, Lagunita Court: Software or Silicon—What's the Best Route to Java?"</b> Moderator: John Wharton, Consultant/Analyst, Applications Research. Panel members: John Banning, Member of the Technical Staff, Silicon Graphics Computer Systems Inc.; Brian Case, Consultant; David S. Hardin, Senior Design Engineer, Rockwell; Martin Hopkins, IBM Fellow, IBM Watson Research Center; John Novitsky, Director, CPU Product Group, MicroModule Systems; Marc Tremblay, Chief Architect for Java Chips™, Sun Microelectronics	<b>145</b>

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## Tuesday, August 20, 1996—Kresge Auditorium

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<b>5.1 Intel MMX Technology—an Overview</b>	<b>147</b>
Uri Weiser, Intel	
<b>5.2 The P55C Microarchitecture—First Implementation of MMX Technology</b>	<b>157</b>
Michael Kagan, Intel	
<b>5.3 Multimedia Instruction Set Extensions for a 6th Generation Processor</b>	<b>163</b>
Rober Maher, Cyrix	
<b>10:30–11:00</b> Break	
<b>11:00–12:30</b> <b>Session 6: Multimedia Accelerators</b> Steve Purcell, Chromatic Research	
<b>6.1 The Trimedia TM-1 PCI VLIW Mediaprocessor</b>	<b>171</b>
Gerrit A. Slavenburg, Philips Semiconductors	
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Paul Kalapathy and Phil Holden, Chromatic Research	
<b>6.3 VLIW Processor for Multimedia Applications</b>	<b>193</b>
Edgar Holmann, Toyohiko Yoshida, Akira Yamada, Yukihiro Shimazu, Mitsubishi Electric Corporation, System LSI Laboratory	
<b>12:30–2:00</b> Lunch	
<b>2:00–3:30</b> <b>Session 7: The Touchstone Project</b> Carole Dulong, Intel	
<b>7.1 Touchstone—A Fresh Approach to Multimedia for the PC</b>	<b>203</b>
Martin Randall, Emmett Kilgariff, Silicon Engineering, Inc.	
<b>7.2 Multi_media Signal Processor (MSP) Summary</b>	<b>217</b>
L. T. Nguyen, M. Mohamed, H. Park, Y. Pai, R. Wong, A. Qureshi, P. Psong, F. Valesco, H. D. Truong, C. Reader, Samsung Semiconductor, Inc.	
<b>7.3 Custom VLSI for the Compositing Buffer and Media DAC Functions</b>	<b>227</b>
Ali Djabbari, Fujitsu Microelectronics, Inc.	
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<b>8.1 Surface Micromachining—An IC Compatible Sensor Technology</b>	<b>241</b>
Bernhard E. Boser, University of California, Berkeley	
<b>8.2 AMULET2e</b>	<b>257</b>
Jim Garside, University of Manchester	
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<b>9.1 Permedia and GLINT Delta, New Generation Silicon for 3D Graphics</b>	<b>275</b>
Neil Trevett, 3DLabs	
<b>9.2 Bringing Workstation Graphics Performance to a Desktop Near You,     ViRGE VX</b>	<b>289</b>
Anoop Khurana, S3, Inc.	
<b>9.3 InfiniteReality Graphics—Power Through Complexity</b>	<b>299</b>
Brian McClendon, John Montrym, Silicon Graphics, Inc.	
<b>6:30</b> <b>Closing Remarks</b> Robert G. Stewart, Stewart Research Enterprises	