



The Information Science & Technology Center ...at Colorado State University

Colorado State University's Information Science and Technology Center (ISTeC)

presents two lectures by



Dr. Yale Patt

Electrical and Computer Engineering
University of Texas at Austin

**Joint Computer Science Department and
Electrical and Computer Engineering Seminar**
sponsored by ISTeC

***"The Microprocessor in the Year 2015: Issues, Challenges,
Potential Avenues to Solutions"***

Monday, April 11, 2005

Reception: 3:30 pm

Lecture: 4:10 pm to 5:00 pm

Ammons Hall President's Room



ISTeC Distinguished Lecture

"Education. Are there any questions?"

Tuesday, April 12, 2005

Post luncheon dessert: 12:30 to 1:00 pm

Lecture: 1:00 to 2:00 pm

Post lecture coffee reception: 2:00 to 3:00 pm

Lory Student Center Theater

ABSTRACTS

“The Microprocessor in the Year 2015: Issues, Challenges, Potential Avenues to Solutions”

The first time I gave this talk (not really THIS talk), the year was 1985 and the title was "The Microprocessor in the Year 1995." Moore's law was promising 10 million transistors on a chip and the question was what to do with all that potential. Some gurus said "Give it up. We've reached the end of the line as far as microarchitectural improvements are concerned." But, we didn't give up, and ten years later, we had the Pentium Pro, for example. Time passes, Moore's Law continues to be alive and well, and we continue to look ten years out. At the High Performance Computer Architecture conference less than two months ago, a senior Intel computer architect promised 10 to 50 billion transistors by 2015. Even in the near term, we will soon see one billion transistors on a chip, running at a frequency in excess of 10 GHz. With such potential, a lot of problems that were minor in the past are now starting to drive chip design. Like power consumption, off chip delay to memory, on chip delays, effectiveness of deep pipelines, etc. And, still some gurus say, "Give it up." This talk looks at the above, explains the issues and suggests avenues that could make a difference.

“Education. Are there any questions?”

After more than 30 years in this business, I have acquired more than a few opinions on education. One could group them into a series of talks such as:

- Intro to Computing: The CORRECT approach
- Computer technology -- a new core discipline
- My Ten Commandments of Good Teaching
- High Tech -- the enemy of Education
- Distance Learning -- Will the Dean ever get it?
- Politically Correct -- another enemy of education

....and, I could give one of them. But how would I know I was talking about something that anyone in the audience wanted to hear about? Ergo, the title. I will start with one slide each on a few of the above items, and then ramble. Until someone asks a question. And, we will go from there. Until someone asks another question. This talk has no compass to get us back on track since there is no track.

Dr. Yale Patt (<http://www.ece.utexas.edu/~patt/>) is Professor of Electrical and Computer Engineering and the Ernest Cockrell, Jr. Centennial Chair in Engineering at The University of Texas at Austin. He directs the research of 13 PhD students in high performance computer architecture and implementation, and enjoys teaching both large undergraduate classes and small advanced graduate seminars. He has, for more than 35 years, combined an active research program with extensive consulting in industry and a strong commitment to teaching. The research he has conducted with his students has had major impact on the microprocessor industry. HPS (the integration of wide-issue, speculative, out-of-order execution, and in-order retirement), the two-level branch predictor, and SSMT (more commonly called helper threads) are three examples. Dr. Patt has received many awards for his research and teaching, including the IEEE Emmanuel R. Piore Medal in 1995, the IEEE/ACM Eckert-Mauchly Award in 1996, the IEEE Wallace W. McDowell Award in 1999, and the ACM Karl V. Karlstrom Outstanding Educator Award in 2000. His vital concern for how we introduce computing to computer science and engineering majors has led to "Introduction to Computing Systems, from Bits and Gates to C and Beyond," co-authored with Professor Sanjay Patel of Illinois. Yale Patt earned his BS at Northeastern and MS and PhD at Stanford, all in electrical engineering. He is a Fellow of both the IEEE and of the ACM.

To arrange a **meeting with the speaker**, please contact MaryAnn Stroub at (970) 491-2708 or mstroub@engr.colostate.edu

ISTeC (Information Science and Technology Center) is a university-wide organization for promoting, facilitating, and enhancing CSU's research, education, and outreach activities pertaining to the design and innovative application of computer, communication, and information systems. For more information please see ISTeC.ColoState.edu.