Keynote Talk

Multicore Architectures

Trevor Mudge
Bredt Family Professor of Engineering
The University of Michigan, Ann Arbor
tnm@eecs.umich.edu

Abstract

In this talk we will give an overview of recent developments in multicore architectures. We will discuss the basic architectural features of today's multicore microprocessors and illustrate those features with examples from current commercial machines from AMD, IBM, Intel, and SUN. We will examine how features have been added to simplify the task of programming these architectures. Hardware support for cache coherence is well-known, but we will also discuss transactional memory, a relatively recent proposal to simplify parallel programming, which has yet to be incorporated in any widely used architecture.

Finally, we will look at trends in semiconductor technology to see how they may impact the future of multicore architectures.

Categories & Subject Descriptors: C.1.2 Computer Systems Organization, PROCESSOR ARCHITECTURES, Multiple Data Stream Architectures (Multiprocessors), Parallel processors

General Terms: Design, Performance.

Keywords: Multicore.

Bio

Trevor Mudge received the Ph.D. degree in Computer Science from the University of Illinois, Urbana, in 1977. Since then, he has been on the faculty of the University of Michigan, Ann Arbor. Three years ago he was named the first Bredt Family Professor of Electrical Engineering and Computer Science after concluding a ten year term as the Director of the Advanced Computer Architecture Laboratory -- a group of about 8 faculty and 80 graduate students. He is author of numerous papers on computer architecture, programming languages, VLSI design, and computer vision. He has also chaired 33 theses in these research areas. In addition to faculty position, he runs Idiot Savants, a chip design consultancy. Trevor Mudge is a Fellow of the IEEE, a member of the ACM, the IET, and the British Computer Society.