

# Keynote Presentation

## Managing the Transition from Complexity to Elegance

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**Abstract:** In computer design, complexity comes naturally, and complexity-effective design is a study in trade-offs. The *art* of computer design involves finding elegant solutions for the most common operations, and avoiding complexity creep as problems are discovered. In some sense, it is the job of the computer architect to manage the design to an appropriate *complexity budget*.

This talk will describe a process for managing complexity in microprocessor design. First, I will describe the importance of identifying a relatively small set of fundamental design principles for guiding the overall design. I will show some examples that demonstrate how the best principles emerge from finding natural alignment between technology characteristics, circuit structures, and micro-architectural functions. Second, I will describe a phased design process that surfaces more of the inherent complexity of the design sooner, enabling the design team to make better choices about how to invest their limited complexity budget.

In the final section of the talk, I will identify some emerging technology and market trends that will likely influence the fundamental design principles appropriate for the next generation of computer designs.

**Bio:** Charles Moore is a Senior Research Fellow at the University of Texas at Austin working in the Computer Architecture and Technology Laboratory. Prior to joining UT-Austin, Mr. Moore spent 18 years at IBM where he was a Distinguished Engineer in the IBM Server Group. While at IBM, he led several PowerPC microprocessor development efforts, and was most recently the Chief Engineer on the POWER4 project. He has 12 patents that have been granted and an additional 24 that have been filed in the area of microprocessor design.

Mr. Moore has a BSEE from Rensselaer Polytechnic Institute, and a MSEE from the University of Texas at Austin. He is a member of the ACM and a Senior Member of the IEEE.