

Hardware/Software Co-Designed Processors

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Abstract

Virtual machines are receiving and increasing interest from industry and academia. They offer new opportunities in multiple areas including programming languages, operating systems and processor architecture. This talk reviews this technology and focuses on some recent research efforts in the area of processor architecture. Virtual machines can turn processor development into a codesigned effort between hardware and software. Novel mechanisms can be implemented by taking advantage of the flexibility of the software and the efficiency of the hardware. This opens new avenues for powerful schemes to improve performance, reduce power and increase reliability.

Bio

Antonio González received his M.S. and Ph.D. degrees from the Universitat Politècnica de Catalunya (UPC), in Barcelona, Spain. He is the founding director of the Intel Barcelona Research Center, started in 2002, whose research focuses on new microarchitecture paradigms and code generation techniques for future microprocessors. Prior to this, he joined the faculty of the Computer Architecture Department of UPC in 1986, and became a Full Professor in 2002. He currently holds a part-time Professor position at this department.

Antonio González has published over 300 papers, has given over 80 invited talks, has filed over 40 patents and has advised 16 PhD theses in the areas of computer architecture and compilers. He has been an Associate Editor of the IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, ACM Transactions on Architecture and Code Optimization, and Journal of Embedded Computing. He has served on over 100 program committees for international symposia in the field of computer architecture, and has been program chair for ICS 2003, ISPASS 2003, MICRO 2004 and HPCA 2008, and general chair for MICRO 2008, among other symposia.