PLENARY SESSION 2
WEDNESDAY LUNCH, AUG. 10, 2005

Reconfigurable and Evolvable Hardware Systems

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Summary

Evolvable Hardware can change its architecture and behavior dynamically and autonomously by interacting with its environment. This interaction can range from reconfigurable, self-reconfigurable to evolvable nano-electronics. At present, almost all evolvable hardware use evolutionary algorithms as their main adaptive mechanism. Other tools available are genetic algorithms, neural networks and evolution strategies.

Reconfigurable and evolvable hardware systems are going to be increasingly important in remotely operated autonomous vehicles and robotics that will enable long-term, reliable, low-power, and intelligent exploration in hostile environments. Moreover, they have the potential to be the underlying technology behind the avionics and space infrastructure in the future. In this talk we review the state of the art and discuss approaches to evolvable hardware based on self-reconfiguration and adaptive training.

Biography

Chris Papachristou is Professor of Electrical Engineering and Computer Science at Case Western Reserve. He received the Ph.D. degree in Electrical Engineering and Computer Science from Johns Hopkins University. His research interests include Design Automation, Testing and Reliability of VLSI Systems, Reconfigurable Computing Architecture Design, and Wireless Digital Systems. He has published numerous articles in these areas, consulted with industry and government, served as Program Chair and General Chair of several IEEE/ACM conferences and been on the program committees of many international conferences and workshops. He is a Fellow of the IEEE and a member of the ACM and Sigma XI, and is listed in Who's Who in America.