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Presents

A Methodology for Creating Application Specific Processor Architectures

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Abstract

Performance improvement through datapath extensions with Application Specific Functional Units has been a subject of research for more than a decade now. However, we feel that full potential of this approach has not been exploited due to several obstacles. This talk presents techniques to get past some of these obstacles.

Usually a cluster of operations identified from the application defines a new custom instruction and forms the behavior of an Application Specific Functional Unit that implements this instruction. In the techniques available for identifying such clusters, the number of register file ports constrains the number of inputs and outputs for a legal operation cluster, thus limiting the overall achievable speedup. We present a technique that circumvents the constraints imposed by register file ports and results in a significantly higher speed up. We also address the issue of estimation of the speedup achievable for the clusters identified.

Biography

Anshul Kumar is currently a Professor of Computer Science and Engineering at IIT Delhi. He obtained his B.Tech. and Ph.D. degrees from IIT Delhi in the years 1974 and 1980 respectively and was awarded the President's Gold Medal in 1974. He has been involved in teaching and research at IIT Delhi for more than 20 years in the areas of VLSI synthesis, embedded systems and high performance computer architectures and has published or presented nearly hundred papers. He has held visiting appointments at University of Southern California, University of Edinburgh, KTH Stockholm and EPFL Laussane. Along with some colleagues and graduating students of his department, he recently founded a company called Kritikal Solutions under the Technology Business Incubation Program of IIT Delhi.

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Calit2 Room 3008

Talk begins at 11:00am; Refreshments at 10:30am

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