

KEYNOTE SPEECH

A VLSI System Perspective for Microprocessors Beyond 100 nm

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Abstract

Microprocessor performance increased by five orders of magnitude in the last three decades. This was made possible by continued technology scaling, improving transistor performance to increase frequency, increasing integration capacity to realize complex architectures, and reducing energy consumed per logic operation to keep power dissipation within limit. The technology treadmill will continue to fulfill the microprocessor performance demand; however, with some adverse effects posing barriers. Therefore, performance at any cost will not be an option; significant improvements in efficiency of transistor utilization will be necessary. This paper will discuss potential solutions in all disciplines, such as microarchitecture, circuits, design technologies & methodologies, thermals, and power delivery to overcome these barriers in technologies beyond 100 nm.