

Tera-Scale Microprocessors

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This talk will focus on Tera-Scale processors. This term refers to future microprocessors capable of delivering teraflops of performance and handling terabytes of data.

Moore's law will continue to provide us with more and faster transistors but with new characteristics that we have to keep in mind when designing future microprocessors. The most important aspects that will impact the design of future microprocessors are: constrained power budget with no increase from where we are nowadays, an increase in parameter variations, and higher vulnerability to various types of faults. On the other hand, emerging workloads that will drive the design of high-performance processors will exhibit significant amounts of thread level parallelism.

Under this scenario, many-core processors are the best approach for future microprocessor since they are more power-efficient, more adaptable and more reliable than single core architectures.

The talk will conclude by pointing out some of the key research areas for the future of many-core processors: scalable architectures, adaptable architecture, resilient designs and programmability.