Variability Analysis in the Power Appetite of GPGPU Applications

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Abstract

Due to the high-performance demands, GPGPUs are designed to be optimized for higher performance, even at the cost of large power consumption. This article presents the variation in the power appetite of GPGPU applications. It proposes a method to predict the characteristics of an application through the way power is consumed by different components of the GPGPU. It is observed that certain components which are over-used by one application may be under-used by another application. This presents a challenge for the GPU architects to design a favorable and balanced system for different types of GPGPU applications. An architecture that improves power efficiency is currently required but for time-constraint real time system, performance cannot be compromised. This work is an attempt to provide precious insights on designing a reconfigurable system that fulfills the demand of end users.

References

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Index Terms

Computer Science  Information Sciences

Keywords

Variability analysis, power breakdown, cycle-accurate, frequency scaling.