Abstract

Multimedia applications are present in most mobile hand-held devices. H.264 is an emerging video coding standard, which aims at compressing high-quality video contents at low-bit rates. While the new encoding and decoding processes are similar to many previous standards, the new standard includes a number of new features and thus requires much more computation than most existing standards do. The complexity of H.264 standard poses a large amount of challenges to implementing the encoder/decoder in real-time requiring large amount of processing resources. This paper presents the design and analysis of the H.264 decoder implemented on a heterogeneous architecture (multi-CPUs/multi-GPUs). A model-driven approach is adopted by using the standard MARTE profile of UML. Our approach is based on hybrid partitioning that combines both functional and data partitioning which is applied to find the most suitable processors (CPU or GPU) regarding the execution time. We claim that our approach allows giving a better performance, which is crucial when implemented in modern complex systems.
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Index Terms

Computer Science
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Keywords

General-Purpose Graphics Processing Unit (GPGPU), Multimedia, H.264/AVC decoder, Parallel Processing, Functional Partitioning, Data Partitioning.