GPU-based JPEG2000 Decoding Scheme for Digital Cinema

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***Abstract*—For the digital cinema system specification released by Digital Cinema Initiatives, it was decided to use 2K or 4K images encoded by the JPEG2000 standard. JPEG2000 provides high compression rates and error tolerance, but it is a burden for both encoding and decoding. To improve the decoding performance, a parallel computing architecture called CUDA has been receiving a lot of attention recently. In this paper, we attempt to realize a real-time JPEG2000 decoding scheme for digital cinema using multiple CPU cores and GPUs. We present CUDA algorithms that perform inverse quantization, inverse 2D discrete wavelet transform and inverse irreversible color transform on a CUDA device, which brings us significant performance gain on a general CPU without extra cost.**

***Keyword*— JPEG2000, CUDA, Digital Cinema, GPU, Parallel Processing, 4K, coalesced memory access**

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