CUDA-based JPEG2000 Encoding Scheme

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***Abstract*— JPEG2000 is the international standard for image compression. The rich feature set and the state of the art image compression performance make JPEG2000 an attractive alternative for many applications. Especially JPEG2000 is used in the area for digital cinema and medical image. Although the JPEG2000 provides high compression rates and error tolerance, it is burden for both encoding and decoding. To improve the 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 encoding scheme by using GPUs. We present CUDA algorithms that perform DCDM decomposition, multi-component transform, 2D discrete wavelet transform, and quantization completely on a CUDA device, which brings us significant performance gain on a general CPU without extra cost. In addition, we present CUDA algorithm for performing the color conversion from RGB to XYZ.**

***Keyword*— JPEG2000, CUDA, GPU, Parallel Processing, NVIDIA**

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