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GPU Power for Medical Imaging

A Practical Approach to General-Purpose Computing,
with CUDA, Machine Learning and Medical Imaging



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The Book addresses the use of Graphic Processor Systems (GPUs) to optimize a preexisting classification algorithm predicated on Support Vector Devices, through parallelization with the NVIDIA CUDA framework. This algorithm can be used for automatic topographic segmentation of gastrointestinal tract video clips, attained through capsule endoscopy found in real Hospital environments. Both approaches granted substantial speedups up to ~7 times with an individual GPU, or more to ~27 times with a cluster of four GPUs. After optimization of the sequential edition of the algorithm, two techniques were compared: 1) the easy use of CUDA libraries, and 2) the development of complete code, both Host and gadget. With the largest video, the classification time transpired from 1h25min to significantly less than two moments, suggesting not only that this was a successful integration, but also that GPUs are very well suited for (and actually be the response to) several current issues that Medicine stumbles upon.



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