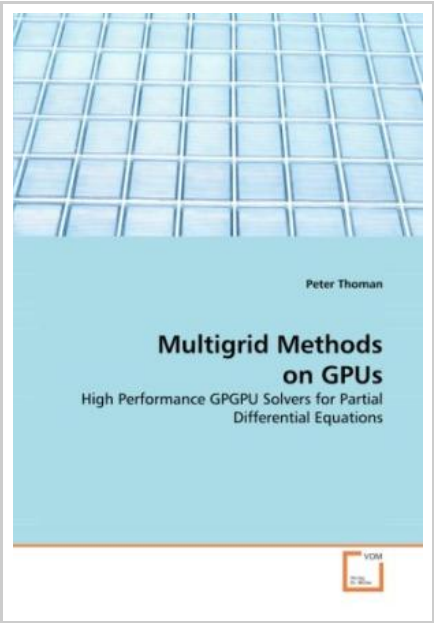

Multigrid Methods on GPUs

By Peter Thoman

VDM Verlag Dr. Müller E.K. Dez 2013, 2013. Taschenbuch. Book Condition: Neu. 220x150x4 mm. Neuware - Many important algorithms in fields such as image processing or physical simulation necessitate solving systems of partial differential equations. Multigrid methods belong to the fastest and most versatile numerical schemes available for this purpose. With the advent of programmable graphics processing units (GPUs) there have been numerous efforts to use their capabilities - massively parallel floating point computation and high memory bandwidth - in high performance computing. In this work, multigrid methods are evaluated for their suitability towards a GPU implementation. After some introductory material on general purpose GPU programming and a short mathematical overview, a multigrid solver for the 2D Poisson equation built on C++, OpenGL and GLSL is presented in detail. The performance of various implementation techniques is benchmarked and interpreted, a number of optimization strategies are tested and the final results are compared across different hardware platforms and to a traditional CPU-based implementation. This book is aimed at scientists and programmers interested in using the potential of GPUs to speed up their multigrid-based numerical solvers. 72 pp. Englisch.

Reviews

An exceptional pdf and the typeface utilized was fascinating to read through. It can be writter in straightforward words and phrases instead of confusing. I am just quickly could possibly get a delight of looking at a written ebook.
-- ***Prof. Arlie Bogan***

It in a single of the best book. This is for those who statte there had not been a well worth reading through. Once you begin to read the book, it is extremely difficult to leave it before concluding.
-- ***Dr. Barney Robel Jr.***