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Scientific computing with CUDA

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Abstract content

We present the fundamental differences between CPUs and GPUs, give examples of GPU programming in CUDA and how simple is to change them to the most general OpenCL language. We show the numerical foundations of our CUDA applications for elliptic, parabolic and hyperbolic partial differential equations, with examples for mesh deformations, pure advection of smooth and discontinuous fields, shallow water equations, flows in porous media and the full Navier-Stokes equations.

Summary

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