Towards Automatic Generation of Energy-aware Efficient Geometric Multigrid Solvers

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1Friedrich-Alexander University Erlangen-Nürnberg (FAU); 2University of Kassel; 3University of Wuppertal; 4University of Passau

ExaStencils

Simulation Science
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Hardware/Software Co-Design
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RESULTS AND GOALS

Overall charter
A tool-assisted fully automated domain-specific design approach for energy-aware stencil codes

Results Achieved:
- Domain-specific language ExaSlang and transformation framework
- Scalability up to full breadth of the JUQUEEN supercomputer
- Low-level optimizations for BlueGene/Q and Intel CPUs
- Performance forecast via product-line sampling and machine learning

Further Goals:
- Exascale technology for a broader range of PDEs
- Energy efficiency at all layers of abstraction
- Performance/power trade-offs on exascale machines
- Exploitation of heterogeneous and hybrid architectures

REFERENCES & ACKNOWLEDGEMENTS


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