Georg Hager

List of Publications by Year
in descending order

112 papers	2,852 citations	331670 21 h-index	315739 38 g-index
118 all docs	118 docs citations	118 times ranked	1904 citing authors

#	Article	IF	Citations
1	LIKWID: A Lightweight Performance-Oriented Tool Suite for x86 Multicore Environments. , 2010, , .		340
2	Hybrid MPI/OpenMP Parallel Programming on Clusters of Multi-Core SMP Nodes. , 2009, , .		245
3	Introduction to High Performance Computing for Scientists and Engineers. , 0, , .		173
4	On the single processor performance of simple lattice Boltzmann kernels. Computers and Fluids, 2006, 35, 910-919.	2.5	167
5	A Unified Sparse Matrix Data Format for Efficient General Sparse Matrix-Vector Multiplication on Modern Processors with Wide SIMD Units. SIAM Journal of Scientific Computing, 2014, 36, C401-C423.	2.8	160
6	Efficient Temporal Blocking for Stencil Computations by Multicore-Aware Wavefront Parallelization. , 2009, , .		77
7	Metallicity in the half-filled Holstein-Hubbard model. Europhysics Letters, 2008, 84, 57001.	2.0	74
8	Comparison of different propagation steps for lattice Boltzmann methods. Computers and Mathematics With Applications, 2013, 65, 924-935.	2.7	72
9	Quantifying Performance Bottlenecks of Stencil Computations Using the Execution-Cache-Memory Model. , 2015, , .		65
10	A Recursive Algebraic Coloring Technique for Hardware-efficient Symmetric Sparse Matrix-vector Multiplication. ACM Transactions on Parallel Computing, 2020, 7, 1-37.	1.4	65
11	Stripe formation in doped Hubbard ladders. Physical Review B, 2005, 71, .	3.2	62
12	Quantum lattice dynamical effects on single-particle excitations in one-dimensional Mott and Peierls insulators. Physical Review B, 2004, 69, .	3.2	57
13	Multicore-Optimized Wavefront Diamond Blocking for Optimizing Stencil Updates. SIAM Journal of Scientific Computing, 2015, 37, C439-C464.	2.8	57
14	Exploring performance and power properties of modern multiâ€core chips via simple machine models. Concurrency Computation Practice and Experience, 2016, 28, 189-210.	2.2	56
15	A flexible Patch-based lattice Boltzmann parallelization approach for heterogeneous GPUâ€“CPU clusters. Parallel Computing, 2011, 37, 536-549.	2.1	49
16	Performance engineering for the lattice Boltzmann method on GPGPUs: Architectural requirements and performance results. Computers and Fluids, 2013, 80, 276-282.	2.5	49
17	Expression Templates Revisited: A Performance Analysis of Current Methodologies. SIAM Journal of Scientific Computing, 2012, 34, C42-C69.	2.8	45
18	Performance analysis and optimization strategies for a D3Q19 lattice Boltzmann kernel on nVIDIA GPUs using CUDA. Advances in Engineering Software, 2011, 42, 266-272.	3.8	42

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19	Parallelization strategies for density matrix renormalization group algorithms on shared-memory systems. Journal of Computational Physics, 2004, 194, 795-808.	3.8	37
20	Efficient multicore-aware parallelization strategies for iterative stencil computations. Journal of Computational Science, 2011, 2, 130-137.	2.9	35
21	Multicore-aware parallel temporal blocking of stencil codes for shared and distributed memory. , 2010, , .		33
22	Sparse Matrix-vector Multiplication on GPGPU Clusters: A New Storage Format and a Scalable Implementation. , 2012, , .		32
23	CRAFT: A Library for Easier Application-Level Checkpoint/Restart and Automatic Fault Tolerance. IEEE Transactions on Parallel and Distributed Systems, 2019, 30, 501-514.	5.6	30
24	Automated Instruction Stream Throughput Prediction for Intel and AMD Microarchitectures. , 2018, , .		29
25	Introducing a parallel cache oblivious blocking approach for the lattice Boltzmann method. Progress in Computational Fluid Dynamics, 2008, 8, 179.	0.2	28
26	High-performance implementation of Chebyshev filter diagonalization for interior eigenvalue computations. Journal of Computational Physics, 2016, 325, 226-243.	3.8	28
27	Introducing a Performance Model for Bandwidth-Limited Loop Kernels. Lecture Notes in Computer Science, 2010, , 615-624.	1.3	28
28	Comparing the performance of different x86 SIMD instruction sets for a medical imaging application on modern multi- and manycore chips. , 2014, , .		27
29	HYBRID-PARALLEL SPARSE MATRIX-VECTOR MULTIPLICATION WITH EXPLICIT COMMUNICATION OVERLAP ON CURRENT MULTICORE-BASED SYSTEMS. Parallel Processing Letters, 2011, 21, 339-358.	0.6	23
30	High performance smart expression template math libraries. , 2012, , .		23
31	GHOST: Building Blocks for High Performance Sparse Linear Algebra on Heterogeneous Systems. International Journal of Parallel Programming, 2017, 45, 1046-1072.	1.5	22
32	Chipâ€level and multiâ€node analysis of energyâ€optimized lattice Boltzmann CFD simulations. Concurrency Computation Practice and Experience, 2016, 28, 2295-2315.	2.2	21
33	Pushing the limits for medical image reconstruction on recent standard multicore processors. International Journal of High Performance Computing Applications, 2013, 27, 162-177.	3.7	20
34	Increasing the Performance of the Jacobi–Davidson Method by Blocking. SIAM Journal of Scientific Computing, 2015, 37, C697-C722.	2.8	20
35	Multidimensional Intratile Parallelization for Memory-Starved Stencil Computations. ACM Transactions on Parallel Computing, 2017, 4, 1-32.	1.4	20
36	Data access optimizations for highly threaded multi-core CPUs with multiple memory controllers. Parallel and Distributed Processing Symposium (IPDPS), Proceedings of the International Conference on, 2008, , .	1.0	19

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37	Quantum Phase Transition in a 1D Transport Model with Boson-Affected Hopping: Luttinger Liquid versus Charge-Density-Wave Behavior. Physical Review Letters, 2009, 102, 106404.	7.8	19
38	Electron confinement in graphene with gate-defined quantum dots. Physica Status Solidi (B): Basic Research, 2015, 252, 1868-1871.	1.5	18
39	Kerncraft: A Tool for Analytic Performance Modeling of Loop Kernels. , 2017, , 1-22.		18
40	LEVERAGING SHARED CACHES FOR PARALLEL TEMPORAL BLOCKING OF STENCIL CODES ON MULTICORE PROCESSORS AND CLUSTERS. Parallel Processing Letters, 2010, 20, 359-376.	0.6	17
41	An Analysis of Core- and Chip-Level Architectural Features in Four Generations of Intel Server Processors. Lecture Notes in Computer Science, 2017, , 294-314.	1.3	16
42	Phase diagram of the spin-Peierls chain with local coupling: Density-matrix renormalization-group calculations and unitary transformations. Physical Review B, 2006, 74, .	3.2	15
43	LIKWID Monitoring Stack: A Flexible Framework Enabling Job Specific Performance monitoring for the masses. , 2017, , .		15
44	BENCHMARK ANALYSIS AND APPLICATION RESULTS FOR LATTICE BOLTZMANN SIMULATIONS ON NEC SX VECTOR AND INTEL NEHALEM SYSTEMS. Parallel Processing Letters, 2009, 19, 491-511.	0.6	14
45	Automatic loop kernel analysis and performance modeling with Kerncraft. , 2015, , .		13
46	On the Accuracy and Usefulness of Analytic Energy Models for Contemporary Multicore Processors. Lecture Notes in Computer Science, 2018, , 22-43.	1.3	13
47	Automatic Throughput and Critical Path Analysis of x86 and ARM Assembly Kernels. , 2019, , .		12
48	LIKWID: Lightweight Performance Tools. , 2011, , 165-175.		12
49	Luttinger liquid versus charge density wave behaviour in the one-dimensional spinless fermion Holstein model. Physica B: Condensed Matter, 2005, 359-361, 699-701.	2.7	11
50	An Evaluation of Different I/O Techniques for Checkpoint/Restart. , 2013, , .		11
51	A SURVEY OF CHECKPOINT/RESTART TECHNIQUES ON DISTRIBUTED MEMORY SYSTEMS. Parallel Processing Letters, 2013, 23, 1340011.	0.6	11
52	Overhead Analysis of Performance Counter Measurements. , 2014, , .		11
53	Performance Engineering of the Kernel Polynomal Method on Large-Scale CPU-GPU Systems. , 2015, , .		11
54	Propagation and Decay of Injected One-Off Delays on Clusters: A Case Study. , 2019, , .		11

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55	Executionâ€Cacheâ€Memory modeling and performance tuning of sparse matrixâ€vector multiplication and Lattice quantum chromodynamics on A64FX. Concurrency Computation Practice and Experience, 2022, 34, e6512.	2.2	11
56	Chebyshev Filter Diagonalization on Modern Manycore Processors and GPGPUs. Lecture Notes in Computer Science, 2018, , 329-349.	1.3	10
57	Benefits from using mixed precision computations in the ELPA-AEO and ESSEX-II eigensolver projects. Japan Journal of Industrial and Applied Mathematics, 2019, 36, 699-717.	0.9	10
58	Performance Patterns and Hardware Metrics on Modern Multicore Processors: Best Practices for Performance Engineering. Lecture Notes in Computer Science, 2013, , 451-460.	1.3	10
59	Analytic performance modeling and analysis of detailed neuron simulations. International Journal of High Performance Computing Applications, 2020, 34, 428-449.	3.7	9
60	Understanding HPC Benchmark Performance on Intel Broadwell andÂCascade Lake Processors. Lecture Notes in Computer Science, 2020, , 412-433.	1.3	9
61	Analysis of Intelâ€™s Haswell Microarchitecture Using the ECM Model and Microbenchmarks. Lecture Notes in Computer Science, 2016, , 210-222.	1.3	9
62	likwid-bench: An Extensible Microbenchmarking Platform for x86 Multicore Compute Nodes. , 2012, , 27-36.		9
63	Performance Modeling of Streaming Kernels and Sparse Matrix-Vector Multiplication on A64FX. , 2020, , .		9
64	Desynchronization and Wave Pattern Formation in MPI-Parallel and Hybrid Memory-Bound Programs. Lecture Notes in Computer Science, 2020, , 391-411.	1.3	8
65	Challenges and Potentials of Emerging Multicore Architectures. , 2009, , 551-566.		8
66	Fast Sparse Matrix-Vector Multiplication for TeraFlop/s Computers. Lecture Notes in Computer Science, 2003, , 287-301.	1.3	7
67	The world's fastest CPU and SMP node: Some performance results from the NEC SX-9. , 2009, , .		7
68	Parallel Sparse Matrix-Vector Multiplication as a Test Case for Hybrid MPI+OpenMP Programming. , 2011, , .		7
69	Analytic Modeling of Idle Waves in Parallel Programs: Communication, Cluster Topology, and Noise Impact. Lecture Notes in Computer Science, 2021, , 351-371.	1.3	7
70	Domain decomposition and locality optimization for large-scale lattice Boltzmann simulations. Computers and Fluids, 2013, 80, 283-289.	2.5	6
71	Optimization of an Electromagnetics Code with Multicore Wavefront Diamond Blocking and Multi-dimensional Intra-Tile Parallelization. , 2016, , .		6
72	Multicore Performance Engineering of Sparse Triangular Solves Using a Modified Roofline Model. , 2018, , .		6

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73	ESSEX: Equipping Sparse Solvers for Exascale. Lecture Notes in Computer Science, 2014, , 577-588.	1.3	6
74	The spin-Peierls chain revisited. Journal of Magnetism and Magnetic Materials, 2007, 310, 1380-1382.	2.3	5
75	Building a Fault Tolerant Application Using the GASPI Communication Layer. , 2015, , .		5
76	Performance Engineering and Energy Efficiency of Building Blocks for Large, Sparse Eigenvalue Computations on Heterogeneous Supercomputers. Lecture Notes in Computational Science and Engineering, 2016, , 317-338.	0.3	5
77	Performance analysis of the Kahanâ€enhanced scalar product on current multiâ€core and manyâ€core processors. Concurrency Computation Practice and Experience, 2017, 29, e3921.	2.2	5
78	Performance engineering for real and complex tall & skinny matrix multiplication kernels on GPUs. International Journal of High Performance Computing Applications, 2021, 35, 5-19.	3.7	5
79	Have the Vectors the Continuing Ability to Parry the Attack of the Killer Micros?. , 2006, , 25-37.		5
80	Direct Numerical Simulation of Turbulent Flow Over Dimples â€“ Code Optimization for NEC SX-8 plus Flow Results. , 2008, , 303-318.		5
81	PHIST. ACM Transactions on Mathematical Software, 2020, 46, 1-26.	2.9	5
82	Performance Limitations for Sparse Matrix-Vector Multiplications on Current Multi-Core Environments. , 2010, , 13-26.		5
83	Optimizing performance on modern HPC systems: learning from simple kernel benchmarks. , 2006, , 273-287.		5
84	Performance Analysis of the Kahan-Enhanced Scalar Product on Current Multicore Processors. Lecture Notes in Computer Science, 2016, , 63-73.	1.3	4
85	Analytic performance model for parallel overlapping memoryâ€bound kernels. Concurrency Computation Practice and Experience, 2022, 34, .	2.2	4
86	Performance of Scientific Applications on Modern Supercomputers. , 2005, , 3-25.		3
87	Carrier-density effects in many-polaron systems. Journal of Physics Condensed Matter, 2007, 19, 255202.	1.8	3
88	Towards an Exascale Enabled Sparse Solver Repository. Lecture Notes in Computational Science and Engineering, 2016, , 295-316.	0.3	3
89	Performance Engineering for a Tall & Skinny Matrix Multiplication Kernels on GPUs. Lecture Notes in Computer Science, 2020, , 505-515.	1.3	3
90	Improved Coefficients for Polynomial Filtering in ESSEX. Lecture Notes in Computational Science and Engineering, 2017, , 63-79.	0.3	3

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91	Vector Computers in a World of Commodity Clusters, Massively Parallel Systems and Many-Core Many-Threaded CPUs: Recent Experience Based on an Advanced Lattice Boltzmann Flow Solver. , 2009, , 333-347.		3
92	Hole-doped Hubbard ladders. Physica B: Condensed Matter, 2006, 378-380, 319-320.	2.7	2
93	Architecture and Performance Characteristics of Modern High Performance Computers. , 2008, , 681-730.		2
94	Domain-Specific Optimization of Two Jacobi Smoother Kernels and Their Evaluation in the ECM Performance Model. Parallel Processing Letters, 2014, 24, 1441004.	0.6	2
95	Building and utilizing fault tolerance support tools for the GASPI applications. International Journal of High Performance Computing Applications, 2018, 32, 613-626.	3.7	2
96	A domain-specific language and matrix-free stencil code for investigating electronic properties of Dirac and topological materials. International Journal of High Performance Computing Applications, 2021, 35, 60-77.	3.7	2
97	Model-guided performance analysis of the sparse matrix-matrix multiplication. , 2013, , .		1
98	YaskSite: Stencil Optimization Techniques Applied to Explicit ODE Methods on Modern Architectures. , 2021, , .		1
99	One-Dimensional Electron-Phonon Systems: Mott- Versus Peierls-Insulators. , 2003, , 339-349.		1
100	Pseudo-Vectorization and RISC Optimization Techniques for the Hitachi SR8000 Architecture. , 2003, , 425-442.		1
101	Validation of Hardware Events for Successful Performance Pattern Identification in High Performance Computing. , 2016, , 17-28.		1
102	Efficient optical simulation of nano structures in thin-film solar cells. , 2018, , .		1
103	ESSEX: Equipping Sparse Solvers For Exascale. Lecture Notes in Computational Science and Engineering, 2020, , 143-187.	0.3	1
104	RZBENCH: Performance Evaluation of Current HPC Architectures Using Low-Level andÂApplication Benchmarks. , 2009, , 485-501.		1
105	Addressing White-box Modeling and Simulation Challenges in Parallel Computing. , 2022, , .		1
106	DMRG Investigation of Stripe Formation in Doped Hubbard Ladders. , 2005, , 339-347.		0
107	Exact Numerical Treatment of Finite Quantum Systems Using Leading-Edge Supercomputers. , 2005, , 165-177.		0
108	DATA ACCESS CHARACTERISTICS AND OPTIMIZATIONS FOR SUN ULTRASPARC T2 AND T2+ SYSTEMS. Parallel Processing Letters, 2008, 18, 471-490.	0.6	0

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109	Luttinger, Peierls or Mott? Quantum Phase Transitions in Strongly Correlated 1D Electronâ€“Phonon Systems. Springer Series in Materials Science, 2010, , 1-21.	0.6	0
110	Performance and power for highly parallel systems. Concurrency Computation Practice and Experience, 2016, 28, 187-188.	2.2	0
111	Performance Engineering: From Numbers to Insight. Lecture Notes in Computer Science, 2013, , 393-394.	1.3	0
112	cxHPC: Setting up ByGRID â€" First Steps Towards an e-Science Infrastructure in Bavaria. , 2005, , 97-102.		0