

Wolfgang Hackbusch

List of Publications by Year in descending order

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109
papers

7,859
citations

94269

37
h-index

51492

86
g-index

114
all docs

114
docs citations

114
times ranked

2809
citing authors

#	ARTICLE	IF	CITATIONS
1	Multi-Grid Methods and Applications. Springer Series in Computational Mathematics, 1985, , .	0.1	1,614
2	A Sparse Matrix Arithmetic Based on \mathcal{H} -Matrices. Part I: Introduction to \mathcal{H} -Matrices. Computing (Vienna/New York), 1999, 62, 89-108.	3.2	934
3	On the fast matrix multiplication in the boundary element method by panel clustering. Numerische Mathematik, 1989, 54, 463-491.	0.9	487
4	Tensor Spaces and Numerical Tensor Calculus. Springer Series in Computational Mathematics, 2012, , .	0.1	354
5	Construction and Arithmetics of \mathcal{H} -Matrices. Computing (Vienna/New York), 2003, 70, 295-334.	3.2	326
6	A New Scheme for the Tensor Representation. Journal of Fourier Analysis and Applications, 2009, 15, 706-722.	0.5	321
7	A Sparse \mathcal{H} -Matrix Arithmetic.. Computing (Vienna/New York), 2000, 64, 21-47.	3.2	319
8	Introduction to hierarchical matrices with applications. Engineering Analysis With Boundary Elements, 2003, 27, 405-422.	2.0	265
9	Elliptic Differential Equations. Springer Series in Computational Mathematics, 1992, , .	0.1	217
10	Existence of \mathcal{H} -matrix approximants to the inverse FE-matrix of elliptic operators with L^2 -coefficients. Numerische Mathematik, 2003, 95, 1-28.	0.9	178
11	Hierarchical Matrices: Algorithms and Analysis. Springer Series in Computational Mathematics, 2015, , .	0.1	176
12	Efficient computation of lead field bases and influence matrix for the FEM-based EEG and MEG inverse problem. Inverse Problems, 2004, 20, 1099-1116.	1.0	130
13	On \mathcal{H}^2 -Matrices. , 2000, , 9-29.		121
14	Composite finite elements for the approximation of PDEs on domains with complicated micro-structures. Numerische Mathematik, 1997, 75, 447-472.	0.9	112
15	\mathcal{H} -matrix approximation of integral operators by interpolation. Applied Numerical Mathematics, 2002, 43, 129-143.	1.2	102
16		1.5	96
17	Low-rank Kronecker-product Approximation to Multi-dimensional Nonlocal Operators. Part I. Separable Approximation of Multi-variate Functions. Computing (Vienna/New York), 2006, 76, 177-202.	3.2	93
18	Hierarchical Kronecker tensor-product approximations. Journal of Numerical Mathematics, 2005, 13, .	1.8	90

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19	Solution of Large Scale Algebraic Matrix Riccati Equations by Use of Hierarchical Matrices. Computing (Vienna/New York), 2003, 70, 121-165.	3.2	89
20	Hierarchical Tensor-Product Approximation to the Inverse and Related Operators for High-Dimensional Elliptic Problems. Computing (Vienna/New York), 2005, 74, 131-157.	3.2	85
21	Approximate iterations for structured matrices. Numerische Mathematik, 2008, 109, 365-383.	0.9	72
22	Minimax approximation for the decomposition of energy denominators in Laplace-transformed Møller-Plesset perturbation theories. Journal of Chemical Physics, 2008, 129, 044112.	1.2	71
23	Tensor-product approximation to operators and functions in high dimensions. Journal of Complexity, 2007, 23, 697-714.	0.7	67
24	Tensor decomposition in post-Hartree-Fock methods. I. Two-electron integrals and MP2. Journal of Chemical Physics, 2011, 134, 054118.	1.2	65
25	Hierarchical Matrices Based on a Weak Admissibility Criterion. Computing (Vienna/New York), 2004, 73, 207-243.	3.2	61
26	A sparse H-matrix arithmetic: general complexity estimates. Journal of Computational and Applied Mathematics, 2000, 125, 479-501.	1.1	60
27	Hierarchische Matrizen. , 2009, , .		59
28	\mathcal{H} -Matrix approximation for the operator exponential with applications. Numerische Mathematik, 2002, 92, 83-111.	0.9	57
29	On numerical cubatures of nearly singular surface integrals arising in BEM collocation. Computing (Vienna/New York), 1994, 52, 139-159.	3.2	48
30	Tensor product approximation with optimal rank in quantum chemistry. Journal of Chemical Physics, 2007, 127, 084110.	1.2	48
31	Hierarchical matrix techniques for low- and high-frequency Helmholtz problems. IMA Journal of Numerical Analysis, 2007, 28, 46-79.	1.5	47
32	Composite finite elements for problems containing small geometric details. Computing and Visualization in Science, 1997, 1, 15-25.	1.2	45
33	Data-sparse approximation to a class of operator-valued functions. Mathematics of Computation, 2004, 74, 681-709.	1.1	44
34	An Introduction to Hierarchical (H-) Rank and TT-Rank of Tensors with Examples. Computational Methods in Applied Mathematics, 2011, 11, 291-304.	0.4	44
35	Iterative Solution of Large Sparse Systems of Equations. Applied Mathematical Sciences (Switzerland), 2016, , .	0.4	44
36	Data-sparse approximation to the operator-valued functions of elliptic operator. Mathematics of Computation, 2003, 73, 1297-1325.	1.1	41

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37	Numerical tensor calculus. <i>Acta Numerica</i> , 2014, 23, 651-742.	6.3	41
38	Wavelet approximation of correlated wave functions. I. Basics. <i>Journal of Chemical Physics</i> , 2002, 116, 9641-9657.	1.2	40
39	Black Box Low Tensor-Rank Approximation Using Fiber-Crosses. <i>Constructive Approximation</i> , 2009, 30, 557-597.	1.8	39
40	Efficient low-rank approximation of the stochastic Galerkin matrix in tensor formats. <i>Computers and Mathematics With Applications</i> , 2014, 67, 818-829.	1.4	38
41	On Minimal Subspaces in Tensor Representations. <i>Foundations of Computational Mathematics</i> , 2012, 12, 765-803.	1.5	35
42	Low-rank Kronecker-product Approximation to Multi-dimensional Nonlocal Operators. Part II. HKT Representation of Certain Operators. <i>Computing (Vienna/New York)</i> , 2006, 76, 203-225.	3.2	34
43	A regularized Newton method for the efficient approximation of tensors represented in the canonical tensor format. <i>Numerische Mathematik</i> , 2012, 122, 489-525.	0.9	30
44	Use of tensor formats in elliptic eigenvalue problems. <i>Numerical Linear Algebra With Applications</i> , 2012, 19, 133-151.	0.9	30
45	Optimization problems in contracted tensor networks. <i>Computing and Visualization in Science</i> , 2011, 14, 271-285.	1.2	29
46	On the Efficient Evaluation of Coalescence Integrals in Population Balance Models. <i>Computing (Vienna/New York)</i> , 2006, 78, 145-159.	3.2	27
47	Variational calculus with sums of elementary tensors of fixed rank. <i>Numerische Mathematik</i> , 2012, 122, 469-488.	0.9	27
48	On the efficient computation of high-dimensional integrals and the approximation by exponential sums. , 2009, , 39-74.		26
49	Direct Schur complement method by domain decomposition based on H-matrix approximation. <i>Computing and Visualization in Science</i> , 2005, 8, 179-188.	1.2	23
50	Wavelet approximation of correlated wave functions. II. Hyperbolic wavelets and adaptive approximation schemes. <i>Journal of Chemical Physics</i> , 2002, 117, 3625-3638.	1.2	21
51	Performance Of H-Lu Preconditioning For Sparse Matrices. <i>Computational Methods in Applied Mathematics</i> , 2008, 8, 336-349.	0.4	21
52	Approximation of coalescence integrals in population balance models with local mass conservation. <i>Numerische Mathematik</i> , 2007, 106, 627-657.	0.9	19
53	The Efficient Computation of Certain Determinants Arising in the Treatment of Schrödinger's Equations. <i>Computing (Vienna/New York)</i> , 2001, 67, 35-56.	3.2	18
54	A numerical method for the simulation of an aggregation-driven population balance system. <i>International Journal for Numerical Methods in Fluids</i> , 2012, 69, 1646-1660.	0.9	17

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55	On the Dirac-Frenkel Variational Principle on Tensor Banach Spaces. Foundations of Computational Mathematics, 2019, 19, 159-204.	1.5	16
56	Tensor representation techniques in post-Hartree-Fock methods: matrix product state tensor format. Molecular Physics, 2013, 111, 2398-2413.	0.8	15
57	Adaptive Geometrically Balanced Clustering of H-Matrices. Computing (Vienna/New York), 2004, 73, 1.	3.2	14
58	Tensor-Product Approximation to Multidimensional Integral Operators and Green's Functions. SIAM Journal on Matrix Analysis and Applications, 2008, 30, 1233-1253.	0.7	14
59	Tensorisation of vectors and their efficient convolution. Numerische Mathematik, 2011, 119, 465-488.	0.9	14
60	Tensor Spaces and Numerical Tensor Calculus. Springer Series in Computational Mathematics, 2019, , .	0.1	14
61	Hierarchical Quadrature for Singular Integrals. Computing (Vienna/New York), 2005, 74, 75-100.	3.2	13
62	Direct Integration of the Newton Potential over Cubes. Computing (Vienna/New York), 2002, 68, 193-216.	3.2	12
63	Fast and exact projected convolution for non-equidistant grids. Computing (Vienna/New York), 2007, 80, 137-168.	3.2	12
64	Preconditioning by inverting the Laplacian: an analysis of the eigenvalues. IMA Journal of Numerical Analysis, 2008, 29, 24-42.	1.5	12
65	Stabilized rounded addition of hierarchical matrices. Numerical Linear Algebra With Applications, 2007, 14, 407-423.	0.9	11
66	-matrix methods for linear and quasi-linear integral operators appearing in population balances. Computers and Chemical Engineering, 2007, 31, 745-759.	2.0	11
67	Efficient convolution with the Newton potential in d dimensions. Numerische Mathematik, 2008, 110, 449-489.	0.9	11
68	On the interconnection between the higher-order singular values of real tensors. Numerische Mathematik, 2017, 135, 875-894.	0.9	11
69	Towards H-Matrix Approximation of Linear Complexity. , 2001, , 194-220.		11
70	Tensor Spaces and Hierarchical Tensor Representations. Lecture Notes in Computational Science and Engineering, 2014, , 237-261.	0.1	11
71	Hybrid Galerkin boundary elements: theory and implementation. Numerische Mathematik, 2000, 86, 139-172.	0.9	10
72	Convolution of hp-functions on locally refined grids. IMA Journal of Numerical Analysis, 2009, 29, 960-985.	1.5	9

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73	Computation of best $\ L^{\infty}\ $ exponential sums for $1/\hat{A}x$ by Remez™ algorithm. Computing and Visualization in Science, 2019, 20, 1-11.	1.2	9
74	Iterative algorithms for the post-processing of high-dimensional data. Journal of Computational Physics, 2020, 410, 109396.	1.9	9
75	Discrete boundary element methods on general meshes in 3D. Numerische Mathematik, 2000, 86, 103-137.	0.9	8
76	Canonical Tensor Products as a Generalization of Gaussian-type Orbitals. Zeitschrift Fur Physikalische Chemie, 2010, 224, 681-694.	1.4	8
77	Tree-based tensor formats. SeMA Journal, 2021, 78, 159-173.	1.0	8
78	$\ L^{\infty}\ $ estimation of tensor truncations. Numerische Mathematik, 2013, 125, 419-440.	0.9	7
79	Solution of linear systems in high spatial dimensions. Computing and Visualization in Science, 2015, 17, 111-118.	1.2	7
80	Survey on the Technique of Hierarchical Matrices. Vietnam Journal of Mathematics, 2016, 44, 71-101.	0.4	7
81	Bridging the gap between quantum Monte Carlo and F12-methods. Chemical Physics, 2012, 401, 36-44.	0.9	6
82	New estimates for the recursive low-rank truncation of block-structured matrices. Numerische Mathematik, 2016, 132, 303-328.	0.9	6
83	Blended kernel approximation in the τ -matrix techniques. Numerical Linear Algebra With Applications, 2002, 9, 281-304.	0.9	5
84	Approximation of $1/\ x^{\sim}y\ $ by Exponentials for Wavelet Applications (Short Communication). Computing (Vienna/New York), 2006, 76, 359-366.	3.2	5
85	Hierarchical Kronecker tensor-product approximations. , 0, .		5
86	Perturbation of Higher-Order Singular Values. SIAM Journal on Applied Algebra and Geometry, 2017, 1, 374-387.	0.9	4
87	Adaptive Galerkin boundary element methods with panel clustering. Numerische Mathematik, 2007, 105, 603-631.	0.9	3
88	τ -matrix methods for quadratic integral operators appearing in population balances. Computers and Chemical Engineering, 2008, 32, 1789-1809.	2.0	3
89	Efficient multi-scale computation of products of orbitals in electronic structure calculations. Computing and Visualization in Science, 2010, 13, 397-408.	1.2	3
90	Coarsening of Boundary-element Spaces. Computing (Vienna/New York), 2006, 77, 253-273.	3.2	2

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91	Optimal Panel-Clustering in the Presence of Anisotropic Mesh Refinement. SIAM Journal on Numerical Analysis, 2008, 46, 517-543.	1.1	2
92	On the efficient convolution with the Newton potential. Journal of Numerical Mathematics, 2010, 18, .	1.8	2
93	Partial evaluation of the discrete solution of elliptic boundary value problems. Computing and Visualization in Science, 2012, 15, 227-245.	1.2	2
94	A Note on Nonclosed Tensor Formats. Vietnam Journal of Mathematics, 2020, 48, 621-631.	0.4	2
95	Truncation of tensors in the hierarchical format. SeMA Journal, 2021, 78, 175-192.	1.0	2
96	Modified Iterations for Data-Sparse Solution of Linear Systems. Vietnam Journal of Mathematics, 2021, 49, 493.	0.4	2
97	Numerical method for elliptic multiscale problems. Journal of Numerical Mathematics, 2008, 16, .	1.8	1
98	Numerical Approximation of Poisson Problems in Long Domains. Vietnam Journal of Mathematics, 0, , 1.	0.4	1
99	Fast Numerical Methods for Non-local Operators. Oberwolfach Reports, 2005, 1, 1747-1788.	0.0	0
100	Schnelle Löser für partielle Differentialgleichungen. Oberwolfach Reports, 2006, 2, 1299-1370.	0.0	0
101	Direct Schur Complement Method by Hierarchical Matrix Techniques. , 2005, , 581-588.		0
102	A projection method for the computation of inner eigenvalues using high degree rational operators. Computing (Vienna/New York), 2007, 81, 259-268.	3.2	0
103	On the robustness of elliptic resolvents computed by means of the technique of hierarchical matrices. Applied Numerical Mathematics, 2008, 58, 1844-1851.	1.2	0
104	Mesh-free canonical tensor products for six-dimensional density matrix: computation of kinetic energy. Computing and Visualization in Science, 2015, 17, 267-275.	1.2	0
105	Numerical Tensor Techniques for Multidimensional Convolution Products. Vietnam Journal of Mathematics, 2019, 47, 69-92.	0.4	0
106	Minimal divergence for border rank-2 tensor approximation. Linear and Multilinear Algebra, 0, , 1-17.	0.5	0
107	Canonical Tensor Products as a Generalization of Gaussian-type Orbitals. , 2010, , 391-404.		0
108	Hierarchical Matrices. , 2015, , 645-647.		0

#	ARTICLE	IF	CITATIONS
109	Fast Projected Convolution of Piecewise Linear Functions on Non-equidistant Grids. , 2008, , 145-160.		0