Yousef Saad

List of Publications by Year
in descending order

133 papers	12,915 citations	37 h-index 94433
		74 g-index 76900
136 all docs	136 docs citations	136 times ranked
		7547 citing authors

#	Article	IF	Citations
1	ILUT: A dual threshold incomplete LU factorization. Numerical Linear Algebra With Applications, 1994, 1, 387-402.	1.6	530
2	Iterative solution of linear systems in the 20th century. Journal of Computational and Applied Mathematics, 2000, 123, 1-33.	2.0	333
3	PARSEC â€" the pseudopotential algorithm for real-space electronic structure calculations: recent advances and novel applications to nano-structures. Physica Status Solidi (B): Basic Research, 2006, 243, 1063-1079.	1.5	285
4	Turbo charging time-dependent density-functional theory with Lanczos chains. Journal of Chemical Physics, 2008, 128, 154105.	3.0	234
5	Numerical Methods for Electronic Structure Calculations of Materials. SIAM Review, 2010, 52, 3-54.	9.5	231
6	GPU-accelerated preconditioned iterative linear solvers. Journal of Supercomputing, 2013, 63, 443-466.	3.6	196
7	Approximate Inverse Preconditioners via Sparse-Sparse Iterations. SIAM Journal of Scientific Computing, 1998, 19, 995-1023.	2.8	191
8	Experimental study of ILU preconditioners for indefinite matrices. Journal of Computational and Applied Mathematics, 1997, 86, 387-414.	2.0	188
9	Dense Subgraph Extraction with Application to Community Detection. IEEE Transactions on Knowledge and Data Engineering, 2012, 24, 1216-1230.	5.7	186
10	Two classes of multisecant methods for nonlinear acceleration. Numerical Linear Algebra With Applications, 2009, 16, 197-221.	1.6	183
11	Self-consistent-field calculations using Chebyshev-filtered subspace iteration. Journal of Computational Physics, 2006, 219, 172-184.	3.8	152
12	Parallel self-consistent-field calculations via Chebyshev-filtered subspace acceleration. Physical Review E, 2006, 74, 066704.	2.1	145
13	Deflated and Augmented Krylov Subspace Techniques. Numerical Linear Algebra With Applications, 1997, 4, 43-66.	1.6	136
14	Multilevel Preconditioners Constructed From Inverse-Based ILUs. SIAM Journal of Scientific Computing, 2006, 27, 1627-1650.	2.8	107
15	Distributed Schur Complement Techniques for General Sparse Linear Systems. SIAM Journal of Scientific Computing, 1999, 21, 1337-1356.	2.8	104
16	A spectrum slicing method for the Kohnâ€"Sham problem. Computer Physics Communications, 2012, 183, 497-505.	7.5	98
17	Analysis of Augmented Krylov Subspace Methods. SIAM Journal on Matrix Analysis and Applications, 1997, 18, 435-449.	1.4	93
18	Dynamic Thick Restarting of the Davidson, and the Implicitly Restarted Arnoldi Methods. SIAM Journal of Scientific Computing, 1998, 19, 227-245.	2.8	92

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19	pARMS: a parallel version of the algebraic recursive multilevel solver. Numerical Linear Algebra With Applications, 2003, 10, 485-509.	1.6	91
20	Crout Versions of ILU for General Sparse Matrices. SIAM Journal of Scientific Computing, 2003, 25, 716-728.	2.8	90
21	A probing method for computing the diagonal of a matrix inverse. Numerical Linear Algebra With Applications, 2012, 19, 485-501.	1.6	87
22	Approximating Spectral Densities of Large Matrices. SIAM Review, 2016, 58, 34-65.	9.5	84
23	Evolution of Magnetism in Iron from the Atom to the Bulk. Physical Review Letters, 2006, 97, 147201.	7.8	82
24	Approximate Inverse Techniques for Block-Partitioned Matrices. SIAM Journal of Scientific Computing, 1997, 18, 1657-1675.	2.8	77
25	BILUM: Block Versions of Multielimination and Multilevel ILU Preconditioner for General Sparse Linear Systems. SIAM Journal of Scientific Computing, 1999, 20, 2103-2121.	2.8	76
26	Krylov subspace methods for computing hydrodynamic interactions in Brownian dynamics simulations. Journal of Chemical Physics, 2012, 137, 064106.	3.0	69
27	Fast Estimation of $tr(f(A))$ via Stochastic Lanczos Quadrature. SIAM Journal on Matrix Analysis and Applications, 2017, 38, 1075-1099.	1.4	66
28	Efficient estimation of eigenvalue counts in an interval. Numerical Linear Algebra With Applications, 2016, 23, 674-692.	1.6	63
29	BILUTM: A Domain-Based Multilevel Block ILUT Preconditioner for General Sparse Matrices. SIAM Journal on Matrix Analysis and Applications, 1999, 21, 279-299.	1.4	62
30	Chebyshev-filtered subspace iteration method free of sparse diagonalization for solving the Kohn–Sham equation. Journal of Computational Physics, 2014, 274, 770-782.	3.8	57
31	An arbitrary Lagrangian-Eulerian finite element method for solving three-dimensional free surface flows. Computer Methods in Applied Mechanics and Engineering, 1998, 162, 79-106.	6.6	53
32	A Filtered Lanczos Procedure for Extreme and Interior Eigenvalue Problems. SIAM Journal of Scientific Computing, 2012, 34, A2220-A2246.	2.8	46
33	Overlapping Domain Decomposition Algorithms for General Sparse Matrices. Numerical Linear Algebra With Applications, 1996, 3, 221-237.	1.6	45
34	Preconditioning Helmholtz linear systems. Applied Numerical Mathematics, 2010, 60, 420-431.	2.1	45
35	Preconditioned Krylov Subspace Methods for Sampling Multivariate Gaussian Distributions. SIAM Journal of Scientific Computing, 2014, 36, A588-A608.	2.8	45
36	A Chebyshev–Davidson Algorithm for Large Symmetric Eigenproblems. SIAM Journal on Matrix Analysis and Applications, 2007, 29, 954-971.	1.4	43

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37	A Thick-Restart Lanczos Algorithm with Polynomial Filtering for Hermitian Eigenvalue Problems. SIAM Journal of Scientific Computing, 2016, 38, A2512-A2534.	2.8	38
38	Shanks Sequence Transformations and Anderson Acceleration. SIAM Review, 2018, 60, 646-669.	9.5	38
39	On the Relations between ILUs and Factored Approximate Inverses. SIAM Journal on Matrix Analysis and Applications, 2002, 24, 219-237.	1.4	36
40	Parallel implementation of time-dependent density functional theory. Computer Physics Communications, 2003, 156, 22-42.	7.5	36
41	A Parallel Multistage ILU Factorization Based on a Hierarchical Graph Decomposition. SIAM Journal of Scientific Computing, 2006, 28, 2266-2293.	2.8	36
42	Electronic structure calculations for plane-wave codes without diagonalization. Computer Physics Communications, 1999, 118, 21-30.	7.5	35
43	Multilevel ILU With Reorderings for Diagonal Dominance. SIAM Journal of Scientific Computing, 2005, 27, 1032-1057.	2.8	35
44	Efficient Algorithms for Estimating the Absorption Spectrum within Linear Response TDDFT. Journal of Chemical Theory and Computation, 2015, 11, 5197-5208.	5.3	35
45	Computation of Smallest Eigenvalues using Spectral Schur Complements. SIAM Journal of Scientific Computing, 2005, 27, 458-481.	2.8	34
46	Robust preconditioning of large, sparse, symmetric eigenvalue problems. Journal of Computational and Applied Mathematics, 1995, 64, 197-215.	2.0	32
47	Block Krylov–Schur method for large symmetric eigenvalue problems. Numerical Algorithms, 2008, 47, 341-359.	1.9	31
48	Lanczos Vectors versus Singular Vectors for Effective Dimension Reduction. IEEE Transactions on Knowledge and Data Engineering, 2009, 21, 1091-1103.	5.7	31
49	Preconditioning techniques for the solution of the Helmholtz equation by the finite element method. Mathematics and Computers in Simulation, 2004, 65, 303-321.	4.4	30
50	High-order ILU preconditioners for CFD problems. International Journal for Numerical Methods in Fluids, 2000, 33, 767-788.	1.6	29
51	Computing $f(A)b$ via Least Squares Polynomial Approximations. SIAM Journal of Scientific Computing, 2011, 33, 195-222.	2.8	28
52	SMASH: Structured matrix approximation by separation and hierarchy. Numerical Linear Algebra With Applications, 2018, 25, e2204.	1.6	27
53	MIQR: A Multilevel Incomplete QR Preconditioner for Large Sparse Least–Squares Problems. SIAM Journal on Matrix Analysis and Applications, 2006, 28, 524-550.	1.4	26
54	An Algebraic Multilevel Preconditioner with Low-Rank Corrections for Sparse Symmetric Matrices. SIAM Journal on Matrix Analysis and Applications, 2016, 37, 235-259.	1.4	26

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55	DQGMRES: a Direct Quasi-minimal Residual Algorithm Based on Incomplete Orthogonalization. Numerical Linear Algebra With Applications, 1996, 3, 329-343.	1.6	25
56	Computation of Large Invariant Subspaces Using Polynomial Filtered Lanczos Iterations with Applications in Density Functional Theory. SIAM Journal on Matrix Analysis and Applications, 2008, 30, 397-418.	1.4	25
57	Computing charge densities with partially reorthogonalized Lanczos. Computer Physics Communications, 2005, 171, 175-186.	7.5	24
58	Divide and Conquer Low-Rank Preconditioners for Symmetric Matrices. SIAM Journal of Scientific Computing, 2013, 35, A2069-A2095.	2.8	24
59	Enhanced GMRES Acceleration Techniques for some CFD Problems. International Journal of Computational Fluid Dynamics, 2002, 16, 1-20.	1.2	23
60	Filtered Conjugate Residual–type Algorithms with Applications. SIAM Journal on Matrix Analysis and Applications, 2006, 28, 845-870.	1.4	23
61	The Eigenvalues Slicing Library (EVSL): Algorithms, Implementation, and Software. SIAM Journal of Scientific Computing, 2019, 41, C393-C415.	2.8	23
62	Enhanced multi-level block ILU preconditioning strategies for general sparse linear systems. Journal of Computational and Applied Mathematics, 2001, 130, 99-118.	2.0	22
63	A Greedy Strategy for Coarse-Grid Selection. SIAM Journal of Scientific Computing, 2007, 29, 1825-1853.	2.8	22
64	Schur complement–based domain decomposition preconditioners with low–rank corrections. Numerical Linear Algebra With Applications, 2016, 23, 706-729.	1.6	21
65	ILUS: An incomplete LU preconditioner in sparse skyline format. International Journal for Numerical Methods in Fluids, 1997, 25, 739-748.	1.6	20
66	Finding Exact and Approximate Block Structures for ILU Preconditioning. SIAM Journal of Scientific Computing, 2003, 24, 1107-1123.	2.8	20
67	Computing Partial Spectra with Least-Squares Rational Filters. SIAM Journal of Scientific Computing, 2016, 38, A3020-A3045.	2.8	20
68	Improving the Incoherence of a Learned Dictionary via Rank Shrinkage. Neural Computation, 2017, 29, 263-285.	2.2	19
69	Deflated and Augmented Krylov Subspace Techniques. Numerical Linear Algebra With Applications, 1997, 4, 43-66.	1.6	19
70	Diagonal threshold techniques in robust multi-level ILU preconditioners for general sparse linear systems. Numerical Linear Algebra With Applications, 1999, 6, 257-280.	1.6	18
71	Efficient first-principles calculations of the electronic structure of periodic systems. Computer Physics Communications, 2007, 177, 339-347.	7.5	18
72	Low-Rank Correction Methods for Algebraic Domain Decomposition Preconditioners. SIAM Journal on Matrix Analysis and Applications, 2017, 38, 807-828.	1.4	18

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73	Analysis of Subspace Iteration for Eigenvalue Problems with Evolving Matrices. SIAM Journal on Matrix Analysis and Applications, 2016, 37, 103-122.	1.4	17
74	A Factored Approximate Inverse Preconditioner with Pivoting. SIAM Journal on Matrix Analysis and Applications, 2002, 23, 692-705.	1.4	15
75	Incremental incomplete LU factorizations with applications. Numerical Linear Algebra With Applications, 2010, 17, 811-837.	1.6	15
76	Harnessing molecular excited states with Lanczos chains. Journal of Physics Condensed Matter, 2010, 22, 074204.	1.8	15
77	An edge based stabilized finite element method for solving compressible flows: formulation and parallel implementation. Computer Methods in Applied Mechanics and Engineering, 2001, 190, 6735-6761.	6.6	14
78	Domain-Decomposition-Type Methods for Computing the Diagonal of a Matrix Inverse. SIAM Journal of Scientific Computing, 2011, 33, 2823-2847.	2.8	14
79	Overlapping Domain Decomposition Algorithms for General Sparse Matrices. Numerical Linear Algebra With Applications, 1996, 3, 221-237.	1.6	14
80	Rational approximation to the Fermiâ€"Dirac function with applications in density functional theory. Numerical Algorithms, 2011, 56, 455-479.	1.9	13
81	Matrix Reordering Using Multilevel Graph Coarsening for ILU Preconditioning. SIAM Journal of Scientific Computing, 2015, 37, A391-A419.	2.8	13
82	Further analysis of minimum residual iterations. Numerical Linear Algebra With Applications, 2000, 7, 67-93.	1.6	12
83	PFEAST: A High Performance Sparse Eigenvalue Solver Using Distributed-Memory Linear Solvers. , 2016, , .		12
84	Fast Estimation of Approximate Matrix Ranks Using Spectral Densities. Neural Computation, 2017, 29, 1317-1351.	2.2	12
85	Computing Planetary Interior Normal Modes with a Highly Parallel Polynomial Filtering Eigensolver. , 2018, , .		12
86	Block LU Preconditioners for Symmetric and Nonsymmetric Saddle Point Problems. SIAM Journal of Scientific Computing, 2003, 25, 729-748.	2.8	11
87	SchurRAS: A Restricted Version of the Overlapping Schur Complement Preconditioner. SIAM Journal of Scientific Computing, 2006, 27, 1787-1801.	2.8	11
88	Graph-Based Multilevel Dimensionality Reduction with Applications to Eigenfaces and Latent Semantic Indexing. , 2008, , .		11
89	Diagonalization methods in PARSEC. Physica Status Solidi (B): Basic Research, 2006, 243, 2188-2197.	1.5	10
90	Modification and Compensation Strategies for Threshold-based Incomplete Factorizations. SIAM Journal of Scientific Computing, 2012, 34, A48-A75.	2.8	10

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91	Prewhitening High-Dimensional fMRI Data Sets Without Eigendecomposition. Neural Computation, 2014, 26, 907-919.	2.2	10
92	Cucheb: A GPU implementation of the filtered Lanczos procedure. Computer Physics Communications, 2017, 220, 332-340.	7.5	10
93	Domain decomposition approaches for accelerating contour integration eigenvalue solvers for symmetric eigenvalue problems. Numerical Linear Algebra With Applications, 2018, 25, e2154.	1.6	10
94	Algorithms for the electronic and vibrational properties of nanocrystals. Journal of Physics Condensed Matter, 2009, 21, 064207.	1.8	9
95	Fast Computation of Spectral Densities for Generalized Eigenvalue Problems. SIAM Journal of Scientific Computing, 2018, 40, A2749-A2773.	2.8	9
96	Beyond Automated Multilevel Substructuring: Domain Decomposition with Rational Filtering. SIAM Journal of Scientific Computing, 2018, 40, C477-C502.	2.8	9
97	Solving the Three-Dimensional High-frequency Helmholtz Equation Using Contour Integration and Polynomial Preconditioning. SIAM Journal on Matrix Analysis and Applications, 2020, 41, 58-82.	1.4	9
98	Graph coarsening: from scientific computing to machine learning. SeMA Journal, 2022, 79, 187-223.	2.0	9
99	On correction equations and domain decomposition for computing invariant subspaces. Computer Methods in Applied Mechanics and Engineering, 2007, 196, 1471-1483.	6.6	8
100	Algorithms for the evolution of electronic properties in nanocrystals. Computer Physics Communications, 2007, 177, 1-5.	7.5	8
101	A Rational Function Preconditioner For Indefinite Sparse Linear Systems. SIAM Journal of Scientific Computing, 2017, 39, A1145-A1167.	2.8	8
102	Non-standard Parallel Solution Strategies for Distributed Sparse Linear Systems. Lecture Notes in Computer Science, 1999, , 13-27.	1.3	8
103	Variations on algebraic recursive multilevel solvers (ARMS) for the solution of CFD problems. Applied Numerical Mathematics, 2004, 51, 305-327.	2.1	7
104	Greedy Coarsening Strategies for Nonsymmetric Problems. SIAM Journal of Scientific Computing, 2007, 29, 2115-2143.	2.8	7
105	A Hierarchical Low Rank Schur Complement Preconditioner for Indefinite Linear Systems. SIAM Journal of Scientific Computing, 2018, 40, A2234-A2252.	2.8	7
106	Multilevel manifold learning with application to spectral clustering. , 2010, , .		6
107	Efficient computation of the coupling matrix in time-dependent density functional theory. Computer Physics Communications, 2005, 167, 7-22.	7.5	5
108	Sampling and multilevel coarsening algorithms for fast matrix approximations. Numerical Linear Algebra With Applications, 2019, 26, e2234.	1.6	5

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109	A Power Schur Complement Low-Rank Correction Preconditioner for General Sparse Linear Systems. SIAM Journal on Matrix Analysis and Applications, 2021, 42, 659-682.	1.4	5
110	Divide and Conquer Strategies for Effective Information Retrieval. , 2009, , .		4
111	Spectral recycling strategies for the solution of nonlinear eigenproblems in thermoacoustics. Numerical Linear Algebra With Applications, 2015, 22, 1039-1058.	1.6	4
112	A posteriori error estimate for computing $tr(f(A))$ by using the Lanczos method. Numerical Linear Algebra With Applications, 2018, 25, e2170.	1.6	4
113	Proxy-GMRES: Preconditioning via GMRES in Polynomial Space. SIAM Journal on Matrix Analysis and Applications, 2021, 42, 1248-1267.	1.4	4
114	Shanks and Anderson-type acceleration techniques for systems of nonlinear equations. IMA Journal of Numerical Analysis, 2022, 42, 3058-3093.	2.9	4
115	Iterative solution of linear systems in the 20th century. , 2001, , 175-207.		4
116	Preconditioning strategies for linear systems arising in tire design. Numerical Linear Algebra With Applications, 2000, 7, 743-757.	1.6	3
117	Hypergraph-based multilevel matrix approximation for text information retrieval. , 2010, , .		3
118	Fast Updating Algorithms for Latent Semantic Indexing. SIAM Journal on Matrix Analysis and Applications, 2014, 35, 1105-1131.	1.4	3
119	Low rank approximation and decomposition of large matrices using error correcting codes. IEEE Transactions on Information Theory, 2017, , 1-1.	2.4	3
120	Applications of Trace Estimation Techniques. Lecture Notes in Computer Science, 2018, , 19-33.	1.3	3
121	Multicolor lowâ€rank preconditioner for general sparse linear systems. Numerical Linear Algebra With Applications, 2020, 27, e2316.	1.6	2
122	Planetary Normal Mode Computation: Parallel Algorithms, Performance, and Reproducibility. IEEE Transactions on Parallel and Distributed Systems, 2021, 32, 2609-2622.	5.6	2
123	Highâ€order ILU preconditioners for CFD problems. International Journal for Numerical Methods in Fluids, 2000, 33, 767-788.	1.6	2
124	Schur Complement Preconditioners for Distributed General Sparse Linear Systems. , 2007, , 127-138.		2
125	A Non-perturbative Approach to Computing Seismic Normal Modes in Rotating Planets. Journal of Scientific Computing, 2022, 91, 1.	2.3	2
126	Using Chebyshev-Filtered Subspace Iteration and Windowing Methods to Solve the Kohn-Sham Problem. , 2011, , 167-189.		1

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127	Find the dimension that counts: Fast dimension estimation and Krylov PCA. , 2019, , 720-728.		1
128	ILUS: An incomplete LU preconditioner in sparse skyline format. International Journal for Numerical Methods in Fluids, 1997, 25, 739-748.	1.6	1
129	Rational approximation preconditioners for sparse linear systems. Journal of Computational and Applied Mathematics, 2003, 158, 419-442.	2.0	0
130	Spectrum-Adapted Polynomial Approximation for Matrix Functions with Applications in Graph Signal Processing. Algorithms, 2020, 13, 295.	2.1	0
131	Preconditionning Techniques for the Solution of the Helmholtz Equation by the Finite Element Method. Lecture Notes in Computer Science, 2003, , 847-858.	1.3	0
132	Applying Parallel Direct Solver Techniques to Build Robust High Performance Preconditioners. Lecture Notes in Computer Science, 2006, , 611-619.	1.3	0
133	Fast Methods for Large Eigenvalues Problems for Chemistry. , 2015, , 493-498.		0