Xiao-Chuan Cai

List of Publications by Year
in descending order

119 papers	2,942 citations	201385 27 h-index	182168 51 g-index
124 all docs	124 docs citations	124 times ranked	1119 citing authors

#	ARTICLE	IF	CITATIONS
1	A Restricted Additive Schwarz Preconditioner for General Sparse Linear Systems. SIAM Journal of Scientific Computing, 1999, 21, 792-797.	1.3	443
2	Nonlinearly Preconditioned Inexact Newton Algorithms. SIAM Journal of Scientific Computing, 2002, 24, 183-200.	1.3	161
3	Domain Decomposition Algorithms for Indefinite Elliptic Problems. SIAM Journal on Scientific and Statistical Computing, 1992, 13, 243-258.	1.5	150
4	Additive Schwarz algorithms for parabolic convection-diffusion equations. Numerische Mathematik, 1991, 60, 41-61.	0.9	149
5	Parallel Newton--Krylov--Schwarz Algorithms for the Transonic Full Potential Equation. SIAM Journal of Scientific Computing, 1998, 19, 246-265.	1.3	112
6	Multiplicative Schwarz Methods for Parabolic Problems. SIAM Journal of Scientific Computing, 1994, 15, 587-603.	1.3	107
7	Scalable parallel methods for monolithic coupling in fluid–structure interaction with application to blood flow modeling. Journal of Computational Physics, 2010, 229, 642-659.	1.9	99
8	Multiplicative Schwarz Algorithms for Some Nonsymmetric and Indefinite Problems. SIAM Journal on Numerical Analysis, 1993, 30, 936-952.	1.1	78
9	A fully implicit parallel algorithm for simulating the non-linear electrical activity of the heart. Numerical Linear Algebra With Applications, 2004, 11, 261-277.	0.9	76
10	A parallel nonlinear additive Schwarz preconditioned inexact Newton algorithm for incompressible Navier–Stokes equations. Journal of Computational Physics, 2005, 204, 666-691.	1.9	66
11	A fully implicit domain decomposition based ALE framework for three-dimensional fluid–structure interaction with application in blood flow computation. Journal of Computational Physics, 2014, 258, 524-537.	1.9	64
12	Non-linear additive Schwarz preconditioners and application in computational fluid dynamics. International Journal for Numerical Methods in Fluids, 2002, 40, 1463-1470.	0.9	55
13	Restricted Additive Schwarz Preconditioners with Harmonic Overlap for Symmetric Positive Definite Linear Systems. SIAM Journal on Numerical Analysis, 2003, 41, 1209-1231.	1.1	52
14	A preconditioned GMRES method for nonsymmetric or indefinite problems. Mathematics of Computation, 1992, 59, 311-311.	1.1	47
15	Overlapping Domain Decomposition Algorithms for General Sparse Matrices. Numerical Linear Algebra With Applications, 1996, 3, 221-237.	0.9	45
16	Overlapping Nonmatching Grid Mortar Element Methods for Elliptic Problems. SIAM Journal on Numerical Analysis, 1999, 36, 581-606.	1.1	45
17	Parallel Full Space SQP Lagrange--Newton--Krylov--Schwarz Algorithms for PDE-Constrained Optimization Problems. SIAM Journal of Scientific Computing, 2006, 27, 1305-1328.	1.3	45
18	Functional assessment of cerebral artery stenosis: A pilot study based on computational fluid dynamics. Journal of Cerebral Blood Flow and Metabolism, 2017, 37, 2567-2576.	2.4	42

#	Article	IF	Citations
19	A class of parallel two-level nonlinear Schwarz preconditioned inexact Newton algorithms. Computer Methods in Applied Mechanics and Engineering, 2007, 196, 1603-1611.	3.4	39
20	A Fully Implicit Domain Decomposition Algorithm for Shallow Water Equations on the Cubed-Sphere. SIAM Journal of Scientific Computing, 2010, 32, 418-438.	1.3	37
21	A Scalable Fully Implicit Compressible Euler Solver for Mesoscale Nonhydrostatic Simulation of Atmospheric Flows. SIAM Journal of Scientific Computing, 2014, 36, S23-S47.	1.3	36
22	Inexact Newton Methods with Restricted Additive Schwarz Based Nonlinear Elimination for Problems with High Local Nonlinearity. SIAM Journal of Scientific Computing, 2011, 33, 746-762.	1.3	35
23	A Highly Scalable Multilevel Schwarz Method with Boundary Geometry Preserving Coarse Spaces for 3D Elasticity Problems on Domains with Complex Geometry. SIAM Journal of Scientific Computing, 2016, 38, C73-C95.	1.3	35
24	A comparison of some domain decomposition and ILU preconditioned iterative methods for nonsymmetric elliptic problems. Numerical Linear Algebra With Applications, 1994, 1, 477-504.	0.9	31
25	Parallel multilevel methods for implicit solution of shallow water equations with nonsmooth topography on the cubed-sphere. Journal of Computational Physics, 2011, 230, 2523-2539.	1.9	30
26	A scalable nonlinear fluidâ€"structure interaction solver based on a Schwarz preconditioner with isogeometric unstructured coarse spaces in 3D. Journal of Computational Physics, 2017, 340, 498-518.	1.9	29
27	H^1 -Norm Error Bounds for Piecewise Hermite Bicubic Orthogonal Spline Collocation Schemes for Elliptic Boundary Value Problems. SIAM Journal on Numerical Analysis, 1994, 31, 1128-1146.	1.1	27
28	Two-Level Newton and Hybrid Schwarz Preconditioners for Fluid-Structure Interaction. SIAM Journal of Scientific Computing, 2010, 32, 2395-2417.	1.3	27
29	Nonlinear Preconditioning Techniques for Full-Space Lagrange--Newton Solution of PDE-Constrained Optimization Problems. SIAM Journal of Scientific Computing, 2016, 38, A2756-A2778.	1.3	27
30	The Use of Pointwise Interpolation in Domain Decomposition Methods with Nonnested Meshes. SIAM Journal of Scientific Computing, 1995, 16, 250-256.	1.3	24
31	An efficient finite element method for simulation of droplet spreading on a topologically rough surface. Journal of Computational Physics, 2017, 349, 233-252.	1.9	23
32	Numerical solution for consolidation and desiccation of soft soils. International Journal for Numerical and Analytical Methods in Geomechanics, 2002, 26, 139-161.	1.7	22
33	Simulation of unsteady blood flows in a patientâ€specific compliant pulmonary artery with a highly parallel monolithically coupled fluidâ€structure interaction algorithm. International Journal for Numerical Methods in Biomedical Engineering, 2019, 35, e3208.	1.0	22
34	Additive Schwarz-based fully coupled implicit methods for resistive Hall magnetohydrodynamic problems. Journal of Computational Physics, 2007, 225, 1919-1936.	1.9	21
35	An efficient parallel simulation of unsteady blood flows in patientâ€specific pulmonary artery. International Journal for Numerical Methods in Biomedical Engineering, 2018, 34, e2952.	1.0	21
36	A nonlinear elimination preconditioned inexact Newton method for blood flow problems in human artery with stenosis. Journal of Computational Physics, 2019, 399, 108926.	1.9	21

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37	An Optimal Two-Level Overlapping Domain Decomposition Method for Elliptic Problems in Two and Three Dimensions. SIAM Journal of Scientific Computing, 1993, 14, 239-247.	1.3	20
38	A parallel adaptive nonlinear elimination preconditioned inexact Newton method for transonic full potential equation. Computers and Fluids, 2015, 110, 96-107.	1.3	20
39	Efficient parallel simulation of hemodynamics in patient-specific abdominal aorta with aneurysm. Computers in Biology and Medicine, 2021, 136, 104652.	3.9	20
40	Parallel Domain Decomposition Methods for Stochastic Elliptic Equations. SIAM Journal of Scientific Computing, 2007, 29, 2096-2114.	1.3	19
41	Two-Level Space–Time Domain Decomposition Methods for Three-Dimensional Unsteady Inverse Source Problems. Journal of Scientific Computing, 2016, 67, 860-882.	1.1	19
42	Parallel One-Shot Lagrange--Newton--Krylov--Schwarz Algorithms for Shape Optimization of Steady Incompressible Flows. SIAM Journal of Scientific Computing, 2012, 34, B584-B605.	1.3	18
43	Fully implicit Lagrange–Newton–Krylov–Schwarz algorithms for boundary control of unsteady incompressible flows. International Journal for Numerical Methods in Engineering, 2012, 91, 644-665.	1.5	18
44	A Fully Implicit Method for Lattice Boltzmann Equations. SIAM Journal of Scientific Computing, 2015, 37, S291-S313.	1.3	18
45	A Nonlinearly Preconditioned Inexact Newton Algorithm for Steady State Lattice Boltzmann Equations. SIAM Journal of Scientific Computing, 2016, 38, A1701-A1724.	1.3	18
46	Fully implicit hybrid two-level domain decomposition algorithms for two-phase flows in porous media on 3D unstructured grids. Journal of Computational Physics, 2020, 409, 109312.	1.9	18
47	Maximum Norm Analysis of Overlapping Nonmatching Grid Discretizations of Elliptic Equations. SIAM Journal on Numerical Analysis, 2000, 37, 1709-1728.	1.1	17
48	A parallel two-level method for simulating blood flows in branching arteries with the resistive boundary condition. Computers and Fluids, 2011, 45, 92-102.	1.3	17
49	Fusing 2D and 3D convolutional neural networks for the segmentation of aorta and coronary arteries from CT images. Artificial Intelligence in Medicine, 2021, 121, 102189.	3.8	16
50	A parallel space-time domain decomposition method for unsteady source inversion problems. Inverse Problems and Imaging, 2015, 9, 1069-1091.	0.6	15
51	A Parallel Domain Decomposition Method for 3D Unsteady Incompressible Flows at High Reynolds Number. Journal of Scientific Computing, 2014, 58, 275-289.	1.1	14
52	Overlapping Domain Decomposition Algorithms for General Sparse Matrices. Numerical Linear Algebra With Applications, 1996, 3, 221-237.	0.9	14
53	Scalability study of an implicit solver for coupled fluid-structure interaction problems on unstructured meshes in 3D. International Journal of High Performance Computing Applications, 2018, 32, 207-219.	2.4	13
54	A parallel non–nested two–level domain decomposition method for simulating blood flows in cerebral artery of stroke patient. International Journal for Numerical Methods in Biomedical Engineering, 2020, 36, e3392.	1.0	13

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55	Convergence Analysis of Two-Level Space-Time Additive Schwarz Method for Parabolic Equations. SIAM Journal on Numerical Analysis, 2015, 53, 2727-2751.	1.1	12
56	A parallel domain decomposition-based implicit method for the Cahn–Hilliard–Cook phase-field equation in 3D. Journal of Computational Physics, 2015, 285, 55-70.	1.9	12
57	Multilevel Space-Time Additive Schwarz Methods for Parabolic Equations. SIAM Journal of Scientific Computing, 2018, 40, A3012-A3037.	1.3	12
58	Implicit Space-Time Domain Decomposition Methods for Stochastic Parabolic Partial Differential Equations. SIAM Journal of Scientific Computing, 2014, 36, C1-C24.	1.3	10
59	Nonlinear Preconditioning Strategies for Two-Phase Flows in Porous Media Discretized by a Fully Implicit Discontinuous Galerkin Method. SIAM Journal of Scientific Computing, 2021, 43, S317-S344.	1.3	10
60	One-level Newton-Krylov-Schwarz algorithm for unsteady non-linear radiation diffusion problem. Numerical Linear Algebra With Applications, 2004, 11, 867-881.	0.9	9
61	Parallel Performance of Some Two-Level ASPIN Algorithms. , 2005, , 639-646.		9
62	Parallel Domain Decomposition Methods with Mixed Order Discretization for Fully Implicit Solution of Tracer Transport Problems on the Cubed-Sphere. Journal of Scientific Computing, 2014, 61, 258-280.	1.1	9
63	Two-Level Space–Time Domain Decomposition Methods for Flow Control Problems. Journal of Scientific Computing, 2017, 70, 717-743.	1.1	9
64	A Nonlinear Elimination Preconditioned Inexact Newton Method for Heterogeneous Hyperelasticity. SIAM Journal of Scientific Computing, 2019, 41, S390-S408.	1.3	9
65	Parallel overlapping domain decomposition methods for coupled inverse elliptic problems. Communications in Applied Mathematics and Computational Science, 2009, 4, 1-26.	0.7	8
66	Parallel fully implicit two–grid methods for distributed control of unsteady incompressible flows. International Journal for Numerical Methods in Fluids, 2013, 72, 1-21.	0.9	8
67	A Multilayer Nonlinear Elimination Preconditioned Inexact Newton Method for Steady-State Incompressible Flow Problems in Three Dimensions. SIAM Journal of Scientific Computing, 2020, 42, B1404-B1428.	1.3	8
68	Numerical Simulation of Blood Flows in Patient-specific Abdominal Aorta with Primary Organs. Biomechanics and Modeling in Mechanobiology, 2021, 20, 909-924.	1.4	8
69	Some observations on thel2 convergence of the additive Schwarz preconditioned GMRES method. Numerical Linear Algebra With Applications, 2002, 9, 379-397.	0.9	7
70	Parallel Two-Grid Semismooth Newton-Krylov-Schwarz Method for Nonlinear Complementarity Problems. Journal of Scientific Computing, 2011, 47, 258-280.	1.1	7
71	A parallel implicit domain decomposition algorithm for the large eddy simulation of incompressible turbulent flows on 3D unstructured meshes. International Journal for Numerical Methods in Fluids, 2019, 89, 343-361.	0.9	7
72	Parallel two-level domain decomposition based Jacobi–Davidson algorithms for pyramidal quantum dot simulation. Computer Physics Communications, 2016, 204, 74-81.	3.0	6

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73	Parallel finite-volume discrete Boltzmann method for inviscid compressible flows on unstructured grids. Physical Review E, 2021, 103, 023306.	0.8	6
74	Improving Robustness and Parallel Scalability of Newton Method Through Nonlinear Preconditioning. , 2005, , 201-208.		6
75	A parallel well-balanced finite volume method for shallow water equations with topography on the cubed-sphere. Journal of Computational and Applied Mathematics, 2011, 235, 5357-5366.	1.1	5
76	A highly parallel simulation of patientâ€specific hepatic flows. International Journal for Numerical Methods in Biomedical Engineering, 2021, 37, e3451.	1.0	5
77	A parallel domain decomposition algorithm for large scale image denoising. Inverse Problems and Imaging, 2019, 13, 1259-1282.	0.6	5
78	An element agglomeration nonlinear additive Schwarz preconditioned Newton method for unstructured finite element problems. Applications of Mathematics, 2005, 50, 247-275.	0.9	4
79	A parallel fully coupled implicit domain decomposition method for numerical simulation of microfluidic mixing in 3D. International Journal of Computer Mathematics, 2013, 90, 615-629.	1.0	4
80	A parallel twoâ€level domain decomposition based oneâ€shot method for shape optimization problems. International Journal for Numerical Methods in Engineering, 2014, 99, 945-965.	1.5	4
81	Parallel domain decomposition method for finite element approximation of 3D steady state nonâ€Newtonian fluids. International Journal for Numerical Methods in Fluids, 2015, 78, 502-520.	0.9	4
82	A highly parallel implicit domain decomposition method for the simulation of the left ventricle on unstructured meshes. Computational Mechanics, 2020, 66, 1461-1475.	2.2	4
83	Summation pollution of principal component analysis and an improved algorithm for location sensitive data. Numerical Linear Algebra With Applications, 2021, 28, e2370.	0.9	4
84	Large eddy simulation of the wind flow in a realistic full-scale urban community with a scalable parallel algorithm. Computer Physics Communications, 2022, 270, 108170.	3.0	4
85	A parallel domain decomposition method for large eddy simulation of blood flow in human artery with resistive boundary condition. Computers and Fluids, 2022, 232, 105201.	1.3	4
86	A recycling preconditioning method with auxiliary tip subspace for elastic crack propagation simulation using XFEM. Journal of Computational Physics, 2022, 452, 110910.	1.9	4
87	A central-line coarse preconditioner for Stokes flows in artery-like domains. Numerical Algorithms, 2021, 87, 137-160.	1.1	3
88	A parallel multilevel domain decomposition method for source identification problems governed by elliptic equations. Journal of Computational and Applied Mathematics, 2021, 392, 113441.	1.1	3
89	Evaluation of cerebrovascular hemodynamics in vascular dementia patients with a new individual computational fluid dynamics algorithm. Computer Methods and Programs in Biomedicine, 2022, 213, 106497.	2.6	3
90	Simulation of branching blood flows on parallel computers. Biomedical Sciences Instrumentation, 2004, 40, 325-30.	0.2	3

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91	An efficient two-level overlapping domain decomposition method for recovering unsteady sources of 3D parabolic problems. Computers and Mathematics With Applications, 2022, 111, 98-108.	1.4	3
92	Scalable Parallel Algorithms for Boundary Control of Thermally Convective Flows. , 2012, , .		2
93	A Hybrid Implementation of Two-Level Domain Decomposition Algorithm for Solving Elliptic Equation on CPU/GPUs. , 2012, , .		2
94	Mixed order discretization based two-level Schwarz preconditioners for a tracer transport problem on the cubed-sphere. Computers and Fluids, 2015, 110, 88-95.	1.3	2
95	Algorithm development for extreme-scale computing. National Science Review, 2016, 3, 26-27.	4.6	2
96	A Parallel Finite Element Method for 3D Two-Phase Moving Contact Line Problems in Complex Domains. Journal of Scientific Computing, 2017, 72, 1119-1145.	1.1	2
97	Highly parallel space-time domain decomposition methods for parabolic problems. CCF Transactions on High Performance Computing, 2019, 1, 25-34.	1.1	2
98	NKS Method for the Implicit Solution of a Coupled Allen-Cahn/Cahn-Hilliard System. Lecture Notes in Computational Science and Engineering, 2014, , 819-827.	0.1	2
99	A Nonlinear Elimination Preconditioned Inexact Newton Algorithm. SIAM Journal of Scientific Computing, 2022, 44, A1579-A1605.	1.3	2
100	Domain Decomposition Methods for PDE Constrained Optimization Problems. Lecture Notes in Computer Science, 2005, , 569-582.	1.0	1
101	A Parallel Domain Decomposition Algorithm for Simulating Blood Flow with Incompressible Navier-Stokes Equations with Resistive Boundary Condition. Communications in Computational Physics, 2012, 11, 1279-1299.	0.7	1
102	A Scalable Implicit Solver for Phase Field Crystal Simulations. , 2013, , .		1
103	A Fully Implicit Domain Decomposition Algorithm for Discrete-velocity BGK Equation. Procedia Engineering, 2013, 61, 404.	1.2	1
104	A Scalable Numerical Method for Simulating Flows Around High-Speed Train Under Crosswind Conditions. Communications in Computational Physics, 2014, 15, 944-958.	0.7	1
105	Numerical aerodynamic simulation of transient flows around car based on parallel Newtonâ€"Krylovâ€"Schwarz algorithm. Applicable Analysis, 2021, 100, 1501-1513.	0.6	1
106	A Combined Linear and Nonlinear Preconditioning Technique for Incompressible Navier-Stokes Equations. Lecture Notes in Computer Science, 2006, , 313-322.	1.0	1
107	Nonlinear Overlapping Domain Decomposition Methods. Lecture Notes in Computational Science and Engineering, 2009, , 217-224.	0.1	1
108	One-Shot Domain Decomposition Methods for Shape Optimization Problems. Lecture Notes in Computational Science and Engineering, 2013, , 535-542.	0.1	1

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109	Point-block incomplete LU preconditioning with asynchronous iterations on GPU for multiphysics problems. International Journal of High Performance Computing Applications, 2021, 35, 121-135.	2.4	1
110	High-resolution cerebral blood flow simulation with a domain decomposition method and verified by the TCD measurement. Computer Methods and Programs in Biomedicine, 2022, 224, 107004.	2.6	1
111	A Domain Decomposition Based Parallel Inexact Newton's Method with Subspace Correction for Incompressible Navier-Stokes Equations. Lecture Notes in Computer Science, 2009, , 795-803.	1.0	0
112	Special Section: 2010 Copper Mountain Conference. SIAM Journal of Scientific Computing, 2011, 33, 2685-2685.	1.3	0
113	Numerical Design of an Optimal Bypass for a Partially Blocked Artery. , 2012, , .		0
114	A Fully Implicit Domain Decomposition Method for Transport Problems on the Cubed-sphere. Procedia Engineering, 2013, 61, 403.	1.2	0
115	Simulating 3D Flows Passing Wind Turbine Rotors with a Domain Decomposition Method on a Moving Domain. Procedia Engineering, 2013, 61, 405.	1.2	0
116	A Parallel Adaptive Nonlinear Elimination Preconditioned Inexact Newton for Transonic Full Potential Flow Problems. Procedia Engineering, 2013, 61, 402.	1.2	0
117	Simulation of Blood Flow in Patient-specific Cerebral Arteries with a Domain Decomposition Method. Lecture Notes in Computational Science and Engineering, 2017, , 407-415.	0.1	0
118	Parallel Numerical Simulation of Blood Flows in Patient-specific Aortic Dissection. , 2021, , .		0
119	Simulating Flows Passing a Wind Turbine with a Fully Implicit Domain Decomposition Method. Lecture Notes in Computational Science and Engineering, 2016, , 453-460.	0.1	0