

# Xiao-Chuan Cai

## List of Publications by Year in descending order

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119  
papers

2,942  
citations

201674

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124  
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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.	2.8	443
2	Nonlinearly Preconditioned Inexact Newton Algorithms. SIAM Journal of Scientific Computing, 2002, 24, 183-200.	2.8	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.	1.9	149
5	Parallel Newton–Krylov–Schwarz Algorithms for the Transonic Full Potential Equation. SIAM Journal of Scientific Computing, 1998, 19, 246-265.	2.8	112
6	Multiplicative Schwarz Methods for Parabolic Problems. SIAM Journal of Scientific Computing, 1994, 15, 587-603.	2.8	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.	3.8	99
8	Multiplicative Schwarz Algorithms for Some Nonsymmetric and Indefinite Problems. SIAM Journal on Numerical Analysis, 1993, 30, 936-952.	2.3	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.	1.6	76
10	A parallel nonlinear additive Schwarz preconditioned inexact Newton algorithm for incompressible Navier–Stokes equations. Journal of Computational Physics, 2005, 204, 666-691.	3.8	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.	3.8	64
12	Non-linear additive Schwarz preconditioners and application in computational fluid dynamics. International Journal for Numerical Methods in Fluids, 2002, 40, 1463-1470.	1.6	55
13	Restricted Additive Schwarz Preconditioners with Harmonic Overlap for Symmetric Positive Definite Linear Systems. SIAM Journal on Numerical Analysis, 2003, 41, 1209-1231.	2.3	52
14	A preconditioned GMRES method for nonsymmetric or indefinite problems. Mathematics of Computation, 1992, 59, 311-311.	2.1	47
15	Overlapping Domain Decomposition Algorithms for General Sparse Matrices. Numerical Linear Algebra With Applications, 1996, 3, 221-237.	1.6	45
16	Overlapping Nonmatching Grid Mortar Element Methods for Elliptic Problems. SIAM Journal on Numerical Analysis, 1999, 36, 581-606.	2.3	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.	2.8	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.	4.3	42

#	ARTICLE	IF	CITATIONS
19	A class of parallel two-level nonlinear Schwarz preconditioned inexact Newton algorithms. <i>Computer Methods in Applied Mechanics and Engineering</i> , 2007, 196, 1603-1611.	6.6	39
20	A Fully Implicit Domain Decomposition Algorithm for Shallow Water Equations on the Cubed-Sphere. <i>SIAM Journal of Scientific Computing</i> , 2010, 32, 418-438.	2.8	37
21	A Scalable Fully Implicit Compressible Euler Solver for Mesoscale Nonhydrostatic Simulation of Atmospheric Flows. <i>SIAM Journal of Scientific Computing</i> , 2014, 36, S23-S47.	2.8	36
22	Inexact Newton Methods with Restricted Additive Schwarz Based Nonlinear Elimination for Problems with High Local Nonlinearity. <i>SIAM Journal of Scientific Computing</i> , 2011, 33, 746-762.	2.8	35
23	A Highly Scalable Multilevel Schwarz Method with Boundary Geometry Preserving Coarse Spaces for 3D Elasticity Problems on Domains with Complex Geometry. <i>SIAM Journal of Scientific Computing</i> , 2016, 38, C73-C95.	2.8	35
24	A comparison of some domain decomposition and ILU preconditioned iterative methods for nonsymmetric elliptic problems. <i>Numerical Linear Algebra With Applications</i> , 1994, 1, 477-504.	1.6	31
25	Parallel multilevel methods for implicit solution of shallow water equations with nonsmooth topography on the cubed-sphere. <i>Journal of Computational Physics</i> , 2011, 230, 2523-2539.	3.8	30
26	A scalable nonlinear fluid-structure interaction solver based on a Schwarz preconditioner with isogeometric unstructured coarse spaces in 3D. <i>Journal of Computational Physics</i> , 2017, 340, 498-518.	3.8	29
27	$H^1$ Norm Error Bounds for Piecewise Hermite Bicubic Orthogonal Spline Collocation Schemes for Elliptic Boundary Value Problems. <i>SIAM Journal on Numerical Analysis</i> , 1994, 31, 1128-1146.	2.3	27
28	Two-Level Newton and Hybrid Schwarz Preconditioners for Fluid-Structure Interaction. <i>SIAM Journal of Scientific Computing</i> , 2010, 32, 2395-2417.	2.8	27
29	Nonlinear Preconditioning Techniques for Full-Space Lagrange-Newton Solution of PDE-Constrained Optimization Problems. <i>SIAM Journal of Scientific Computing</i> , 2016, 38, A2756-A2778.	2.8	27
30	The Use of Pointwise Interpolation in Domain Decomposition Methods with Nonnested Meshes. <i>SIAM Journal of Scientific Computing</i> , 1995, 16, 250-256.	2.8	24
31	An efficient finite element method for simulation of droplet spreading on a topologically rough surface. <i>Journal of Computational Physics</i> , 2017, 349, 233-252.	3.8	23
32	Numerical solution for consolidation and desiccation of soft soils. <i>International Journal for Numerical and Analytical Methods in Geomechanics</i> , 2002, 26, 139-161.	3.3	22
33	Simulation of unsteady blood flows in a patient-specific compliant pulmonary artery with a highly parallel monolithically coupled fluid-structure interaction algorithm. <i>International Journal for Numerical Methods in Biomedical Engineering</i> , 2019, 35, e3208.	2.1	22
34	Additive Schwarz-based fully coupled implicit methods for resistive Hall magnetohydrodynamic problems. <i>Journal of Computational Physics</i> , 2007, 225, 1919-1936.	3.8	21
35	An efficient parallel simulation of unsteady blood flows in patient-specific pulmonary artery. <i>International Journal for Numerical Methods in Biomedical Engineering</i> , 2018, 34, e2952.	2.1	21
36	A nonlinear elimination preconditioned inexact Newton method for blood flow problems in human artery with stenosis. <i>Journal of Computational Physics</i> , 2019, 399, 108926.	3.8	21

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37	An Optimal Two-Level Overlapping Domain Decomposition Method for Elliptic Problems in Two and Three Dimensions. <i>SIAM Journal of Scientific Computing</i> , 1993, 14, 239-247.	2.8	20
38	A parallel adaptive nonlinear elimination preconditioned inexact Newton method for transonic full potential equation. <i>Computers and Fluids</i> , 2015, 110, 96-107.	2.5	20
39	Efficient parallel simulation of hemodynamics in patient-specific abdominal aorta with aneurysm. <i>Computers in Biology and Medicine</i> , 2021, 136, 104652.	7.0	20
40	Parallel Domain Decomposition Methods for Stochastic Elliptic Equations. <i>SIAM Journal of Scientific Computing</i> , 2007, 29, 2096-2114.	2.8	19
41	Two-Level Space-Time Domain Decomposition Methods for Three-Dimensional Unsteady Inverse Source Problems. <i>Journal of Scientific Computing</i> , 2016, 67, 860-882.	2.3	19
42	Parallel One-Shot Lagrange-Newton-Krylov-Schwarz Algorithms for Shape Optimization of Steady Incompressible Flows. <i>SIAM Journal of Scientific Computing</i> , 2012, 34, B584-B605.	2.8	18
43	Fully implicit Lagrange-Newton-Krylov-Schwarz algorithms for boundary control of unsteady incompressible flows. <i>International Journal for Numerical Methods in Engineering</i> , 2012, 91, 644-665.	2.8	18
44	A Fully Implicit Method for Lattice Boltzmann Equations. <i>SIAM Journal of Scientific Computing</i> , 2015, 37, S291-S313.	2.8	18
45	A Nonlinearly Preconditioned Inexact Newton Algorithm for Steady State Lattice Boltzmann Equations. <i>SIAM Journal of Scientific Computing</i> , 2016, 38, A1701-A1724.	2.8	18
46	Fully implicit hybrid two-level domain decomposition algorithms for two-phase flows in porous media on 3D unstructured grids. <i>Journal of Computational Physics</i> , 2020, 409, 109312.	3.8	18
47	Maximum Norm Analysis of Overlapping Nonmatching Grid Discretizations of Elliptic Equations. <i>SIAM Journal on Numerical Analysis</i> , 2000, 37, 1709-1728.	2.3	17
48	A parallel two-level method for simulating blood flows in branching arteries with the resistive boundary condition. <i>Computers and Fluids</i> , 2011, 45, 92-102.	2.5	17
49	Fusing 2D and 3D convolutional neural networks for the segmentation of aorta and coronary arteries from CT images. <i>Artificial Intelligence in Medicine</i> , 2021, 121, 102189.	6.5	16
50	A parallel space-time domain decomposition method for unsteady source inversion problems. <i>Inverse Problems and Imaging</i> , 2015, 9, 1069-1091.	1.1	15
51	A Parallel Domain Decomposition Method for 3D Unsteady Incompressible Flows at High Reynolds Number. <i>Journal of Scientific Computing</i> , 2014, 58, 275-289.	2.3	14
52	Overlapping Domain Decomposition Algorithms for General Sparse Matrices. <i>Numerical Linear Algebra With Applications</i> , 1996, 3, 221-237.	1.6	14
53	Scalability study of an implicit solver for coupled fluid-structure interaction problems on unstructured meshes in 3D. <i>International Journal of High Performance Computing Applications</i> , 2018, 32, 207-219.	3.7	13
54	A parallel non-nested two-level domain decomposition method for simulating blood flows in cerebral artery of stroke patient. <i>International Journal for Numerical Methods in Biomedical Engineering</i> , 2020, 36, e3392.	2.1	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.	2.3	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.	3.8	12
57	Multilevel Space-Time Additive Schwarz Methods for Parabolic Equations. SIAM Journal of Scientific Computing, 2018, 40, A3012-A3037.	2.8	12
58	Implicit Space-Time Domain Decomposition Methods for Stochastic Parabolic Partial Differential Equations. SIAM Journal of Scientific Computing, 2014, 36, C1-C24.	2.8	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.	2.8	10
60	One-level Newton-Krylov-Schwarz algorithm for unsteady non-linear radiation diffusion problem. Numerical Linear Algebra With Applications, 2004, 11, 867-881.	1.6	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.	2.3	9
63	Two-Level Space-Time Domain Decomposition Methods for Flow Control Problems. Journal of Scientific Computing, 2017, 70, 717-743.	2.3	9
64	A Nonlinear Elimination Preconditioned Inexact Newton Method for Heterogeneous Hyperelasticity. SIAM Journal of Scientific Computing, 2019, 41, S390-S408.	2.8	9
65	Parallel overlapping domain decomposition methods for coupled inverse elliptic problems. Communications in Applied Mathematics and Computational Science, 2009, 4, 1-26.	1.8	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.	1.6	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.	2.8	8
68	Numerical Simulation of Blood Flows in Patient-specific Abdominal Aorta with Primary Organs. Biomechanics and Modeling in Mechanobiology, 2021, 20, 909-924.	2.8	8
69	Some observations on the $l_2$ convergence of the additive Schwarz preconditioned GMRES method. Numerical Linear Algebra With Applications, 2002, 9, 379-397.	1.6	7
70	Parallel Two-Grid Semismooth Newton-Krylov-Schwarz Method for Nonlinear Complementarity Problems. Journal of Scientific Computing, 2011, 47, 258-280.	2.3	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.	1.6	7
72	Parallel two-level domain decomposition based Jacobi-Davidson algorithms for pyramidal quantum dot simulation. Computer Physics Communications, 2016, 204, 74-81.	7.5	6

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73	Parallel finite-volume discrete Boltzmann method for inviscid compressible flows on unstructured grids. <i>Physical Review E</i> , 2021, 103, 023306.	2.1	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. <i>Journal of Computational and Applied Mathematics</i> , 2011, 235, 5357-5366.	2.0	5
76	A highly parallel simulation of patient-specific hepatic flows. <i>International Journal for Numerical Methods in Biomedical Engineering</i> , 2021, 37, e3451.	2.1	5
77	A parallel domain decomposition algorithm for large scale image denoising. <i>Inverse Problems and Imaging</i> , 2019, 13, 1259-1282.	1.1	5
78	An element agglomeration nonlinear additive Schwarz preconditioned Newton method for unstructured finite element problems. <i>Applications of Mathematics</i> , 2005, 50, 247-275.	0.9	4
79	A parallel fully coupled implicit domain decomposition method for numerical simulation of microfluidic mixing in 3D. <i>International Journal of Computer Mathematics</i> , 2013, 90, 615-629.	1.8	4
80	A parallel two-level domain decomposition based one-shot method for shape optimization problems. <i>International Journal for Numerical Methods in Engineering</i> , 2014, 99, 945-965.	2.8	4
81	Parallel domain decomposition method for finite element approximation of 3D steady state non-Newtonian fluids. <i>International Journal for Numerical Methods in Fluids</i> , 2015, 78, 502-520.	1.6	4
82	A highly parallel implicit domain decomposition method for the simulation of the left ventricle on unstructured meshes. <i>Computational Mechanics</i> , 2020, 66, 1461-1475.	4.0	4
83	Summation pollution of principal component analysis and an improved algorithm for location sensitive data. <i>Numerical Linear Algebra With Applications</i> , 2021, 28, e2370.	1.6	4
84	Large eddy simulation of the wind flow in a realistic full-scale urban community with a scalable parallel algorithm. <i>Computer Physics Communications</i> , 2022, 270, 108170.	7.5	4
85	A parallel domain decomposition method for large eddy simulation of blood flow in human artery with resistive boundary condition. <i>Computers and Fluids</i> , 2022, 232, 105201.	2.5	4
86	A recycling preconditioning method with auxiliary tip subspace for elastic crack propagation simulation using XFEM. <i>Journal of Computational Physics</i> , 2022, 452, 110910.	3.8	4
87	A central-line coarse preconditioner for Stokes flows in artery-like domains. <i>Numerical Algorithms</i> , 2021, 87, 137-160.	1.9	3
88	A parallel multilevel domain decomposition method for source identification problems governed by elliptic equations. <i>Journal of Computational and Applied Mathematics</i> , 2021, 392, 113441.	2.0	3
89	Evaluation of cerebrovascular hemodynamics in vascular dementia patients with a new individual computational fluid dynamics algorithm. <i>Computer Methods and Programs in Biomedicine</i> , 2022, 213, 106497.	4.7	3
90	Simulation of branching blood flows on parallel computers. <i>Biomedical Sciences Instrumentation</i> , 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. <i>Computers and Mathematics With Applications</i> , 2022, 111, 98-108.	2.7	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. <i>Computers and Fluids</i> , 2015, 110, 88-95.	2.5	2
95	Algorithm development for extreme-scale computing. <i>National Science Review</i> , 2016, 3, 26-27.	9.5	2
96	A Parallel Finite Element Method for 3D Two-Phase Moving Contact Line Problems in Complex Domains. <i>Journal of Scientific Computing</i> , 2017, 72, 1119-1145.	2.3	2
97	Highly parallel space-time domain decomposition methods for parabolic problems. <i>CCF Transactions on High Performance Computing</i> , 2019, 1, 25-34.	1.7	2
98	NKS Method for the Implicit Solution of a Coupled Allen-Cahn/Cahn-Hilliard System. <i>Lecture Notes in Computational Science and Engineering</i> , 2014, , 819-827.	0.3	2
99	A Nonlinear Elimination Preconditioned Inexact Newton Algorithm. <i>SIAM Journal of Scientific Computing</i> , 2022, 44, A1579-A1605.	2.8	2
100	Domain Decomposition Methods for PDE Constrained Optimization Problems. <i>Lecture Notes in Computer Science</i> , 2005, , 569-582.	1.3	1
101	A Parallel Domain Decomposition Algorithm for Simulating Blood Flow with Incompressible Navier-Stokes Equations with Resistive Boundary Condition. <i>Communications in Computational Physics</i> , 2012, 11, 1279-1299.	1.7	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. <i>Procedia Engineering</i> , 2013, 61, 404.	1.2	1
104	A Scalable Numerical Method for Simulating Flows Around High-Speed Train Under Crosswind Conditions. <i>Communications in Computational Physics</i> , 2014, 15, 944-958.	1.7	1
105	Numerical aerodynamic simulation of transient flows around car based on parallel Newton-Krylov-Schwarz algorithm. <i>Applicable Analysis</i> , 2021, 100, 1501-1513.	1.3	1
106	A Combined Linear and Nonlinear Preconditioning Technique for Incompressible Navier-Stokes Equations. <i>Lecture Notes in Computer Science</i> , 2006, , 313-322.	1.3	1
107	Nonlinear Overlapping Domain Decomposition Methods. <i>Lecture Notes in Computational Science and Engineering</i> , 2009, , 217-224.	0.3	1
108	One-Shot Domain Decomposition Methods for Shape Optimization Problems. <i>Lecture Notes in Computational Science and Engineering</i> , 2013, , 535-542.	0.3	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.	3.7	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.	4.7	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.	1.3	0
112	Special Section: 2010 Copper Mountain Conference. SIAM Journal of Scientific Computing, 2011, 33, 2685-2685.	2.8	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.	0.3	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.	0.3	0