

Omar Ghattas

List of Publications by Year in descending order

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73
papers

4,679
citations

159358

30
h-index

123241

61
g-index

76
all docs

76
docs citations

76
times ranked

2791
citing authors

#	ARTICLE	IF	CITATIONS
1	Scalable Algorithms for Parallel Adaptive Mesh Refinement on Forests of Octrees. SIAM Journal of Scientific Computing, 2011, 33, 1103-1133.	1.3	491
2	The Dynamics of Plate Tectonics and Mantle Flow: From Local to Global Scales. Science, 2010, 329, 1033-1038.	6.0	284
3	A Stochastic Newton MCMC Method for Large-Scale Statistical Inverse Problems with Application to Seismic Inversion. SIAM Journal of Scientific Computing, 2012, 34, A1460-A1487.	1.3	281
4	Large-scale simulation of elastic wave propagation in heterogeneous media on parallel computers. Computer Methods in Applied Mechanics and Engineering, 1998, 152, 85-102.	3.4	257
5	A Computational Framework for Infinite-Dimensional Bayesian Inverse Problems Part I: The Linearized Case, with Application to Global Seismic Inversion. SIAM Journal of Scientific Computing, 2013, 35, A2494-A2523.	1.3	245
6	Parallel Lagrange-Newton-Krylov-Schur Methods for PDE-Constrained Optimization. Part I: The Krylov-Schur Solver. SIAM Journal of Scientific Computing, 2005, 27, 687-713.	1.3	195
7	A high-order discontinuous Galerkin method for wave propagation through coupled elastic-acoustic media. Journal of Computational Physics, 2010, 229, 9373-9396.	1.9	195
8	Parameter and State Model Reduction for Large-Scale Statistical Inverse Problems. SIAM Journal of Scientific Computing, 2010, 32, 2523-2542.	1.3	168
9	A Computational Framework for Infinite-Dimensional Bayesian Inverse Problems, Part II: Stochastic Newton MCMC with Application to Ice Sheet Flow Inverse Problems. SIAM Journal of Scientific Computing, 2014, 36, A1525-A1555.	1.3	145
10	High Resolution Forward And Inverse Earthquake Modeling on Terascale Computers. , 2003, , .		121
11	Parallel Lagrange-Newton-Krylov-Schur Methods for PDE-Constrained Optimization. Part II: The Lagrange-Newton Solver and Its Application to Optimal Control of Steady Viscous Flows. SIAM Journal of Scientific Computing, 2005, 27, 714-739.	1.3	109
12	Scalable and efficient algorithms for the propagation of uncertainty from data through inference to prediction for large-scale problems, with application to flow of the Antarctic ice sheet. Journal of Computational Physics, 2015, 296, 348-368.	1.9	100
13	An extreme-scale implicit solver for complex PDEs. , 2015, , .		96
14	Parallel scalable adjoint-based adaptive solution of variable-viscosity Stokes flow problems. Computer Methods in Applied Mechanics and Engineering, 2009, 198, 1691-1700.	3.4	94
15	A-Optimal Design of Experiments for Infinite-Dimensional Bayesian Linear Inverse Problems with Regularized ℓ_0 -Sparsification. SIAM Journal of Scientific Computing, 2014, 36, A2122-A2148.	1.3	85
16	A Fast and Scalable Method for A-Optimal Design of Experiments for Infinite-dimensional Bayesian Nonlinear Inverse Problems. SIAM Journal of Scientific Computing, 2016, 38, A243-A272.	1.3	85
17	A Bayesian approach to estimate uncertainty for full-waveform inversion using a priori information from depth migration. Geophysics, 2016, 81, R307-R323.	1.4	82
18	Optimal Control of Two- and Three-Dimensional Incompressible Navier-Stokes Flows. Journal of Computational Physics, 1997, 136, 231-244.	1.9	81

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19	An inexact Gauss-Newton method for inversion of basal sliding and rheology parameters in a nonlinear Stokes ice sheet model. <i>Journal of Glaciology</i> , 2012, 58, 889-903.	1.1	80
20	From Mesh Generation to Scientific Visualization: An End-to-End Approach to Parallel Supercomputing. , 2006, , .		79
21	Multi-scale dynamics and rheology of mantle flow with plates. <i>Journal of Geophysical Research</i> , 2012, 117, .	3.3	65
22	Recursive Algorithms for Distributed Forests of Octrees. <i>SIAM Journal of Scientific Computing</i> , 2015, 37, C497-C531.	1.3	61
23	Learning physics-based models from data: perspectives from inverse problems and model reduction. <i>Acta Numerica</i> , 2021, 30, 445-554.	6.3	61
24	Extreme-Scale AMR. , 2010, , .		58
25	Scalable systems software—From mesh generation to scientific visualization. , 2006, , .		55
26	Large-scale adaptive mantle convection simulation. <i>Geophysical Journal International</i> , 2013, 192, 889-906.	1.0	54
27	Algorithmic strategies for full waveform inversion: 1D experiments. <i>Geophysics</i> , 2009, 74, WCC37-WCC46.	1.4	50
28	The imperative of physics-based modeling and inverse theory in computational science. <i>Nature Computational Science</i> , 2021, 1, 166-168.	3.8	50
29	Mean-Variance Risk-Averse Optimal Control of Systems Governed by PDEs with Random Parameter Fields Using Quadratic Approximations. <i>SIAM-ASA Journal on Uncertainty Quantification</i> , 2017, 5, 1166-1192.	1.1	49
30	On Bayesian A- and D-Optimal Experimental Designs in Infinite Dimensions. <i>Bayesian Analysis</i> , 2016, 11, .	1.6	44
31	hIPPYlib. <i>ACM Transactions on Mathematical Software</i> , 2021, 47, 1-34.	1.6	40
32	Extreme-scale UQ for Bayesian inverse problems governed by PDEs. , 2012, , .		39
33	Three-dimensional nonlinear seismic ground motion modeling in basins. <i>Physics of the Earth and Planetary Interiors</i> , 2003, 137, 81-95.	0.7	38
34	hIPPYlib: An Extensible Software Framework for Large-Scale Inverse Problems. <i>Journal of Open Source Software</i> , 2018, 3, 940.	2.0	37
35	Optimal design of acoustic metamaterial cloaks under uncertainty. <i>Journal of Computational Physics</i> , 2021, 431, 110114.	1.9	34
36	Parallel geometric-algebraic multigrid on unstructured forests of octrees. , 2012, , .		33

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37	Analysis of the Hessian for inverse scattering problems: I. Inverse shape scattering of acoustic waves. <i>Inverse Problems</i> , 2012, 28, 055001.	1.0	32
38	Towards adjoint-based inversion for rheological parameters in nonlinear viscous mantle flow. <i>Physics of the Earth and Planetary Interiors</i> , 2014, 234, 23-34.	0.7	32
39	Solution of Nonlinear Stokes Equations Discretized By High-Order Finite Elements on Nonconforming and Anisotropic Meshes, with Application to Ice Sheet Dynamics. <i>SIAM Journal of Scientific Computing</i> , 2015, 37, B804-B833.	1.3	32
40	Slab stress and strain rate as constraints on global mantle flow. <i>Geophysical Research Letters</i> , 2010, 37, .	1.5	31
41	Hessian-based adaptive sparse quadrature for infinite-dimensional Bayesian inverse problems. <i>Computer Methods in Applied Mechanics and Engineering</i> , 2017, 327, 147-172.	3.4	29
42	Taylor approximation and variance reduction for PDE-constrained optimal control under uncertainty. <i>Journal of Computational Physics</i> , 2019, 385, 163-186.	1.9	29
43	A Randomized Maximum A Posteriori Method for Posterior Sampling of High Dimensional Nonlinear Bayesian Inverse Problems. <i>SIAM Journal of Scientific Computing</i> , 2018, 40, A142-A171.	1.3	28
44	Visualizing Very Large-Scale Earthquake Simulations. , 2003, , .		26
45	Low-Cost Parallel Algorithms for 2:1 Octree Balance. , 2012, , .		25
46	Analysis of an \mathcal{H}^p -Nonconforming Discontinuous Galerkin Spectral Element Method for Wave Propagation. <i>SIAM Journal on Numerical Analysis</i> , 2012, 50, 1801-1826.	1.1	25
47	Analysis of the Hessian for inverse scattering problems: II. Inverse medium scattering of acoustic waves. <i>Inverse Problems</i> , 2012, 28, 055002.	1.0	24
48	Discretely Exact Derivatives for Hyperbolic PDE-Constrained Optimization Problems Discretized by the Discontinuous Galerkin Method. <i>Journal of Scientific Computing</i> , 2015, 63, 138-162.	1.1	22
49	Derivative-informed projected neural networks for high-dimensional parametric maps governed by PDEs. <i>Computer Methods in Applied Mechanics and Engineering</i> , 2022, 388, 114199.	3.4	22
50	Weighted BFBT Preconditioner for Stokes Flow Problems with Highly Heterogeneous Viscosity. <i>SIAM Journal of Scientific Computing</i> , 2017, 39, S272-S297.	1.3	21
51	Analysis of the Hessian for inverse scattering problems. Part III: Inverse medium scattering of electromagnetic waves in three dimensions. <i>Inverse Problems and Imaging</i> , 2013, 7, 1139-1155.	0.6	20
52	Bayesian Poroelastic Aquifer Characterization From InSAR Surface Deformation Data. Part I: Maximum A Posteriori Estimate. <i>Water Resources Research</i> , 2020, 56, e2020WR027391.	1.7	19
53	Adaptive Hessian-Based Nonstationary Gaussian Process Response Surface Method for Probability Density Approximation with Application to Bayesian Solution of Large-Scale Inverse Problems. <i>SIAM Journal of Scientific Computing</i> , 2012, 34, A2837-A2871.	1.3	18
54	A-optimal encoding weights for nonlinear inverse problems, with application to the Helmholtz inverse problem. <i>Inverse Problems</i> , 2017, 33, 074008.	1.0	18

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55	Bayesian inference of heterogeneous epidemic models: Application to COVID-19 spread accounting for long-term care facilities. <i>Computer Methods in Applied Mechanics and Engineering</i> , 2021, 385, 114020.	3.4	13
56	<i>ALPS</i> : A framework for parallel adaptive PDE solution. <i>Journal of Physics: Conference Series</i> , 2009, 180, 012009.	0.3	10
57	Tensor Train Construction From Tensor Actions, With Application to Compression of Large High Order Derivative Tensors. <i>SIAM Journal of Scientific Computing</i> , 2020, 42, A3516-A3539.	1.3	10
58	Taylor Approximation for Chance Constrained Optimization Problems Governed by Partial Differential Equations with High-Dimensional Random Parameters. <i>SIAM-ASA Journal on Uncertainty Quantification</i> , 2021, 9, 1381-1410.	1.1	10
59	Hierarchical Matrix Approximations of Hessians Arising in Inverse Problems Governed by PDEs. <i>SIAM Journal of Scientific Computing</i> , 2020, 42, A3397-A3426.	1.3	9
60	A Nested Partitioning Algorithm for Adaptive Meshes on Heterogeneous Clusters. , 2015, , .		8
61	Inversion of geothermal heat flux in a thermomechanically coupled nonlinear Stokes ice sheet model. <i>Cryosphere</i> , 2016, 10, 1477-1494.	1.5	8
62	Stein Variational Reduced Basis Bayesian Inversion. <i>SIAM Journal of Scientific Computing</i> , 2021, 43, A1163-A1193.	1.3	8
63	Bayesian Poroelastic Aquifer Characterization From InSAR Surface Deformation Data. 2. Quantifying the Uncertainty. <i>Water Resources Research</i> , 2021, 57, e2021WR029775.	1.7	8
64	Parameter sensitivity analysis of a nonlinear least-squares optimization-based anelastic full waveform inversion method. <i>Comptes Rendus - Mecanique</i> , 2010, 338, 364-376.	2.1	6
65	Scalable Matrix-Free Adaptive Product-Convolution Approximation for Locally Translation-Invariant Operators. <i>SIAM Journal of Scientific Computing</i> , 2019, 41, A2296-A2328.	1.3	6
66	A Globally Convergent Modified Newton Method for the Direct Minimization of the Ohta-Kawasaki Energy with Application to the Directed Self-Assembly of Diblock Copolymers. <i>SIAM Journal of Scientific Computing</i> , 2022, 44, B51-B79.	1.3	6
67	A Data Scalable Augmented Lagrangian KKT Preconditioner for Large-Scale Inverse Problems. <i>SIAM Journal of Scientific Computing</i> , 2017, 39, A2365-A2393.	1.3	5
68	A Framework for Online Inversion-Based 3D Site Characterization. <i>Lecture Notes in Computer Science</i> , 2004, , 717-724.	1.0	5
69	Nonuniform 3D finite-difference elastic wave simulation on staggered grids. <i>Geophysics</i> , 2022, 87, T347-T361.	1.4	3
70	Taylor approximation for PDE-constrained optimization under uncertainty: Application to turbulent jet flow. <i>Proceedings in Applied Mathematics and Mechanics</i> , 2018, 18, e201800466.	0.2	2
71	Algorithmic strategies for full-waveform Inversion: 1D Experiments. , 2007, , .		0
72	Uncertainty estimation for full waveform inversion with a prior information from depth migration. , 2015, , .		0

#	ARTICLE	IF	CITATIONS
73	Scalable Algorithms for Bayesian Inference of Large-Scale Models from Large-Scale Data. Lecture Notes in Computer Science, 2017, , 3-6.	1.0	0