Omar Ghattas

List of Publications by Year
in descending order

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	Derivative-informed projected neural networks for high-dimensional parametric maps governed by PDEs. Computer Methods in Applied Mechanics and Engineering, 2022, 388, 114199.	3.4	22
2	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. SIAM Journal of Scientific Computing, 2022, 44, B51-B79.	1.3	6
3	Nonuniform 3D finite-difference elastic wave simulation on staggered grids. Geophysics, 2022, 87, T347-T361.	1.4	3
4	Stein Variational Reduced Basis Bayesian Inversion. SIAM Journal of Scientific Computing, 2021, 43, A1163-A1193.	1.3	8
5	The imperative of physics-based modeling and inverse theory in computational science. Nature Computational Science, 2021, 1, 166-168.	3.8	50
6	Optimal design of acoustic metamaterial cloaks under uncertainty. Journal of Computational Physics, 2021, 431, 110114.	1.9	34
7	hIPPYlib. ACM Transactions on Mathematical Software, 2021, 47, 1-34.	1.6	40
8	Learning physics-based models from data: perspectives from inverse problems and model reduction. Acta Numerica, 2021, 30, 445-554.	6.3	61
9	Bayesian Poroelastic Aquifer Characterization From InSAR Surface Deformation Data. 2. Quantifying the Uncertainty. Water Resources Research, 2021, 57, e2021WR029775.	1.7	8
10	Bayesian inference of heterogeneous epidemic models: Application to COVID-19 spread accounting for long-term care facilities. Computer Methods in Applied Mechanics and Engineering, 2021, 385, 114020.	3.4	13
11	Taylor Approximation for Chance Constrained Optimization Problems Governed by Partial Differential Equations with High-Dimensional Random Parameters. SIAM-ASA Journal on Uncertainty Quantification, 2021, 9, 1381-1410.	1.1	10
12	Bayesian Poroelastic Aquifer Characterization From InSAR Surface Deformation Data. Part I: Maximum A Posteriori Estimate. Water Resources Research, 2020, 56, e2020WR027391.	1.7	19
13	Hierarchical Matrix Approximations of Hessians Arising in Inverse Problems Governed by PDEs. SIAM Journal of Scientific Computing, 2020, 42, A3397-A3426.	1.3	9
14	Tensor Train Construction From Tensor Actions, With Application to Compression of Large High Order Derivative Tensors. SIAM Journal of Scientific Computing, 2020, 42, A3516-A3539.	1.3	10
15	Taylor approximation and variance reduction for PDE-constrained optimal control under uncertainty. Journal of Computational Physics, 2019, 385, 163-186.	1.9	29
16	Scalable Matrix-Free Adaptive Product-Convolution Approximation for Locally Translation-Invariant Operators. SIAM Journal of Scientific Computing, 2019, 41, A2296-A2328.	1.3	6
17	A Randomized Maximum A Posteriori Method for Posterior Sampling of High Dimensional Nonlinear Bayesian Inverse Problems. SIAM Journal of Scientific Computing, 2018, 40, A142-A171.	1.3	28
18	Taylor approximation for PDE‐constrained optimization under uncertainty: Application to turbulent jet flow. Proceedings in Applied Mathematics and Mechanics, 2018, 18, e201800466.	0.2	2

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19	hIPPYlib: An Extensible Software Framework for Large-Scale Inverse Problems. Journal of Open Source Software, 2018, 3, 940.	2.0	37
20	A-optimal encoding weights for nonlinear inverse problems, with application to the Helmholtz inverse problem. Inverse Problems, 2017, 33, 074008.	1.0	18
21	A Data Scalable Augmented Lagrangian KKT Preconditioner for Large-Scale Inverse Problems. SIAM Journal of Scientific Computing, 2017, 39, A2365-A2393.	1.3	5
22	Hessian-based adaptive sparse quadrature for infinite-dimensional Bayesian inverse problems. Computer Methods in Applied Mechanics and Engineering, 2017, 327, 147-172.	3.4	29
23	Weighted BFBT Preconditioner for Stokes Flow Problems with Highly Heterogeneous Viscosity. SIAM Journal of Scientific Computing, 2017, 39, S272-S297.	1.3	21
24	Mean-Variance Risk-Averse Optimal Control of Systems Governed by PDEs with Random Parameter Fields Using Quadratic Approximations. SIAM-ASA Journal on Uncertainty Quantification, 2017, 5, 1166-1192.	1.1	49
25	Scalable Algorithms for Bayesian Inference ofÂLarge-Scale Models from Large-Scale Data. Lecture Notes in Computer Science, 2017, , 3-6.	1.0	0
26	Inversion of geothermal heat flux in a thermomechanically coupled nonlinear Stokes ice sheet model. Cryosphere, 2016, 10, 1477-1494.	1.5	8
27	On Bayesian A- and D-Optimal Experimental Designs in Infinite Dimensions. Bayesian Analysis, 2016, 11, .	1.6	44
28	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
29	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
30	Uncertainty estimation for full waveform inversion with a prior information from depth migration. , 2015, , .		0
31	An extreme-scale implicit solver for complex PDEs. , 2015, , .		96
32	Recursive Algorithms for Distributed Forests of Octrees. SIAM Journal of Scientific Computing, 2015, 37, C497-C531.	1.3	61
33	Solution of Nonlinear Stokes Equations Discretized By High-Order Finite Elements on Nonconforming and Anisotropic Meshes, with Application to Ice Sheet Dynamics. SIAM Journal of Scientific Computing, 2015, 37, B804-B833.	1.3	32
34	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
35	Discretely Exact Derivatives for Hyperbolic PDE-Constrained Optimization Problems Discretized by the Discontinuous Galerkin Method. Journal of Scientific Computing, 2015, 63, 138-162.	1.1	22
36	A Nested Partitioning Algorithm for Adaptive Meshes on Heterogeneous Clusters. , 2015, , .		8

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37	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
38	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
39	Towards adjoint-based inversion for rheological parameters in nonlinear viscous mantle flow. Physics of the Earth and Planetary Interiors, 2014, 234, 23-34.	0.7	32
40	Large-scale adaptive mantle convection simulation. Geophysical Journal International, 2013, 192, 889-906.	1.0	54
41	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
42	Analysis of the Hessian for inverse scattering problems. Part III: Inverse medium scattering of electromagnetic waves in three dimensions. Inverse Problems and Imaging, 2013, 7, 1139-1155.	0.6	20
43	Analysis of the Hessian for inverse scattering problems: II. Inverse medium scattering of acoustic waves. Inverse Problems, 2012, 28, 055002.	1.0	24
44	Parallel geometric-algebraic multigrid on unstructured forests of octrees. , 2012, , .		33
45	An inexact Gauss-Newton method for inversion of basal sliding and rheology parameters in a nonlinear Stokes ice sheet model. Journal of Glaciology, 2012, 58, 889-903.	1.1	80
46	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
47	Adaptive Hessian-Based Nonstationary Gaussian Process Response Surface Method for Probability Density Approximation with Application to Bayesian Solution of Large-Scale Inverse Problems. SIAM Journal of Scientific Computing, 2012, 34, A2837-A2871.	1.3	18
48	Low-Cost Parallel Algorithms for 2:1 Octree Balance. , 2012, , .		25
49	Analysis of the Hessian for inverse scattering problems: I. Inverse shape scattering of acoustic waves. Inverse Problems, 2012, 28, 055001.	1.0	32
50	Extreme-scale UQ for Bayesian inverse problems governed by PDEs. , 2012, , .		39
51	Multi‐scale dynamics and rheology of mantle flow with plates. Journal of Geophysical Research, 2012, 117, .	3.3	65
52	Analysis of an hp-Nonconforming Discontinuous Galerkin Spectral Element Method for Wave Propagation. SIAM Journal on Numerical Analysis, 2012, 50, 1801-1826.	1.1	25
53	<tt>p4est</tt>: Scalable Algorithms for Parallel Adaptive Mesh Refinement on Forests of Octrees. SIAM Journal of Scientific Computing, 2011, 33, 1103-1133.	1.3	491
54	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

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55	Parameter sensitivity analysis of a nonlinear least-squares optimization-based anelastic full waveform inversion method. Comptes Rendus - Mecanique, 2010, 338, 364-376.	2.1	6
56	Extreme-Scale AMR. , 2010, , .		58
57	Slab stress and strain rate as constraints on global mantle flow. Geophysical Research Letters, 2010, 37, .	1.5	31
58	Parameter and State Model Reduction for Large-Scale Statistical Inverse Problems. SIAM Journal of Scientific Computing, 2010, 32, 2523-2542.	1.3	168
59	The Dynamics of Plate Tectonics and Mantle Flow: From Local to Global Scales. Science, 2010, 329, 1033-1038.	6.0	284
60	Algorithmic strategies for full waveform inversion: 1D experiments. Geophysics, 2009, 74, WCC37-WCC46.	1.4	50
61	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
62	<i>ALPS:</i>A framework for parallel adaptive PDE solution. Journal of Physics: Conference Series, 2009, 180, 012009.	0.3	10
63	Algorithmic strategies for full‑waveform Inversion: 1D Experiments. , 2007, , .		0
64	Scalable systems software---From mesh generation to scientific visualization. , 2006, , .		55
65	From Mesh Generation to Scientific Visualization: An End-to-End Approach to Parallel Supercomputing. , 2006, , .		79
66	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
67	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
68	A Framework for Online Inversion-Based 3D Site Characterization. Lecture Notes in Computer Science, 2004, , 717-724.	1.0	5
69	Three-dimensional nonlinear seismic ground motion modeling in basins. Physics of the Earth and Planetary Interiors, 2003, 137, 81-95.	0.7	38
70	Visualizing Very Large-Scale Earthquake Simulations. , 2003, , .		26
71	High Resolution Forward And Inverse Earthquake Modeling on Terascale Computers. , 2003, , .		121
72	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

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73	Optimal Control of Two- and Three-Dimensional Incompressible Navier–Stokes Flows. Journal of Computational Physics, 1997, 136, 231-244.	1.9	81