Akil Narayan

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Pedagogy and courses
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University Service
Professional Service
Conference/Program Organizing Committees
Editorial service
Minisymposium/Special Sessions Organized
Referee service

Education

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PhD	Applied Mathematics	Brown University	2009	
ScM	Applied Mathematics	Brown University	2004	
BS	Engineering Sciences and Applied Mathematics	Northwestern University	2003	Summa cum laude, with honors
BS	Electrical Engineering	Northwestern University	2003	Summa cum laude, with honors

Employment

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Associate Professor	University of Utah	2019–present
Assistant Professor	University of Utah	2016–2019
Research Computer Scientist	University of Utah	2015–2016
Assistant Professor	University of Massachusetts Dartmouth	2012–2015
Visiting Assistant Professor (postdoc)	Purdue University	2009–2012

Visiting Positions

Visiting researcher	ICERM: Institute for Computational and Experimental Research in Mathematics	Spring 2020
Visiting researcher	ICERM: Institute for Computational and Experimental Research in Mathematics	Spring 2014
Visiting researcher	Shanghai Jiaotong University	Summer 2013
Visiting researcher (postdoctoral)	SAMSI: Statistical and Applied Mathematical Sciences Institute	Spring 2012
Visiting researcher	ICERM: Institute for Computational and Experimental Research in Mathematics	Fall 2012

Awards

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CAREER Award	National Science Foundation	2019
Young Investigator Program (YIP) Award	Air Force Office of Scientific Research	2015
Dean's EFS Award	UMass Dartmouth	2014
Dissertation Fellowship	Brown University	2009
IEC William L. Everitt Student Award	Northwestern University	2003

External Funding

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All metadata below, including awarded amounts, refer to the local institution unless otherwise noted. Multi-institutional metadata are indicated in the "Notes" column, when appropriate.

Title	Prime Sponsor		Role	Award + duration		Notes
Conference: NSF Computational Mathematics PI Meeting 2024	National Science Foundation	DMS-2417818	Co-PI	$99,999	2024–2024	UWash award. PI: Bamdad Hosseini
New Frontiers in Theory, Learning, and Optimization for Model Reduction	Air Force Office of Scientific Research	FA9550-23-1-0749	PI	$675,125	2023–2027	
CERTANN: Continuous wide and deep neural networks for scientific machine learning	Sandia National Laboratories	CPA 2156884	PI	$100,000	2023–2024	Subaward from Sandia LDRD. Sandia PI: John Jakeman
AI/ML: Augmented Materials and Device Exploration	Army Research Lab	W911NF2220158	Co-PI	$339,000	2022–2024	Subaward from BU. Utah PI: Robert M. Kirby
Structure-Preserving Algorithms for Hyperbolic Balance Laws with Uncertainty	National Science Foundation	DMS-2207207	Co-PI	$450,000	2022–2025	PI: Yekaterina Epshteyn
RTG: Optimization and Inversion for the 21st Century Workforce	National Science Foundation	DMS-2136198	Co-PI	$2,498,692	2022–2027	Training grant. PI: Kenneth Golden
Robust and Scalable Multi-fidelity Algorithms for Model-based Predictions	Air Force Office of Scientific Research	FA9550-20-1-0338	PI	$459,345	2020–2023	
Integration of Uncertainty Quantification with SCIRun Bioelectric Field Simulation Pipeline	National Institute of Biomedical Imaging and Bioengineering	1U24EB029012-01 5U24EB029012-02 5U24EB029012-03 3U24EB029012-03S1	Co-I	$1,055,504	2019–2022	PI: Rob MacLeod
CAREER: Optimal Approximation Algorithms in High Dimensions	National Science Foundation	DMS-1848508	PI	$400,000	2019–2024	
NURP: Stochastic inference and optimization for UUV guidance and control	Office of Naval Research	N00014-19-1-2046	PI	$56,000	2019–2021	
Computational Methods for Multivariate Orthogonal Polynomials	National Science Foundation	DMS-1720416	PI	$99,998	2017–2020	
NURP: Guidance and positioning algorithms for unmanned undersea vehicle swarms	Office of Naval Research	N00014-17-1-2590	PI	$49,837	2017–2019	
Systematic Quantification of Uncertainty And Reliability at Extreme Scales (SQUARES)	Defense Advanced Research Projects Agency	N660011524053	Co-PI	$685,000	2015–2017	PI: Dongbin Xiu
Optimal and unstructured high-order non-intrusive approximations for uncertain parameterized simulation	Air Force Office of Scientific Research	FA9550-15-1-0467	PI	$367,375	2015–2018	Young Investigator Program award
Computation of crowded geodesics on the universal Teichmueller space for planar shape matching in computer vision	National Science Foundation	DMS-1318427 DMS-1552238	PI	$325,698	2013–2017	

Publications

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88 journal articles, 14 refereed conference publications, 8 preprints

Journal Articles

Title	Authors	Journal		Year
Influence of Material Parameter Variability on the Predicted Coronary Artery Biomechanical Environment via Uncertainty Quantification	Caleb C. Berggren David Jiang Y. F. Jack Wang Jake A. Bergquist Lindsay C. Rupp Zexin Liu Rob S. MacLeod Akil Narayan Lucas H. Timmins	Biomechanics and Modeling in Mechanobiology	DOI: 10.1007/s10237-023-01814-2	2024
UncertainSCI: Uncertainty Quantification for Computational Models in Biomedicine and Bioengineering	Akil Narayan Zexin Liu Jake A. Bergquist Chantel Charlebois Sumientra Rampersad Lindsay Rupp Dana Brooks Dan White Jess Tate Rob S. MacLeod	Computers in biology and medicine	v 152, pp 106407 DOI: 10.1016/j.compbiomed.2022.10..	2023
UncertainSCI: Uncertainty Quantification for Computational Models in Biomedicine and Bioengineering	Akil Narayan Zexin Liu Jake A. Bergquist Chantel Charlebois Sumientra Rampersad Lindsay Rupp Dana Brooks Dan White Jess Tate Rob S. MacLeod	Computers in Biology and Medicine	v 152, pp 106407 DOI: 10.1016/j.compbiomed.2022.10..	2023
UncertainSCI: A Python Package for Noninvasive Parametric Uncertainty Quantification of Simulation Pipelines	Jess Tate Zexin Liu Jake A. Bergquist Sumientra Rampersad Dan White Chantel Charlebois Lindsay Rupp Dana H. Brooks Rob S. MacLeod Akil Narayan	Journal of Open Source Software	v 8:90, pp 4249 DOI: 10.21105/joss.04249	2023
Uncertainty Quantification of the Effect of Cardiac Position Variability in the Inverse Problem of Electrocardiographic Imaging	Jake Aaron Bergquist Brian Zenger Lindsay Rupp Anna Busatto Jess D Tate Dana H Brooks Akil Narayan Rob MacLeod	Physiological Measurement	v 44:10 DOI: 10.1088/1361-6579/acfc32	2023
Randomized Weakly Admissible Meshes	Yiming Xu Akil Narayan	Journal of Approximation Theory	v 285, pp 105835 DOI: 10.1016/j.jat.2022.105835	2023
Non-Dissipative and Structure-Preserving Emulators via Spherical Optimization	Dihan Dai Yekaterina Epshteyn Akil Narayan	Information and Inference: A Journal of the IMA	v 12:1, pp 494–523 DOI: 10.1093/imaiai/iaac021	2023
Learning Proper Orthogonal Decomposition of Complex Dynamics Using Heavy-ball Neural ODEs	Justin Baker Elena Cherkaev Akil Narayan Bao Wang	Journal of Scientific Computing	v 95:2, pp 54 DOI: 10.1007/s10915-023-02176-8	2023
Convex Optimization-Based Structure-Preserving Filter for Multidimensional Finite Element Simulations	Vidhi Zala Akil Narayan Robert M. Kirby	Journal of Computational Physics	v 492, pp 112364 DOI: 10.1016/j.jcp.2023.112364	2023
Budget-Limited Distribution Learning in Multifidelity Problems	Yiming Xu Akil Narayan	Numerische Mathematik	v 153:1, pp 171–212 DOI: 10.1007/s00211-022-01337-5	2023
A Stieltjes Algorithm for Generating Multivariate Orthogonal Polynomials	Zexin Liu Akil Narayan	SIAM Journal on Scientific Computing	v 45:3, pp A1125-A1147 DOI: 10.1137/22M1477131	2023
A Metalearning Approach for Physics-Informed Neural Networks (PINNs): Application to Parameterized PDEs	Michael Penwarden Shandian Zhe Akil Narayan Robert M. Kirby	Journal of Computational Physics	v 477, pp 111912 DOI: 10.1016/j.jcp.2023.111912	2023
Variational Inference for Nonlinear Inverse Problems via Neural Net Kernels: Comparison to Bayesian Neural Networks, Application to Topology Optimization	Vahid Keshavarzzadeh Robert M. Kirby Akil Narayan	Computer Methods in Applied Mechanics and Engineering	v 400, pp 115495 DOI: 10.1016/j.cma.2022.115495	2022

Publications, continued

Title	Authors	Journal		Year
Uncertainty Quantification for Ecological Models with Random Parameters	Jody R. Reimer Frederick R. Adler Kenneth M. Golden Akil Narayan	Ecology Letters	v 25:10, pp 2232–2244 DOI: 10.1111/ele.14095	2022
Quadrature Sampling of Parametric Models with Bi-fidelity Boosting	Nuojin Cheng Osman Asif Malik Yiming Xu Stephen Becker Alireza Doostan Akil Narayan	SIAM/ASA Journal on Uncertainty Quantification (to appear)	DOI: 10.48550/arXiv.2209.05705	2022
Multifidelity Modeling for Physics-Informed Neural Networks (PINNs)	Michael Penwarden Shandian Zhe Akil Narayan Robert M. Kirby	Journal of Computational Physics	v 451, pp 110844 DOI: 10.1016/j.jcp.2021.110844	2022
Model Reduction of Linear Dynamical Systems via Balancing for Bayesian Inference	Elizabeth Qian Jemima M. Tabeart Christopher Beattie Serkan Gugercin Jiahua Jiang Peter R. Kramer Akil Narayan	Journal of Scientific Computing	v 91:1, pp 29 DOI: 10.1007/s10915-022-01798-8	2022
Model Reduction for Fractional Elliptic Problems Using Kato's Formula	Huy Dinh Harbir Antil Yanlai Chen Elena Cherkaev Akil Narayan	Mathematical Control & Related Fields	v 12:1, pp 115–146 DOI: 10.3934/mcrf.2021004	2022
Hyperbolicity-Preserving and Well-Balanced Stochastic Galerkin Method for Two-Dimensional Shallow Water Equations	Dihan Dai Yekaterina Epshteyn Akil Narayan	Journal of Computational Physics	v 452, pp 110901 DOI: 10.1016/j.jcp.2021.110901	2022
Fast Barycentric-Based Evaluation Over Spectral/Hp Elements	Edward Laughton Vidhi Zala Akil Narayan Robert M. Kirby David Moxey	Journal of Scientific Computing	v 90:2, pp 78 DOI: 10.1007/s10915-021-01750-2	2022
Adaptive Density Tracking by Quadrature for Stochastic Differential Equations	Ryleigh A. Moore Akil Narayan	Applied Mathematics and Computation	v 431, pp 127298 DOI: 10.1016/j.amc.2022.127298	2022
A Bandit-Learning Approach to Multifidelity Approximation	Yiming Xu Vahid Keshavarzzadeh Robert M. Kirby Akil Narayan	SIAM Journal on Scientific Computing	v 44:1, pp A150-A175 DOI: 10.1137/21M1408312	2022
Structure-Preserving Nonlinear Filtering for Continuous and Discontinuous Galerkin Spectral/Hp Element Methods	Vidhi Zala Robert M. Kirby Akil Narayan	SIAM Journal on Scientific Computing	v 43:6, pp A3713-A3732 DOI: 10.1137/20M1337223	2021
Sensitivity Analysis of Random Linear Differential–Algebraic Equations Using System Norms	Roland Pulch Akil Narayan Tatjana Stykel	Journal of Computational and Applied Mathematics	v 397, pp 113666 DOI: 10.1016/j.cam.2021.113666	2021
Robust Topology Optimization with Low Rank Approximation Using Artificial Neural Networks	Vahid Keshavarzzadeh Robert M. Kirby Akil Narayan	Computational Mechanics	v 68, pp 1297–1323 DOI: 10.1007/s00466-021-02069-3	2021
On the Computation of Recurrence Coefficients for Univariate Orthogonal Polynomials	Zexin Liu Akil Narayan	Journal of Scientific Computing	v 88:3, pp 53 DOI: 10.1007/s10915-021-01586-w	2021
Multilevel Designed Quadrature for Partial Differential Equations with Random Inputs	Vahid Keshavarzzadeh Robert M. Kirby Akil Narayan	SIAM Journal on Scientific Computing	v 43:2, pp A1412-A1440 DOI: 10.1137/20M1333407	2021
L1-Based Reduced Over Collocation and Hyper Reduction for Steady State and Time-Dependent Nonlinear Equations	Yanlai Chen Lijie Ji Akil Narayan Zhenli Xu	Journal of Scientific Computing	v 87:1, pp 10 DOI: 10.1007/s10915-021-01416-z	2021
Kernel Optimization for Low-Rank Multifidelity Algorithms	Mani Razi Robert Mike Kirby Akil Narayan	International Journal for Uncertainty Quantification	v 11:1, pp 31–54 DOI: 10.1615/Int.J.UncertaintyQua...	2021
Hyperbolicity-Preserving and Well-Balanced Stochastic Galerkin Method for Shallow Water Equations	Dihan Dai Yekaterina Epshteyn Akil Narayan	SIAM Journal on Scientific Computing	v 43:2, pp A929-A952 DOI: 10.1137/20M1360736	2021
Analysis of the Ratio of ℓ_1 and ℓ_2 Norms in Compressed Sensing	Yiming Xu Akil Narayan Hoang Tran Clayton G. Webster	Applied and Computational Harmonic Analysis	v 55, pp 486–511 DOI: 10.1016/j.acha.2021.06.006	2021
Structure-Preserving Function Approximation via Convex Optimization	Vidhi Zala Mike Kirby Akil Narayan	SIAM Journal on Scientific Computing	v 42:5, pp A3006-A3029 DOI: 10.1137/19M130128X	2020

Publications, continued

Title	Authors	Journal		Year
Stress-Based Topology Optimization under Uncertainty via Simulation-Based Gaussian Process	Vahid Keshavarzzadeh, Robert M. Kirby, Akil Narayan	Computer Methods in Applied Mechanics and Engineering	v 365, pp 112992 DOI: 10.1016/j.cma.2020.112992	2020
Sparse Approximation of Data-Driven Polynomial Chaos Expansions: An Induced Sampling Approach	Ling Guo, Akil Narayan, Yongle Liu, Tao Zhou	Communications in Mathematical Research	v 36:2, pp 128–153 DOI: 10.4208/cmr.2020-0010	2020
Optimal Design for Kernel Interpolation: Applications to Uncertainty Quantification	Akil Narayan, Liang Yan, Tao Zhou	Journal of Computational Physics	v 430, pp 110094 DOI: 10.1016/j.jcp.2020.110094	2020
Generation of Nested Quadrature Rules for Generic Weight Functions via Numerical Optimization: Application to Sparse Grids	Vahid Keshavarzzadeh, Robert M. Kirby, Akil Narayan	Journal of Computational Physics	v 400, pp 108979 DOI: 10.1016/j.jcp.2019.108979	2020
Force-Field Coefficient Optimization of Coarse-Grained Molecular Dynamics Models with a Small Computational Budget	Mani Razi, Akil Narayan, Robert M. Kirby, Dmitry Bedrov	Computational Materials Science	v 176, pp 109518 DOI: 10.1016/j.commatsci.2020.109...	2020
Flexibility Reserve in Power Systems: Definition and Stochastic Multi-Fidelity Optimization	Roohallah Khatami, Masood Parvania, Akil Narayan	IEEE Transactions on Smart Grid	v 11:1, pp 644–654 DOI: 10.1109/TSG.2019.2927600	2020
Efficient Sampling for Polynomial Chaos-Based Uncertainty Quantification and Sensitivity Analysis Using Weighted Approximate Fekete Points	Kyle M. Burk, Akil Narayan, Joseph A. Orr	International Journal for Numerical Methods in Biomedical Engineering	v 36:11, pp e3395 DOI: 10.1002/cnm.3395	2020
Constructing Least-Squares Polynomial Approximations	Ling Guo, Akil Narayan, Tao Zhou	SIAM Review	v 62:2, pp 483–508 DOI: 10.1137/18M1234151	2020
An Efficient Method of Calculating Composition-Dependent Inter-Diffusion Coefficients Based on Compressed Sensing Method	Yi Qin, Akil Narayan, Kaiming Cheng, Peng Wang	Computational Materials Science	v 188, pp 110145 DOI: 10.1016/j.commatsci.2020.110...	2020
A Robust Hyperviscosity Formulation for Stable RBF-FD Discretizations of Advection-Diffusion-Reaction Equations on Manifolds	Varun Shankar, Grady B. Wright, Akil Narayan	SIAM Journal on Scientific Computing	v 42:4, pp A2371-A2401 DOI: 10.1137/19M1288747	2020
Sensitivity Analysis of Random Linear Dynamical Systems Using Quadratic Outputs	Roland Pulch, Akil Narayan	Journal of Computational and Applied Mathematics	v 387, pp 112491 DOI: 10.1016/j.cam.2019.112491	2019
Reduced Basis Methods for Fractional Laplace Equations via Extension	Harbir Antil, Yanlai Chen, Akil Narayan	SIAM Journal on Scientific Computing	v 41:6, pp A3552-A3575 DOI: 10.1137/18M1204802	2019
Polynomial Chaos Expansions for Dependent Random Variables	John D. Jakeman, Fabian Franzelin, Akil Narayan, Michael Eldred, Dirk Plfüger	Computer Methods in Applied Mechanics and Engineering	v 351, pp 643–666 DOI: 10.1016/j.cma.2019.03.049	2019
Parametric Topology Optimization with Multiresolution Finite Element Models	Vahid Keshavarzzadeh, Robert M. Kirby, Akil Narayan	International Journal for Numerical Methods in Engineering	v 119:7, pp 567–589 DOI: 10.1002/nme.6063	2019
Fast Predictive Multi-Fidelity Prediction with Models of Quantized Fidelity Levels	Mani Razi, Robert M. Kirby, Akil Narayan	Journal of Computational Physics	v 376, pp 992–1008 DOI: 10.1016/j.jcp.2018.10.025	2019
Data Assimilation for Models with Parametric Uncertainty	Lun Yang, Yi Qin, Akil Narayan, Peng Wang	Journal of Computational Physics	v 396:1, pp 785–798 DOI: 10.1016/j.jcp.2019.07.020	2019
Convergence Acceleration for Time-Dependent Parametric Multifidelity Models	V. Keshavarzzadeh, R. Kirby, A. Narayan	SIAM Journal on Numerical Analysis	v 57:3, pp 1344–1368 DOI: 10.1137/18M1170339	2019
Balanced Truncation for Model Order Reduction of Linear Dynamical Systems with Quadratic Outputs	Roland Pulch, Akil Narayan	SIAM Journal on Scientific Computing	v 41:4, pp A2270-A2295 DOI: 10.1137/17M1148797	2019
An Error Bound for the Standard Deviation in Model Order Reduction of Linear Stochastic Galerkin Systems	Roland Pulch, Akil Narayan	Proceedings in Applied Mathematics and Mechanics	v 19:1, pp e201900028 DOI: 10.1002/pamm.201900028	2019
An Efficient Solver for Cumulative Density Function-Based Solutions of Uncertain Kinematic Wave Models	Ming Cheng, Akil Narayan, Yi Qin, Peng Wang, Xinghui Zhong, Xueyu Zhu	Journal of Computational Physics	v 382, pp 138–151 DOI: 10.1016/j.jcp.2019.01.008	2019

Publications, continued

Title	Authors	Journal		Year
Allocation Strategies for High Fidelity Models in the Multifidelity Regime	Daniel J. Perry Robert M. Kirby Akil Narayan Ross T. Whitaker	SIAM/ASA Journal on Uncertainty Quantification	v 7:1, pp 203–231 DOI: 10.1137/17M1144714	2019
A Robust Error Estimator and a Residual-Free Error Indicator for Reduced Basis Methods	Yanlai Chen Jiahua Jiang Akil Narayan	Computers & Mathematics with Applications	v 77:7, pp 1963–1979 DOI: 10.1016/j.camwa.2018.11.032	2019
RBF-LOI: Augmenting Radial Basis Functions (RBFs) with Least Orthogonal Interpolation (LOI) for Solving PDEs on Surfaces	Varun Shankar Akil Narayan Robert M. Kirby	Journal of Computational Physics	v 373, pp 722–735 DOI: 10.1016/j.jcp.2018.07.015	2018
Computation of induced orthogonal polynomial distributions	Akil Narayan	Electronic Transactions on Numerical Analysis	v 50, pp 71–97 DOI: 10.1553/etna_vol50s71	2018
Weighted Approximate Fekete Points: Sampling for Least-Squares Polynomial Approximation	Ling Guo Akil Narayan Liang Yan Tao Zhou	SIAM Journal on Scientific Computing	v 40:1, pp A366-A387 DOI: 10.1137/17M1140960	2018
Practical Error Bounds for a Non-Intrusive Bi-Fidelity Approach to Parametric/Stochastic Model Reduction	Jerrad Hampton Hillary R. Fairbanks Akil Narayan Alireza Doostan	Journal of Computational Physics	v 368, pp 315–332 DOI: 10.1016/j.jcp.2018.04.015	2018
Numerical Integration in Multiple Dimensions with Designed Quadrature	Vahid Keshavarzzadeh Robert M. Kirby Akil Narayan	SIAM Journal on Scientific Computing	v 40:4, pp A2033-A2061 DOI: 10.1137/17M1137875	2018
Generation and Application of Multivariate Polynomial Quadrature Rules	John D. Jakeman Akil Narayan	Computer Methods in Applied Mechanics and Engineering	v 338, pp 134–161 DOI: 10.1016/j.cma.2018.04.009	2018
Fast Predictive Models Based on Multi-Fidelity Sampling of Properties in Molecular Dynamics Simulations	Mani Razi Akil Narayan Robert M. Kirby Dmitry Bedrov	Computational Materials Science	v 152, pp 125–133 DOI: 10.1016/j.commatsci.2018.05....	2018
Compressed Sensing with Sparse Corruptions: Fault-Tolerant Sparse Collocation Approximations	Ben Adcock Anyi Bao John D. Jakeman Akil Narayan	SIAM/ASA Journal on Uncertainty Quantification	v 6:4, pp 1424–1453 DOI: 10.1137/17M112590X	2018
A Gradient Enhanced ℓ_1-Minimization for Sparse Approximation of Polynomial Chaos Expansions	Ling Guo Akil Narayan Tao Zhou	Journal of Computational Physics	v 367, pp 49–64 DOI: 10.1016/j.jcp.2018.04.026	2018
Stochastic Collocation Methods via L1 Minimization Using Randomized Quadratures	Ling Guo Akil Narayan Tao Zhou Yuhang Chen	SIAM Journal on Scientific Computing	v 39:1, pp A333-A359 DOI: 10.1137/16M1059680	2017
Sequential Data Assimilation with Multiple Nonlinear Models and Applications to Subsurface Flow	Lun Yang Akil Narayan Peng Wang	Journal of Computational Physics	v 346, pp 356–368 DOI: 10.1016/j.jcp.2017.06.026	2017
Offline-Enhanced Reduced Basis Method Through Adaptive Construction of the Surrogate Training Set	Jiahua Jiang Yanlai Chen Akil Narayan	Journal of Scientific Computing	v 73:2-3, pp 853–875 DOI: 10.1007/s10915-017-0551-3	2017
Numerical Computation of Weil–Peterson Geodesics in the Universal Teichmüller Space	Matt Feiszli Akil Narayan	SIAM Journal on Imaging Sciences	v 10:3, pp 1322–1345 DOI: 10.1137/15M1043947	2017
Effectively Subsampled Quadratures for Least Squares Polynomial Approximations	Pranay Seshadri Akil Narayan Sankaran Mahadevan	SIAM/ASA Journal on Uncertainty Quantification	v 5:1, pp 1003–1023 DOI: 10.1137/16M1057668	2017
An Orthogonality Property of the Legendre Polynomials	Len Bos Akil Narayan Norman Levenberg Federico Piazzon	Constructive Approximation	v 45:1, pp 65–81 DOI: 10.1007/s00365-015-9321-3	2017
A Generalized Sampling and Preconditioning Scheme for Sparse Approximation of Polynomial Chaos Expansions	John Jakeman Akil Narayan Tao Zhou	SIAM Journal on Scientific Computing	v 39:3, pp A1114-A1144 DOI: 10.1137/16M1063885	2017
A Christoffel Function Weighted Least Squares Algorithm for Collocation Approximations	Akil Narayan John Jakeman Tao Zhou	Mathematics of Computation	v 86:306, pp 1913–1947 DOI: 10.1090/mcom/3192	2017
A Goal-Oriented Reduced Basis Methods-Accelerated Generalized Polynomial Chaos Algorithm	Jiang Jiang Yanlai Chen Akil Narayan	SIAM/ASA Journal on Uncertainty Quantification	v 4:1, pp 1398–1420 DOI: 10.1137/16M1055736	2016
Weighted Discrete Least-Squares Polynomial Approximation Using Randomized Quadratures	Tao Zhou Akil Narayan Dongbin Xiu	Journal of Computational Physics	v 298, pp 787–800 DOI: 10.1016/j.jcp.2015.06.042	2015
Stochastic Collocation on Unstructured Multivariate Meshes	Akil Narayan Tao Zhou	Communications in Computational Physics	v 18:01, pp 1–36 DOI: 10.4208/cicp.020215.070515a	2015

Publications, continued

Title	Authors	Journal		Year
A Reduced Radial Basis Function Method for Partial Differential Equations on Irregular Domains	Yanlai Chen, Sigal Gottlieb, Alfa Heryudono, Akil Narayan	Journal of Scientific Computing	v 66:1, pp 67–90 DOI: 10.1007/s10915-015-0013-8	2015
Multivariate Discrete Least-Squares Approximations with a New Type of Collocation Grid	Tao Zhou, Akil Narayan, Zhiqiang Xu	SIAM Journal on Scientific Computing	v 36:5, pp A2401-A2422 DOI: 10.1137/130950434	2014
Computational Aspects of Stochastic Collocation with Multifidelity Models	Xueyu Zhu, Akil Narayan, Dongbin Xiu	SIAM/ASA Journal on Uncertainty Quantification	v 2:1, pp 444–463 DOI: 10.1137/130949154	2014
Approximating the Weil–Petersson Metric Geodesics on the Universal Teichmüller Space by Singular Solutions	Sergey Kushnarev, Akil Narayan	SIAM Journal on Imaging Sciences	v 7:2, pp 900–923 DOI: 10.1137/120898565	2014
Adaptive Leja Sparse Grid Constructions for Stochastic Collocation and High-Dimensional Approximation	Akil Narayan, John Jakeman	SIAM Journal on Scientific Computing	v 36:6, pp A2952-A2983 DOI: 10.1137/140966368	2014
A Stochastic Collocation Algorithm with Multifidelity Models	Akil Narayan, Claude Gittelson, Dongbin Xiu	SIAM Journal on Scientific Computing	v 36:2, pp A495-A521 DOI: 10.1137/130929461	2014
Minimal Multi-Element Stochastic Collocation for Uncertainty Quantification of Discontinuous Functions	John D. Jakeman, Akil Narayan, Dongbin Xiu	Journal of Computational Physics	v 242, pp 790–808 DOI: 10.1016/j.jcp.2013.02.035	2013
Constructing Nested Nodal Sets for Multivariate Polynomial Interpolation	Akil Narayan, Dongbin Xiu	SIAM Journal on Scientific Computing	v 35:5, pp A2293-A2315 DOI: 10.1137/12089613X	2013
A Generalization of the Wiener Rational Basis Functions on Infinite Intervals. Part II — Numerical Investigation	Akil C. Narayan, Jan S. Hesthaven	Journal of Computational and Applied Mathematics	v 237:1, pp 18–34 DOI: 10.1016/j.cam.2012.06.036	2013
Stochastic Collocation Methods on Unstructured Grids in High Dimensions via Interpolation	Akil Narayan, Dongbin Xiu	SIAM Journal on Scientific Computing	v 34:3, pp A1729-A1752 DOI: 10.1137/110854059	2012
Sequential Data Assimilation with Multiple Models	Akil Narayan, Youssef Marzouk, Dongbin Xiu	Journal of Computational Physics	v 231:19, pp 6401–6418 DOI: 10.1016/j.jcp.2012.06.002	2012
Computation of Connection Coefficients and Measure Modifications for Orthogonal Polynomials	Akil Narayan, Jan Hesthaven	BIT Numerical Mathematics	v 52:2, pp 457–483 DOI: 10.1007/s10543-011-0363-z	2012
Distributional Sensitivity for Uncertainty Quantification	Akil Narayan, Dongbin Xiu	Communications in Computational Physics	v 10, pp 140–160 DOI: 10.4208/cicp.160210.300710a	2011
A Generalization of the Wiener Rational Basis Functions on Infinite Intervals: Part I–Derivation and Properties	Akil C. Narayan, Jan S. Hesthaven	Mathematics of Computation	v 80, pp 1557–1583 DOI: 10.1090/S0025-5718-2010-0243..	2011

Conference proceedings

Title	Authors	Venue		Year
Meta-Learning with Adjoint Methods	Shibo Li, Zheng Wang, Akil Narayan, Robert Kirby, Shandian Zhe	AISTATS 2023: Proceedings of the 26th International Conference on Artificial Intelligence and Statistics	v 206, pp 7239–7251 Link	2023
Meta Learning of Interface Conditions for Multi-Domain Physics-Informed Neural Networks	Shibo Li, Michael Penwarden, Yiming Xu, Conor Tillinghast, Akil Narayan, Mike Kirby, Shandian Zhe	ICML 2023: Proceedings of the 40th International Conference on Machine Learning	pp 19855–19881 Link	2023
Largest Angle Path Distance for Multi-Manifold Clustering	Haoyu Chen, Anna Little, Akil Narayan	2023 International Conference on Sampling Theory and Applications (SampTA)	pp 1–7 DOI: 10.1109/SampTA59647.2023.103	2023
Uncertainty Quantification of Cardiac Position on Deep Graph Network ECGI	Xiajun Jiang, Jess Tate, Jake Bergquist, Akil Narayan, Rob MacLeod, Linwei Wang	CinC 2022: Computing in Cardiology 2022	v 49 DOI: 10.22489/CinC.2022.425	2022
Nonparametric Embeddings of Sparse High-Order Interaction Events	Zheng Wang, Yiming Xu, Conor Tillinghast, Shibo Li, Akil Narayan, Shandian Zhe	ICML 2022: Proceedings of the 39th International Conference on Machine Learning	v 162, pp 23237–23253 Link	2022

Conference proceedings, continued

Title	Authors	Venue		
Heart Position Uncertainty Quantification in the Inverse Problem of Ecgi	Jake A Bergquist, Lindsay C Rupp, Anna Busatto, Ben Orkild, Brian Zenger, Wilson Good, Jaume Coll-Font, Akil Narayan, Jess Tate, Dana Brooks, others	CinC 2022: Computing in Cardiology 2022	v 49, pp 1–4 DOI: 10.22489/CinC.2022.374	2022
Bayesian Continuous-Time Tucker Decomposition	Shikai Fang, Akil Narayan, Robert Kirby, Shandian Zhe	ICML 2022: Proceedings of the 39th International Conference on Machine Learning	v 162, pp 6235–6245 Link	2022
Uncertainty Quantification of the Effects of Segmentation Variability in ECGI	Jess D. Tate, Wilson W. Good, Nejib Zemzemi, Machteld Boonstra, Peter van Dam, Dana H. Brooks, Akil Narayan, Rob S. MacLeod	CinC 2021: Functional Imaging and Modeling of the Heart	pp 515–522 DOI: 10.1007/978-3-030-78710-3_49	2021
Uncertainty Quantification in Simulations of Myocardial Ischemia	Jake A Bergquist, Brian Zenger, Lindsay C Rupp, Akil Narayan, Jess Tate, Rob S MacLeod	CinC 2021: 2021 Computing in Cardiology (CinC)	v 48, pp 1–4 DOI: 10.23919/CinC53138.2021.9662..	2021
The Role of Myocardial Fiber Direction in Epicardial Activation Patterns via Uncertainty Quantification	Lindsay C Rupp, Jake A Bergquist, Brian Zenger, Karli Gillette, Akil Narayan, Jess D Tate, Gernot Plank, Rob S MacLeod	CinC 2021: 2021 Computing in Cardiology (CinC)	v 48, pp 1–4 DOI: 10.23919/CinC53138.2021.9662..	2021
Using UncertainSCI to Quantify Uncertainty in Cardiac Simulations	Lindsay C Rupp, Zexin Liu, Jake A Bergquist, Sumientra Rampersad, Dan White, Jess D Tate, Dana H Brooks, Akil Narayan, Rob S MacLeod	CinC 2020: 2020 Computing in Cardiology	pp 1–4 DOI: 10.22489/CinC.2020.275	2020
A Comparison of Methods for Examining the Effect of Uncertainty in the Conductivities in a Model of Partial Thickness Ischaemia	Barbara M Johnston, Akil Narayan, Peter R Johnston	CinC 2019: 2019 Computing in Cardiology (CinC)	pp Page 1-Page 4 DOI: 10.23919/CinC49843.2019.9005..	2019
Continuous-Time Stochastic Modeling and Estimation of Electricity Load	Roohallah Khatami, Masood Parvania, Pramod Khargonekar, Akil Narayan	CDC 2018: 2018 IEEE Conference on Decision and Control (CDC)	pp 3988–3993 DOI: 10.1109/CDC.2018.8619042	2018
Sampling High Dimensional Optimal Measures	Akil Narayan	ICNAAM 2013: 11th International Conference of Numerical Analysis and Applied Mathematics 2013: ICNAAM 2013	v 1558, pp 902–905 DOI: 10.1063/1.4825644	2013

Preprints

Title	Authors		
Conformal Finite Element Methods for Nonlinear Rosenau-Burgers-Biharmonic Models	Ankur Ram Jiwari, Akil Narayan	DOI: 10.48550/arXiv.2402.08926	2024
Multi-Resolution Active Learning of Fourier Neural Operators	Shibo Li, Xin Yu, Wei Xing, Mike Kirby, Akil Narayan, Shandian Zhe	DOI: 10.48550/arXiv.2309.16971	2023

Preprints, continued

Title	Authors		
Energy Stable and Structure-Preserving Schemes for the Stochastic Galerkin Shallow Water Equations	Dihan Dai Yekaterina Epshteyn Akil Narayan	DOI: 10.48550/arXiv.2310.06229	2023
An Approximate Control Variates Approach to Multifidelity Distribution Estimation	Ruijian Han Boris Kramer Dongjin Lee Akil Narayan Yiming Xu	DOI: 10.48550/arXiv.2303.06422	2023
Proximal Implicit ODE Solvers for Accelerating Learning Neural ODEs	Justin Baker Hedi Xia Yiwei Wang Elena Cherkaev Akil Narayan Long Chen Jack Xin Andrea L. Bertozzi Stanley J. Osher Bao Wang	Link	2022
Fast Algorithms for Monotone Lower Subsets of Kronecker Least Squares Problems	Osman Asif Malik Yiming Xu Nuojin Cheng Stephen Becker Alireza Doostan Akil Narayan	DOI: 10.48550/arXiv.2209.05662	2022
Dimensionality Reduction in Deep Learning via Kronecker Multi-layer Architectures	Jarom D. Hogue Robert M. Kirby Akil Narayan	Link	2022
GP-HMAT: Scalable, $O(N\log(n))$ Gaussian Process Regression with Hierarchical Low-Rank Matrices	Vahid Keshavarzzadeh Shandian Zhe Robert M. Kirby Akil Narayan	Link	2021

Pedagogy and courses

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Courses taught

Title	Term + Year	Course number + institution	
Applied Complex Variables and Asymptotic Methods	Spring 2024	MATH 6720	University of Utah
Analysis of Numerical Methods, II	Spring 2024	MATH 6620	University of Utah
Introduction to Mathematical Finance	Fall 2023	MATH 5760 MATH 6890	University of Utah
Numerical Solutions of Partial Differential Equations	Spring 2023	MATH 6630	University of Utah
Applied Complex Variables and Asymptotic Methods	Spring 2023	MATH 6720	University of Utah
Advanced Optimization	Spring 2022	MATH 6880 MATH 7875	University of Utah
Introduction to Optimization	Fall 2021	MATH 5770 MATH 6640 ME EN 6025	University of Utah
Partial Differential Equations for Engineering Students	Spring 2021	MATH 3150	University of Utah
Analysis of Numerical Methods	Fall 2020	MATH 6610	University of Utah
Linear Algebra	Fall 2019	MATH 2250	University of Utah
Analysis of Numerical Methods	Fall 2019	MATH 6610	University of Utah
Topics in Numerical Methods for PDE's	Spring 2019	MATH 6630	University of Utah
Partial Differential Equations for Engineering Students	Spring 2019	MATH 3150	University of Utah
Orthogonal polynomials and spectral methods for PDE's	Fall 2018	MATH 5750 MATH 6880	University of Utah
Partial Differential Equations for Engineering Students	Spring 2018	MATH 3150	University of Utah
Analysis of Numerical Methods	Fall 2017	MATH 6610	University of Utah
Partial Differential Equations for Engineering Students	Spring 2017	MATH 3150	University of Utah
Calculus II	Fall 2016	MATH 1220	University of Utah

Courses taught, continued

Title	Term + Year	Course number + institution	
Introduction to Discrete Structures II	Spring 2015	MTH 182	University of Massachusetts Dartmouth
High Performance Scientific Computing	Spring 2015	EAS 520	University of Massachusetts Dartmouth
Advanced Mathematical Methods	Fall 2014	EAS 501	University of Massachusetts Dartmouth
Probability	Spring 2014	MTH 331	University of Massachusetts Dartmouth
Differential Equations	Spring 2014	MTH 212	University of Massachusetts Dartmouth
Introduction to Discrete Structures	Fall 2013	MTH 181	University of Massachusetts Dartmouth
College Algebra	Fall 2013	MTH 101	University of Massachusetts Dartmouth
Introduction to Discrete Structures II	Spring 2013	MTH 182	University of Massachusetts Dartmouth
Differential Equations	Spring 2013	MTH 212	University of Massachusetts Dartmouth
Probability	Fall 2012	MTH 331	University of Massachusetts Dartmouth
Introduction to Discrete Structures	Fall 2012	MTH 181	University of Massachusetts Dartmouth
Multivariable Calculus	Fall 2011	MA271	Purdue University
Multivariable Calculus	Fall 2010	MA271	Purdue University
Introduction to Computing Sciences	Spring 2008	AM16	Brown University

Mini-courses and guest lectures

Title	Term + Year	Course number + institution		Note
Numerical methods for stochastic computations	Summer 2013		Shanghai Jiaotong University	Co-Instructor
International Summer School on Scientific Computing 2013: Uncertainty Quantification	Summer 2013		Chinese Academy of Sciences	Co-Instructor
Numerical Integration	Spring 2012		SAMSI: Statistical and Applied Mathematical Sciences Institute	Undergraduate workshop
Introduction to Uncertainty Quantification	Spring 2010	ME597 AAE590	Purdue University	Guest lecturer

Mentoring (Back to top)

Postdoctoral scholars mentored

Name	Appointment Unit	Institution		
Debdeep Bhattacharya	Department of Mathematics	University of Utah	2023–present	Jointly advised w/ Ken Golden, Bao Wang
Jarom Hogue	SCI Institute	University of Utah	2021–2023	Jointly advised w/ Mike Kirby
Ehsan Adeli	SCI Institute	University of Utah	2020–2021	Jointly advised w/ Mike Kirby
Vahid Keshavarzzadeh	SCI Institute	University of Utah	2017–2022	Jointly advised w/ Mike Kirby
Mani Razi	SCI Institute	University of Utah	2016–2019	Jointly advised w/ Mike Kirby

Graduate students supervised

Yinqian Yu	PhD, Mathematics	University of Utah	2028 (expected)	(Joint w/ Yekaterina Epshteyn)
John Turnage	PhD, Mathematics	University of Utah	2027 (expected)	
Filip Belik	PhD, Mathematics	University of Utah	2027 (expected)	(Joint w/ Christel Hohenegger)
Haoyu Chen	PhD, Mathematics	University of Utah	2026 (expected)	(Joint w/ Anna Little)
Yiming Xu	PhD, Mathematics	University of Utah	2022	(Joint w/ Tom Alberts)
Ryleigh Moore	PhD, Mathematics	University of Utah	2022	
Zexin Liu	PhD, Mathematics	University of Utah	2022	
Dihan Dai	PhD, Mathematics	University of Utah	2022	(Joint w/ Yekaterina Epshteyn)
Xuesong Bai	PhD, Mathematics	University of Utah	2022	(Joint w/ Elena Cherkaev)
Vidhi Zala	PhD, Computing	University of Utah	2021	(Joint w/ Mike Kirby, formal advisor)

Graduate students supervised, continued

Erin Linebarger	PhD, Mathematics	University of Utah	2020	
Jiahua Jiang	PhD, Engineering and Applied Science	University of Massachusetts Dartmouth	2018	(Joint w/ Yanlai Chen)

Graduate student committee service

Xi Zhong	PhD, Electrical and Computer Engineering	University of Utah	2027 (expected)
Taos Transue	PhD, Mathematics	University of Utah	2026 (expected)
Anna Busatto	PhD, Biomedical Engineering	University of Utah	2026 (expected)
Madison Cooley	PhD, Computing	University of Utah	2025 (expected)
Lindsay Rupp	PhD, Biomedical Engineering	University of Utah	2024 (expected)
Michael Penwarden	PhD, Computing	University of Utah	2024 (expected)
Andrew Liu	PhD, Mathematics	University of Utah	2024 (expected)
Shibo Li	PhD, Computing	University of Utah	2024 (expected)
Shikai Fang	PhD, Computing	University of Utah	2024 (expected)
Justin Baker	PhD, Mathematics	University of Utah	2024 (expected)
Zheng Wang	PhD, Computing	University of Utah	2023
Trent DeGiovanni	PhD, Mathematics	University of Utah	2023
Nuojin Cheng	PhD, Aerospace Engineering	UC Boulder	2023
Juan Cardenas	PhD, Mathematics	Simon Fraser University	2023
Jake Bergquist	PhD, Biomedical Engineering	University of Utah	2023
Ryeongkyung Yoon	PhD, Mathematics	University of Utah	2022
Nathan Willis	PhD, Mathematics	University of Utah	2022
Thuong Nguyen	PhD, Mathematics	University of Utah	2022
Max Carlson	PhD, Computing	University of Utah	2022
Conor Tillinghast	PhD, Mathematics	University of Utah	2021
Loren Santana	PhD, Mathematics	University of Utah	2021
Jing Li	PhD, Computing	University of Utah	2021
Laurent van den Bos	PhD, Mathematics	Delft University of Technology	2020
David Harman	PhD, Mathematics	Griffith University	2020
Zhaopeng Hao	PhD, Mathematics	Worcester Polytechnic Institute	2020
Qing Xia	PhD, Mathematics	University of Utah	2019
Roohallah Khatami	PhD, Electrical and Computer Engineering	University of Utah	2019
Savannah Crawford	MS, Mathematics	University of Utah	2024 (expected)
Kaitlin O'Dell	MS, Mathematics	University of Utah	2023
Wim Cardeon	MSTAT, Mathematics	University of Utah	2023
Michael Northup	MSTAT, Mathematics	University of Utah	2022
Huy Dinh	MSTAT, Mathematics	University of Utah	2019

Undergraduate student projects supervised

NAME	INSTITUTION	PROJECT TERM	PROJECT TYPE
Guang Yang	University of Utah		Research project
Zhenzhao Tu	University of Utah	2022	Research project; transferred to U Wisconsin
Parth Rastogi	University of Utah	2021	Research project
Vignesh Iyer	University of Utah	2021	Comp math capstone project
Jacia Abplanalp	University of Utah	2021	Comp math capstone project
Sean O'Hagan		2020	Summer@ICERM REU-type project
Shubham Makharia		2020	Summer@ICERM REU-type project
Chloe Makdad		2020	Summer@ICERM REU-type project
Catherine Huang		2020	Summer@ICERM REU-type project
Max Daniels		2020	Summer@ICERM REU-type project

Undergraduate student projects supervised, continued

NAME	Institution	Project term	Project type
Madison Crim		2020	Summer@ICERM REU-type project
Rishi Advani		2020	Summer@ICERM REU-type project
Gurpartap Bhatti	University of Utah	2018	Comp math capstone project

Invited Talks

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Seminars and colloquia

Applied and Computational Mathematics Seminar	Auburn University	2024
Numerical Anslysis of Galerkin ROMs Seminar Series	Online	2023
Data Science Seminar	Purdue University	2022
MiC: Mathematics in Computing Seminar	ORNL: Oak Ridge National Laboratory	2022
Mathematics Seminar	Ocean University of China	2022
Mathematics colloquium	Virginia Tech	2020
Signal Processing, Imaging, Reasoning, and Learning (SPIRAL) seminar	Northeastern University	2020
Introductory talks for semester program	ICERM: Institute for Computational and Experimental Research in Mathematics	2020
Sayas Numerics Seminar	George Mason University	2020
CWI Seminar	Centrum Wiskunde & Informatica	2020
Applied mathematics seminar	University of Utah	2018
Mathematics colloquium	University of Iowa	2018
Computational Mathematics, Science, and Engineering (CMSE) Colloquium	Michigan State University	2018
Computational Engineering Seminar	Cambridge University	2018
Applied Mathematics seminar	Arizona State University	2018
Applied Mathematics Seminar	Alan Turing Institute	2018
Mathematics Colloquium	WPI: Worcester Polytechnic Institute	2017
Applied mathematics seminar	University of Utah	2017
Applied mathematics seminar	UC Santa Cruz	2017
Applied Mathematics Seminar	Simon Fraser University	2017
Mathematics seminar	Beihang University	2017
Data Science Seminar	University of Utah	2016
Mathematics Seminar	ShanghaiTech University	2016
Mathematics seminar	Shanghai Jiao Tong University	2016
Applied Mathematics and Statistics Seminar	Johns Hopkins University	2016
Mathematics seminar	Wheaton College	2015
Mathematics colloquium	Virginia Tech	2015
Mathematics colloquium	University of Utah	2015
Applied Mathematics seminar	University of Macau	2015
Mathematics colloquium	Southern Methodist University	2015
Mathematics seminar	Shanghai Normal University	2015
Computing seminar	NIST: National Institutes of Standards and Technology	2015
Short Course on Uncertainty Quantification	IMA: Institute for Mathematics and its Applications	2015
Graduate student seminar	George Mason University	2015
Mathematics seminar	Chinese Academy of Sciences	2015
Mathematics seminar	Bowdoin College	2015
Applied mathematics seminar	Beihang University	2015
Mathematics seminar	Hong Kong Baptist University	2014
Mathematics seminar	Shanghai Jiao Tong University	2013
AeroAstro Seminar	MIT	2013

Applied Mathematics Seminar	Illinois Institute of Technology	2013
Mathematics seminar	Chinese Academy of Sciences	2013
Mathematics seminar	UMass Dartmouth	2012
Postdoctoral seminar	Statistical and Applied Mathematical Sciences Institute	2012
Computing seminar	Sandia National Laboratories	2012
Undergraduate workshop	SAMSI: Statistical and Applied Mathematical Sciences Institute	2012
Introductory talks for semester program	ICERM: Institute for Computational and Experimental Research in Mathematics	2012
Applied Math Seminar	Purdue University	2011
Seminar talk	Lawrence Livermore National Laboratory	2010
Applied Math Seminar	Purdue University	2009

Talks at Conferences and workshops

North American High Order Methods Conference	2024
USNCCM: US National Congress on Computational Mechanics	2023
Summer Biomechanics, Bioengineering, and Biotransport Conference	2023
Mathematical Opportunities in Digital Twins	2023
SIAM Conference on Uncertainty Quantification	2022
SIAM Conference on the Mathematics of Data Science	2022
CinC: Computing in Cardiology	2022
AMS Fall Western Sectional Meeting	2022
USNCCM: US National Congress on Computational Mechanics	2021
SIAM Conference on Computational Science and Engineering	2021
IEEE EMBS Conference on Neural Engineering	2021
FIMH: Functional Imaging and Modeling of the Heart	2021
COUPLED: International Conference on Coupled Problems in Science and Engineering	2021
USNCCM: US National Congress on Computational Mechanics	2019
SIAM Conference on Computational Science and Engineering	2019
ICIAM Congress	2019
Conference on Computational Mathematics and Applications	2019
16th International Conference on Approximation Theory	2019
WCCM: World Congress on Computational Mechanics	2018
SIAM Conference on Uncertainty Quantification	2018
Model Uncertainty: Mathematical and Statistical (MUMS) Opening Workshop at SAMSI	2018
International Symposium on Computational Harmonic Analysis	2018
ICOSAHOM: International Conference on Spectral and High Order Methods	2018
Curves and Surfaces	2018
Current Trends and Challenges in Data Science and Uncertainty Quantification	2018
Statistical Perspectives of Uncertainty Quantification	2017
SIAM Conference on Computational Science and Engineering	2017
SIAM Central States Section Meeting	2017
SIAM Annual Meeting	2017
ENUMATH: European Conference on Numerical Mathematics and Advanced Applications	2017
CAM-ICCM Workshop: CAM Conference on Geometry and Imaging	2017
SIAM Conference on Uncertainty Quantification	2016
USNCCM: US National Congress on Computational Mechanics	2015
UQ-QUEST: International Conference on Quantification of Uncertainty in Engineering, Sciences and Technology	2015
SIAM Conference on Computational Science and Engineering	2015
SIAM Conference on Computational Science and Engineering	2015
SIAM Conference on Analyais of Partial Differential Equations	2015
ICIAM Congress	2015
AMS Spring Southeastern Sectional Meeting	2015
SIAM Conference on Uncertainty Quantification	2014

SIAM Conference on Imaging Sciences	2014
SIAM Annual Meeting	2014
International Workshop on Mathematical Geometry Processing and Applications	2014
ICOSAHOM: International Conference on Spectral and High Order Methods	2014
Constructive Functions	2014
SIAM Conference on Computational Science and Engineering	2013
ROM in GR @ Caltech	2013
New Frontiers in Numerical Analysis and Scientific Computing (LR60)	2013
ICNAAM: International Conference of Numerical Analysis and Applied Mathematics	2013
14th International Conference on Approximation Theory	2013
SIAM Conference on Uncertainty Quantification	2012
SIAM Conference on Computational Science and Engineering	2011
SciDAC onference	2011
Midwest Numerical Analysis Day	2011
ICIAM Congress	2011
SIAM Annual Meeting	2010
SIAM Conference on Computational Science and Engineering	2009
SIAM Annual Meeting	2009
AMS Joint Math Meetings	2009

University Service

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	Unit	Institution	Unit
Graduate Recruitment Committee	Department of Mathematics	University of Utah	2023–present
Equity, Diversity, and Inclusion Committee	Department of Mathematics	University of Utah	2023–present
Executive Committee	Department of Mathematics	University of Utah	2021–2023
Biomedical/HPC Hiring comimttee	Scientific Computing and Imaging Institute	University of Utah	2021–2022
Senate Faculty Standards and Review Committee		University of Utah	2020–present
Hiring Committee	Department of Mathematics	University of Utah	2020–2021
Applied Math Seminar co-organizer	Department of Mathematics	University of Utah	2020–present
Hiring Committee	Scientific Computing and Imaging Institute	University of Utah	2019–2020
Graduate Recruitment Committee	Department of Mathematics	University of Utah	2019–2020
Data Science Hiring Committee	Department of Mathematics	University of Utah	2017–2018
Colloquium Committee	Department of Mathematics	University of Utah	2016–2019
Webpage administrator	Center for Scientific Computing and Visualization Research	University of Massachusetts Dartmouth	2013–2015
Math and Computational Science seminar series co-organizer	Center for Scientific Computing and Visualization Research	University of Massachusetts Dartmouth	2013–2015
Faculty search committee	Computer and Information Sciences Department	University of Massachusetts Dartmouth	2013–2014
Faculty Senate		University of Massachusetts Dartmouth	2013–2015
Assessment Committee	Mathematics Department	University of Massachusetts Dartmouth	2013–2015

Professional Service

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Conference/Program Organizing Committees

Title	Location	Year
NSF Computational Mathematics PI Meeting	University of Washington, Seattle, WA, USA	2024

Title	Location	Year
Computational learning for model reduction	ICERM: Institute for Computational and Experimental Research in Mathematics, Providence, RI, USA	2024
Summer Program: Fast Learning Algorithms for Numerical Computation and Data Analysis	ICERM: Institute for Computational and Experimental Research in Mathematics, Providence, RI, USA	2020
Semester Program: Model and Dimension Reduction in Uncertain and Dynamic Systems	ICERM: Institute for Computational and Experimental Research in Mathematics, Providence, RI, USA	2020
SIAM Conference on Uncertainty Quantification	Orange County, CA, USA	2018

Editorial service

Journal	Role	Term	Notes
SIAM Journal on Scientific Computing	Associate Editor	2022–present	
Journal of Approximation Software	Associate Editor	2022–present	
Advances in Computational Mathematics	Associate Editor	2022–present	
Advances in Continuous and Discrete Models	Associate Editor	2021–present	
Journal of Scientific Computing	Guest Editor	2020–2020	Topical Collection on Model Order Reduction
International Journal on Uncertainty Quantification	Associate Editor	2020–present	

Minisymposium/Special Sessions Organized

Conference	Session type	Session title	Location	Year
Computing in Cardiology	Special session	Addressing and assessing uncertainty in cardiac simulations	Tampere, Finland	2022
AMS Fall Western Sectional Meeting	Special session	Approximation Theory and Numerical Analysis	Salt Lake City, UT, USA	2022
SIAM Conference on Computational Science and Engineering	Minisymposium	Computational Modeling of Uncertainty in Biomedical Simulations	Virtual	2021
IEEE EMBS Conference on Neural Engineering	Minisymposium	Uncertainty Quantification for Simulations of Neuromodulation	Virtual	2021
Functional Imaging and Modeling of the Heart	Workshop	Uncertainty Quantification Workshop	Stanford, CA, USA	2021
AMS Fall Western Sectional Meeting	Special session	Approximation Theory and Numerical Analysis	Virtual	2020
SIAM Conference on Computational Science and Engineering	Minisymposium	Model reduction, adaptivity, and high dimensionality in uncertainty quantification	Spokane, WA, USA	2019
Approximation Theory 16	Minisymposium	Advances in high-dimensional approximation	Nashville, TN, USA	2019
World Congress on Computational Mechanics	Minisymposium	Multi-fidelity Simulation and Modeling in Computational Science and Engineering	New York, NY, USA	2018
SIAM Conference on Uncertainty Quantification	Minisymposium	Sparse approximation algorithms for high-dimensional problems in uncertainty quantification	Orange County, CA, USA	2018
ICOSAHOM	Minisymposium	Sparsity-based methods for high-dimensional approxima- tion in uncertainty quantification	London, UK	2018
ICOSAHOM	Minisymposium	Multifidelity and multilevel simulation and approximation in the computational sciences	London, UK	2018
SIAM Conference on Computational Science and Engineering	Minisymposium	Multifidelity simulation and approximation in the computational sciences	Atlanta, GA, USA	2017
SIAM Conference on Computational Science and Engineering	Minisymposium	Collocation methods for high-dimensional parameterized problems in uncertainty quantification	Atlanta, GA, USA	2017
SIAM Annual Meeting	Minisymposium	Multifidelity Approaches in Uncertainty Quantification	Pittsburgh, PA, USA	2017
SIAM Conference on Uncertainty Quantification	Minisymposium	Theoretical and Computational Advances in Collocation Approximations for High-Dimensional Problems	Lausanne, Switzerland	2016

Minisymposium/special session organization, continued

CONFERENCE	SESSION TYPE	SESSION TITLE	LOCATION	YEAR
SIAM Conference on Imaging Science	Minisymposium	Theoretical and Computational Aspects of Geometric Shape Analysis	Albuquerque, NM, USA	2016
SIAM Annual Meeting	Minisymposium	Reduced Order Modeling Techniques in Uncertainty Quantification	Boston, MA, USA	2016
ICIAM Congress	Minisymposium	Theoretical and computational aspects of geometric shape analysis	Beijing, China	2015
Approximation Theory 15	Minisymposium	Advances in parametric approximations in computational science	San Antonio, TX, USA	2015
SIAM Conference on Imaging Science	Minisymposium	Theoretical and computational aspects of geometric shape analysis	Hong Kong	2014
SIAM Conference on Computational Science and Engineering	Minisymposium	Efficient and adaptive computational methods for complex systems	Boston, MA, USA	2013
Approximation Theory 14	Minisymposium	Approximation of high-dimensional parameterized functions in uncertainty quantification	San Antonio, TX, USA	2013

Referee service

Panelist/reviewer for NSF, AFOSR, ISF, BIRS, HRB, NWO, ORAU, SIAM, Springer, and Wiley. Refereed ~170 submissions for the following publications:

ACOM	Advances in Computational Math
AML	Applied Mathematics Letters
AMC	Applied Mathematics and Computation
APNUM	Applied Numerical Mathematics
ACHA	Applied and Computational Harmonic Analysis
	Automatica
	Comptes Rendus Mathématique
COMMAT	Computational Materials Science
COAM	Computational and Applied Mathematics
CMM	Computational and Mathematical Methods
CMAME	Computer Methods in Applied Mechanics and Engineering
CAMWA	Computers and Mathematics with Applications
	Computing in Science and Engineering
CA	Constructive Approximation
DRNA	Dolomites Research Notes in Approximation Theory
M2AN	ESAIM: Mathematical Modeling and Numerical Analysis
IEEE TAC	IEEE Transactions on Automatic Control
IMAJNA	IMA Journal on Numerical Analysis
	Information and Inference: A Journal of the IMA
IJCM	International Journal of Computer Mathematics
IJUQ	International Journal of Uncertainty Quantification
	Inverse Problems
	Inverse Problems and Imaging
	Journal of Applied Mathematics
JCP	Journal of Computational Physics
JOCSCI	Journal of Computational Science
JCAM	Journal of Computational and Applied Mathematics
JMLMC	Journal of Machine Learning for Modeling and Computing
JMAA	Journal of Mathematical Analysis and Applications
JOMB	Journal of Mathematical Biology
JSC	Journal of Scientific Computing
MR	Mathematical Reviews

Referee service, continued

MMS	Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal
NMPDE	Numerical Methods for Partial Differential Equations
	Numerische Mathematik
PRIMUS	Problems, Resources, and Issues in Mathematics Undergraduate Studies
PRSA	Proceedings of the Royal Society A
SIIMS	SIAM Journal on Imaging Sciences
SINUM	SIAM Journal on Numerical Analysis
SISC	SIAM Journal on Scientific Computing
SIREV	SIAM Review
JUQ	SIAM/ASA Journal on Uncertainty Quantification
	Sampling Theory, Signal Processing, and Data Analysis
	Simulation Modeling Practice and Theory
SOFTX	Software X