

Guannan Zhang, Ph.D.

Research Staff

Computer Science and Mathematics Division

Oak Ridge National Laboratory

Oak Ridge, TN 37831-6211

Tel: (865) 241-4503, Fax: (865) 241-0381

Email: zhangg@ornl.gov

<http://www.csm.ornl.gov/~gz3>

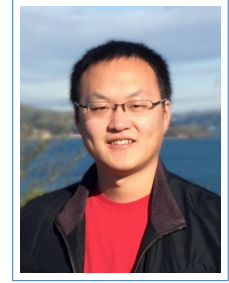
Assistant Professor (Joint Faculty)

Department of Mathematics and Statistics

Auburn University

Auburn, AL 36849

Email: gzz0005@auburn.edu



Education

2009 – 2012 **Ph.D. in Computational Science**, Florida State University, Tallahassee, Florida
Thesis advisor: Prof. Max D. Gunzburger

2009 – 2011 **M.S. in Computational Science**, Florida State University, Tallahassee, Florida
Thesis advisor: Prof. Max D. Gunzburger

2007 – 2009 **M.S. in Mathematics**, Shandong University, Jinan, Shandong, China
Thesis advisors: Prof. Weidong Zhao and Prof. Shige Peng

2003 – 2007 **B.S. in Mathematics**, Shandong University, Jinan, Shandong, China

Professional experience

2014 – **Research Staff**, Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee

2014 – **Assistant Professor (Joint Faculty)**, Department of Mathematics and Statistics, Auburn University, Auburn, Alabama

2012 – 2014 **Distinguished Staff Fellow (Householder Fellow)**, Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee

2009 – 2012 **Graduate Research Assistant**, Department of Scientific Computing, Florida State University, Tallahassee, Florida

2007 – 2009 **Graduate Research Assistant**, Department of Mathematics, Shandong University, Jinan, China

Research interests

High-dimensional function approximation

Uncertainty quantification and related applications

Scientific machine learning and artificial intelligence

Stochastic differential equations and stochastic optimization

Numerical solution of parameterized differential equations

Grants & constructs

Current funding support

- 2019 – 2021 **DOE - Advanced Scientific Computing Research**, *A Stochastic Optimal Control Framework For Quantifying And Reducing Uncertainties In Deep Learning*: \$800,000, Principal Investigator.
- 2018 – 2022 **DOE SciDAC - Fusion Energy Science & Advanced Scientific Computing Research**, *Simulation Center for Runaway Electron Avoidance and Mitigation (SCREAM2)*: \$600,000 for ORNL, Principal Investigator.
- 2018 – 2023 **ORNL - Laboratory Directed Research & Development**, *ORNL artificial intelligence initiative*: Senior Investigator.

Previous funding support

- 2016 – 2019 **NSF - Computational Mathematics**, *Mathematical methods for optimal polynomial recovery of high-dimensional systems from sparse and noisy data*: \$38,913, Principal Investigator.
- 2016 – 2018 **DOE SciDAC - Fusion Energy Science & Advanced Scientific Computing Research**, *Simulation Center for Runaway Electron Avoidance and Mitigation (SCREAM1)*: \$250,000 for ORNL's share, Principal Investigator.
- 2014 – 2018 **DOE – Advanced Scientific Computing Research**, *Accurate quantified mathematical methods for neutron science*: \$2,000,000 for ORNL, Senior Investigator.
- 2015 – 2017 **DOD - Defense Advanced Research Projects Agency (DARPA)**, *Foundations of rigorous mathematics for uncertainty quantification of large multiscale systems at the extreme scale*: \$1,500,000, Co-Principal Investigator.
- 2015 – 2017 **ORNL – Laboratory Directed Research & Development**, *Novel numerical methods for uncertainty quantification of multiscale materials*: \$700,000, Senior Investigator.
- 2013 – 2017 **DOE – Advanced Scientific Computing Research**, *Environment for quantifying uncertainty: integrated and optimized at the extreme-scale (EQUINOX)*: \$2,100,000 for ORNL, Senior Investigator.
- 2014 – 2017 **ORNL – Laboratory Directed Research & Development**, *Theory of neutron scattering in strongly correlated and disordered materials*: \$850,000 for ORNL, Senior Investigator.
- 2014 – 2015 **ORNL – Laboratory Directed Research & Development**, *A novel mathematical and computational paradigm for nonlinear filtering problems*: \$200,000 for ORNL, Principal Investigator.
- 2012 – 2014 **DOE – Advanced Scientific Computing Research**, **Householder Fellowship**: \$200,000 for ORNL, Principal Investigator.
- 2013 – 2014 **ORNL – Laboratory Directed Research & Development**, *A novel uncertainty quantification paradigm for enabling massively scalable predictions of complex stochastic simulations*: \$380,000 for ORNL, Senior Investigator.
- 2013 – 2014 **WFO: Procter & Gamble LLC**, *High-performance MCMC approximations for Bayesian nonparametric models of consumer behavior*: \$258,244 for ORNL, Senior Investigator.

Publications

Journal articles

1. J. Zhang, X. Liu, S. Bi, J. Yi, G. Zhang, M. Eisenbach, *Robust data-driven approach for predicting the configurational energy of high entropy alloys*, **Material & Design**, 185 (5), pp. 108247, 2020.
2. L. Mu and G. Zhang, *A domain-decomposition model reduction method for linear convection-diffusion equations with random coefficients*, **SIAM Journal on Scientific Computing**, 41 (3), pp. A1984-A2011, 2019.

3. X. Xie, G. Zhang and C. Webster, *Non-Intrusive Inference Reduced Order Model for Fluids Using Deep Multistep Neural Network*, **Mathematics**, 7(8), pp. 757, 2019
4. M. Gunzburger, M. Schneier, C. Webster, and G. Zhang, *An improved discrete least-squares reduced-basis method for parameterized elliptic PDEs*, **Journal of Scientific Computing**, 81 (1), pp. 76–91, 2019
5. P. Jantsch, C. Webster and G. Zhang, *On the Lebesgue constants of weighted Leja points for Lagrange interpolation on unbounded domains*, **IMA Journal on Numerical Analysis**, 39 (2), 1039–1057, 2019.
6. E. Hirvijoki, C. Liu, G. Zhang, D. del-Castillo-Negrete, and D. Brennan, *A fluid-kinetic framework for self-consistent runaway-electron simulations*, **Physics of Plasmas**, 25, pp. 062507, 2018.
7. J. Yang, G. Zhang and W. Zhao, *A first-order numerical scheme for forward-backward stochastic differential equations in bounded domains*, **Journal of Computational Mathematics**, 36, pp. 237–258, 2018.
8. S. Mo, D. Lu, X. Shi, G. Zhang, M. Ye, J. Wu and J. Wu, *A Taylor expansion-based adaptive design strategy for global surrogate modeling with applications in groundwater modeling*, **Water Resources Research**, 53, pp. 10802–10823, 2017.
9. H. Tran, C. Webster and G. Zhang, *Analysis of quasi-optimal polynomial approximations for parameterized PDEs with deterministic and stochastic coefficients*, **Numerische Mathematik**, 137, pp. 451–493, 2017.
10. G. Zhang, and D. del-Castillo-Negrete, *A backward Monte-Carlo method for time-dependent runaway electron simulations*, **Physics of Plasmas**, 24, pp. 092511, 2017.
11. W. Zhao, W. Zhang and G. Zhang, *Second-order numerical schemes for decoupled forward-backward stochastic differential equations with jumps*, **Journal of Computational Mathematics**, 35, pp. 213–244, 2017.
12. Q. Guan, M. Gunzburger, C. Webster and G. Zhang, *Reduced basis methods for nonlocal diffusion problems with random input data*, **Computer Methods in Applied Mechanics and Engineering**, 317, pp. 746–770, 2017.
13. M. Xi, D. Lu, D. Gui, Z. Qi and G. Zhang, *Calibration of an agricultural-hydrological model (RZWQM2) using surrogate global optimization*, **Journal of Hydrology**, 544, pp. 456–466, 2017.
14. D. Lu, G. Zhang, C. Webster and C. Barbier, *An improved multilevel Monte Carlo method for estimating probability distribution functions in stochastic oil reservoir simulations*, **Water Resources Research**, 52, pp. 9642–9660, 2016.
15. F. Bao, Y. Tang, M. Summers, G. Zhang, C. Webster, V. Scarola and T.A. Maier, *Efficient stochastic optimization for analytic continuation*, **Physical Review B**, 94, pp. 125149, 2016.
16. D. Galindo, P. Jantsch, C. Webster and G. Zhang, *Accelerating hierarchical stochastic collocation methods for partial differential equations with random input data*, **SIAM/ASA Journal on Uncertainty Quantification**, 4, pp. 1111–1137, 2016.
17. G. Zhang, C. Webster, M. Gunzburger and J. Burkardt, *Hyperspherical sparse approximation techniques for high-dimensional discontinuity detection*, **SIAM Review**, 58, pp. 517–551, 2016.
18. F. Bao, Y. Cao, C. Webster and G. Zhang, *An efficient meshfree implicit filter for nonlinear filtering problems*, **International Journal for Uncertainty Quantification**, 6, pp. 19–33, 2016.
19. G. Zhang, W. Zhao, M. Gunzburger and C. Webster, *Numerical methods for a class of nonlocal diffusion problems with the use of backward SDEs*, **Computers & Mathematics with Applications**, 71, pp. 2479–2496, 2016.
20. N. Dexter, C. Webster and G. Zhang, *Explicit cost bounds of stochastic Galerkin approximations for parameterized PDEs with random coefficients*, **Computers & Mathematics with Applications**, 71, pp. 2231–2256, 2016.

21. G. Zhang, C. Webster, M. Gunzburger and J. Burkardt, *A hyperspherical adaptive sparse-grid approach for high-dimensional discontinuity detection*, **SIAM Journal on Numerical Analysis**, 53, pp. 1508–1536, 2015.
22. V. Reshniak, A. Khaliq, D. Voss and G. Zhang, *Split-step Milstein methods for multi-channel stiff stochastic differential systems*, **Applied Numerical Mathematics**, 89, pp. 1–23, 2015.
23. F. Bao, Y. Cao, C. Webster and G. Zhang, *A hybrid sparse-grid approach for nonlinear filtering problems based on adaptive-domain of the Zakai equation approximation*, **SIAM/ASA Journal on Uncertainty Quantification**, 2, pp. 784–804, 2014.
24. M. Gunzburger, C. Webster and G. Zhang, *Stochastic finite element methods for partial differential equations with random input data*, **Acta Numerica**, 23, pp. 521–650, 2014.
25. C. Webster, G. Zhang and M. Gunzburger, *An adaptive sparse-grid-based iterative ensemble Kalman filter approach for parameter field estimation*, **International Journal on Computer Mathematics**, 91, pp. 798–817, 2014.
26. X. Zhang, C. Liu, B. Hu and G. Zhang, *Uncertainty analysis of multi-rate kinetics of uranium desorption from sediments*, **Journal of Contaminant Hydrology**, 156, pp. 1–15, 2014.
27. G. Zhang, D. Lu, M. Ye, M. Gunzburger and C. Webster, *An adaptive sparse-grid high-order stochastic collocation method for Bayesian inference in groundwater reactive transport modeling*, **Water Resources Research**, 49, pp. 6871–6892, 2013.
28. G. Zhang, M. Gunzburger and W. Zhao, *A sparse-grid method for multi-dimensional backward stochastic differential equations*, **Journal of Computational Mathematics**, 31, pp. 221–248, 2013.
29. G. Zhang and M. Gunzburger, *Error analysis of a stochastic collocation method for parabolic partial differential equations with random input data*, **SIAM Journal on Numerical Analysis**, 50, pp. 1922–1940, 2012.
30. W. Zhao, Y. Li and G. Zhang, *A generalized θ -scheme for solving backward stochastic differential equations*, **Discrete and Continuous Dynamical Systems – Series B**, 17, pp. 1585–1603, 2012.
31. W. Zhao, G. Zhang and L. Ju, *A stable multi-step scheme for solving backward stochastic differential equations*, **SIAM Journal on Numerical Analysis**, 48, pp. 1369–1394, 2010.

Journal articles (submitted & preprints)

32. M. Stoyanov and G. Zhang, *A multilevel reduced-basis method for parameterized partial differential equations*, **SIAM Journal on Scientific Computing**, submitted.
33. G. Zhang and D. del-Castillo-Negrete, *An improved backward Monte-Carlo method for runaway electron simulations with time-dependent electrical fields*, preprint.
34. G. Zhang and D. del-Castillo-Negrete, *A probabilistic adaptive semi-Lagrangian algorithm for the time-dependent anisotropic heat transport equation*, preprint.
35. M. Yang, G. Zhang and Y. Cao, *An efficient probabilistic scheme for quasi-linear nonlocal diffusion equations in three-dimensional irregular domains with applications in groundwater flow*, preprint.

Book Chapters

36. M. Yang, G. Zhang, D. del-Castillo-Negrete, M. Stoyanov, and M. Beidler, *A sparse-grid probabilistic scheme for approximation of the runaway probability of electrons in fusion tokamak simulation*, **Springer Lecture Notes on CS&E**, accepted.
37. H. Tran, C. Webster and G. Zhang, *A sparse grid method for Bayesian uncertainty quantification with application to large eddy simulation turbulence models*, **Springer Lecture Notes on CS&E**, 109, pp. 291–313, 2016.

38. M. Gunzburger, C. Webster and G. Zhang, *Sparse collocation methods for stochastic interpolation and quadrature*, **Handbook of Uncertainty Quantification**, pp. 1–46, Springer International Publishing, Switzerland, 2016.
39. M. Gunzburger, C. Webster and G. Zhang, *An adaptive wavelet stochastic collocation method for irregular solutions of PDEs with random input data*, **Springer Lecture Notes on CS&E**, 97, pp. 137–170, 2016.

Refereed Conference Papers

40. J. Zhang, H. Tran and G. Zhang, *Accelerating Reinforcement Learning with a Directional-Gaussian-Smoothing Evolution Strategy*, submitted (<https://arxiv.org/abs/2002.09077>).
41. J. Zhang, H. Tran, D. Lu and G. Zhang, *A scalable evolution strategy with directional Gaussian smoothing for blackbox optimization*, submitted (<https://arxiv.org/abs/2002.03001>).
42. G. Zhang, J. Zhang and J. Hinkle, *Learning nonlinear level sets for dimensionality reduction in function approximation*, **Advances in Neural Information Processing Systems (NeurIPS)**, 32, pp. 13199–13208, 2019.
43. G. Zhang, D. Lu, M. Ye, M. Gunzburger and C. Webster, *An efficient surrogate modeling approach in Bayesian uncertainty analysis*, **AIP Conference Proceedings**, 1558, pp. 898–901, 2013.

Conferences & presentations

Talks at conferences & workshops

- 2019 Workshop on control and optimization of nonlocal models, RICAM, Linz, Austria.
- 2019 Workshop on high-dimensional approximation, Zurich, Switzerland.
- 2019 International Congress on Industrial and Applied Mathematics, Valencia, Spain.
- 2019 CAIMS-SCMAI Annual Meeting 2019, Whistler, Canada.
- 2019 The International Conference on Mathematical Modeling and Numerical Methods, Qingdao, China.
- 2019 International Workshop on Approximation Theory, Nashville, TN.
- 2019 AMS Regional Conference, Auburn, AL.
- 2019 SIAM Conference on CS&E, Spokane, OR.
- 2018 The 5th Workshop on Sparse Grids and Applications, Munich, Germany
- 2018 SIAM Annual Meeting, Portland, OR
- 2018 International Symposium on Computational Harmonic Analysis, Beijing, China
- 2018 MATRIX: On the Frontiers of High Dimensional Computation, Melbourne, Australia
- 2018 BIRS: Numerical Analysis and Approximation: Theory meets Data Science, Banff, Canada
- 2018 SIAM Conference on Uncertainty Quantification, Garden Grove, CA
- 2018 Workshop on Surrogate models for UQ in complex systems, Newton Institute, Cambridge, UK
- 2017 59th Annual Meeting of the APS Division of Plasma Physics, Milwaukee, WI
- 2017 Opening workshop on SAMSI quasi-Monte Carlo program, Durham, NC
- 2017 SIAM Annual Meeting, Pittsburgh, PA
- 2017 International Sherwood Fusion Theory Conference, Annapolis, MD
- 2017 SIAM SEAS Annual Meeting (2 invited talks), Tallahassee, FL
- 2017 SIAM Conference on Computational Science and Engineering, Atlanta, GA

2017 The 10th International Conference on Computational Physics, Macao, China
 2016 58th Annual Meeting of the APS Division of Plasma Physics, San Jose, CA.
 2016 The 4th Workshop on Sparse Grids and Applications, Miami, FL
 2016 Uncertainty Quantification and High Performance Computing, Dagstuhl, Germany
 2016 The 15th International Conference on Approximation Theory, San Antonio, TX
 2016 SIAM Conference on Uncertainty Quantification, Lausanne, Switzerland
 2015 Workshop on Nonlocal Models in Mathematics, Science and Engineering, Oak Ridge, TN
 2015 Workshop on Advances in Scientific Computing and Applied Mathematics, Las Vegas, NV
 2015 AMS Central Fall Sectional Meeting, Chicago, IL
 2015 6th Workshop on High-Dimensional Approximation, Bonn, Germany
 2015 Workshop on Computational Mathematics and Scientific Computing, Jeju, Korea
 2015 The 8th International Congress on Industrial and Applied Mathematics, Beijing, China
 2015 13th US National Congress on Computational Mechanics, San Diego, CA
 2015 45th Annual John H. Barrett Memorial Lectures, University of Tennessee, Knoxville, TN
 2015 SIAM Conference on Computational Science and Engineering, Salt Lake City, UT
 2015 The 9th International Conference on Computational Physics, Singapore
 2014 47th American Geophysics Union Annual Fall Meeting, San Francisco, CA
 2014 3rd Workshop on Sparse Grid and Applications, Stuttgart, Germany
 2014 SIAM Annual Meeting, Chicago, IL
 2014 SIAM Conference on Uncertainty Quantification, Savannah, GA
 2014 SIAM SEAS Annual Meeting, Melbourne, FL
 2013 2nd International Conference on Engineering and Computational Mathematics, Hong Kong
 2013 11th International Conference of Numerical Analysis and Applied Mathematics, Rhodes, Greece
 2013 DOE Applied Mathematics Program PI Meeting, Albuquerque, NM
 2013 SIAM Annual Meeting, San Diego, CA
 2013 9th International Conference on Large-Scale Scientific Computations, Sozopol, Bulgaria
 2013 SIAM SEAS Annual Meeting, Knoxville, TN
 2013 SIAM Meeting on Computational Science and Engineering, Boston, MA
 2013 5th Workshop on High-Dimensional Approximation, Canberra, Australia
 2012 45th American Geophysics Union Annual Fall Meeting, San Francisco, CA
 2012 SIAM Meeting on Uncertainty Quantification (2 invited talks), Raleigh, NC
 2012 SAMSI Workshop on Nonlocal Continuum Models for Diffusion, Mechanics, and Other Applications, Research Triangle Park, NC
 2012 SAMSI Workshop on Uncertainty Quantification for HPC, Oak Ridge, TN
 2012 SIAM SEAS Annual Meeting, Huntsville, AL
 2011 3rd Annual JohnFest/SIAM Student Conference, Clemson, SC

Invited colloquia & seminars

2018 Department of Mathematics, Worcester Polytechnic Institute, Worcester, MA

- 2016 Vietnam Institute for Advanced Study in Mathematics, Hanoi, Vietnam
- 2016 Department of Mathematics, Shandong University, Jinan, China
- 2016 School of Earth Sciences and Engineering, Nanjing University, Nanjing, China
- 2014 Department of Mathematics and Statistics, Auburn University, Auburn, AL
- 2014 Department of Mathematics, University of Tennessee, Knoxville, TN
- 2014 School of Earth Sciences and Engineering, Nanjing University, Nanjing, China
- 2013 Department of Mathematics, Middle Tennessee State University, Murfreesboro, TN
- 2013 School of industrial and Systems Engineering, The Georgia Institute of Technology, Atlanta, GA
- 2013 Department of Mathematics, Auburn University, Auburn, AL
- 2012 Department of Mathematics, University of Tennessee, Knoxville, TN

Professional activities

Editorial Services

- 2017 **Co-editor: Springer Lecture Note on Computational Science and Engineering for Sparse Grids and Applications**, Co-organized with Jochen Garcke (University of Bonn), Dirk Pfluger (University of Stuttgart) and Clayton Webster (ORNL)

Conference & workshop organizing committees

- 2020 **Co-organizer: 44rd SIAM SEAS Annual Meeting**, Auburn, AL.
Workshop website: <http://webhome.auburn.edu/~jzl0097/SIAM-SEAS2020/index.htm>
- 2020 **Co-organizer: The 6th Workshop on sparse grids and applications**, Bonn, Germany.
Workshop website: <https://ins.uni-bonn.de/2020/sga>
- 2019 **Co-organizer: 43rd SIAM SEAS Annual Meeting**, Knoxville, TN.
Workshop website: <https://www.math.utk.edu/SIAM-SEAS/>
- 2016 **Co-organizer: The 4th Workshop on sparse grids and applications**, Miami, FL.
Workshop website: <http://www.csm.ornl.gov/workshops/SGA2016>
- 2016 **Co-organizer: The 5th Workshop on sparse grids and applications**, Munich, Germany.
Workshop website: <https://www5.in.tum.de/SGA2018/index.php>

Symposia organizer

- 2019 **SIAM Conference on Computational Science and Engineering**, Spokane, WA. *Theory and algorithms for improved performance of machine learning in scientific applications*, co-organized with Clayton Webster (ORNL).
- 2018 **The 13th World Congress in Computational Mechanics**, New York City, NY. *Recent Advances in Numerical Analysis and Algorithms for Uncertainty Quantification and its Applications*, co-organized with Miroslav Stoyanov (ORNL), Clayton Webster (ORNL).
- 2018 **SIAM Conference on Uncertainty Quantification**, Garden Grove, CA. *Advances in sparse polynomial approximations with applications to complex stochastic modeling*, co-organized with Hoang Tran (ORNL).
- 2016 **SIAM Conference on Uncertainty Quantification**, Lausanne, Switzerland. *Advances in statistical design and scalable polynomial approximation of stochastic systems*, co-organized with Eric Phipps (Sandia National Laboratories).

- 2015 **SIAM Conference on Analysis of Partial Differential Equations**, Scottsdale, AR. *Advances in theoretical and numerical analysis of parametrized PDEs in high dimension*, co-organized with Abdellah Chkifa (ORNL), Hoang Tran (ORNL) and Clayton Webster (ORNL).
- 2015 **The 8th International Congress on Industrial and Applied Mathematics**, Beijing, China. *Recent advances in stochastic approximation for uncertainty quantification: analysis and computation*, co-organized with Rich Archibald (ORNL) and Clayton Webster (ORNL).
- 2015 **SIAM Conference on Computational Science and Engineering**, Salt Lake City, UT. *High-dimensional approximation and integration: analysis and computation*, co-organized with Albert Cohen (Paris VI), Max Gunzburger (FSU) and Clayton Webster (ORNL).
- 2014 **SIAM Annual Meeting**, Chicago, IL. *Recent advances in uncertainty quantification at the extreme scale*, co-organized with Clayton Webster (ORNL).
- 2014 **SIAM Conference on Uncertainty Quantification**, Savannah, GA. *Efficient simulation of rare event*, co-organized with Xiang Zhou (Hong Kong CityU), Jianfeng Lu (Duke), Jingchen Liu (Columbia), and Rich Archibald (ORNL).
- 2014 **SIAM Conference on Uncertainty Quantification**, Savannah, GA. *Theoretical and numerical analysis for forward-backward stochastic differential equations and stochastic optimal control*, co-organized with Zhen Wu (SDU) and Weidong Zhao (SDU).
- 2014 **SIAM Conference on Uncertainty Quantification**, Savannah, GA. *Uncertainty quantification driven by large-scale applications*, co-organized with Clayton Webster (ORNL).
- 2014 **SIAM SEAS Annual Meeting**, Melbourne, FL. *Recent advances of numerical methods for uncertainty quantification with large-scale simulations*, co-organized with Miroslav Stoyanov (ORNL).
- 2013 **SIAM Annual Meeting**, San Diego, CA. *Recent advances in numerical methods for partial differential equations with random inputs*, co-organized with Miroslav Stoyanov (ORNL).
- 2013 **SIAM SEAS Annual Meeting**, Knoxville, TN. *Forward and inverse methods in uncertainty propagation and parameter calibration*, co-organized with Miroslav Stoyanov (ORNL).

Departmental & external service

- 2014 – **Member: Householder Fellowship search committee**, Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, TN
- 2017 – **Member: Division Science Council**, Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, TN

Technical referee

Journals: Computers and Mathematics with Applications, International Journal for Uncertainty Quantification, International Journal for Computer Mathematics, SIAM Journal on Numerical Analysis, SIAM/ASA Journal on Uncertainty Quantification, Water Resources Research, International Journal for Numerical Methods in Engineering, Discrete and Continuous Dynamical Systems - Series B, Communications in Computational Physics, Springer Lecture Notes on Computer Science & Engineering, Journal of Computational and Applied Mathematics, Applied Numerical Mathematics, IMA Journal on Numerical Analysis, Monthly Weather Review, Journal of Computational Physics;
Proposals: Department of Energy (DOE), Office of Science.

Membership

- 2009 – Society for Industrial and Applied Mathematics (SIAM)
- 2010 – American Geophysical Union (AGU)
- 2016 – American Physical Society (APS)

Teaching activity

Teaching assistant

- 2008 Teaching assistant: Calculus II (a class of ~ 60 students)
School of Mathematics, Shandong University, Jinan, China
- 2009 Teaching assistant: Advanced Calculus (a class of ~ 60 students)
School of Mathematics, Shandong University, Jinan, China

Short courses

- 2016 Uncertainty Quantification and Approximation Theory
Vietnam Institute for Advanced Study in Mathematics, Hanoi, Vietnam
- 2015 Introduction to partial differential equations with random inputs
School of Mathematics, Shandong University, Jinan, China

Supervising Ph.D. students

- 2015 – 2019 **Minglei Yang**, Department of Mathematics and Statistics, Auburn University, Auburn, Alabama

Supervising Ph.D. interns

- 2016 – 2017 **Jie Yang**, School of Mathematics, Shandong University, Jinan, China.
- 2019 **Sirui Bi**, Department of Mechanical Engineering, Johns Hopkins University.
- 2019 **Kan Zhang**, Department of Applied Mathematics, Illinois Institute of Technology.
- 2019 **Siyao Liu**, Department of Chemical and Petroleum Engineering, University of Kansas.

Computing experience & software

- Languages Well experienced and very proficient with ANSI C and C++, Fortran, Matlab, Python.
- Libraries Message Passing Interface (MPI), Portable Extensible Toolkit for Scientific Computation (PETSc), Linear Algebra PACKage (LAPACK), TASMANIAN - Toolkit for Adaptive Stochastic Modeling and Non-Intrusive Approximation, etc.
- Software development **TASMANIAN**: Toolkit for Adaptive Stochastic Modeling and Non-Intrusive Approximation, <https://tasmanian.ornl.gov>.