

Bao Wang

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Research

- General interests: deep learning and scientific computing.
- Specialization: Implicit neural networks, stochastic optimization and sampling, and computational biophysics and kirigami metamaterials.

Employment

- Assistant Professor. Department of Mathematics, University of Utah, 7/1/2020-present.
- Assistant Professor. Scientific Computing and Imaging Institute, University of Utah, 7/1/2020-present.
- PIC Assistant Adjunct Professor. Department of Mathematics, University of California, Los Angeles, 7/1/2018-06/30/2020.
- Assistant Adjunct Professor. Department of Mathematics, University of California, Los Angeles, 7/1/2016-6/30/2018.

Education

- Ph.D. Applied Mathematics, Michigan State University, USA, 2016.
- B.S. Mathematics, Suzhou University, China, 2012.

Awards

- Best Paper Award, The 7th International Conference on Machine Learning, Optimization, and Data Science, 2021.
- Chancellor's Award for Postdoctoral Research, University of California, 2020.

Grants

- NSF DMS-1924935, ATD: Collaborative Research: Robust, Accurate and Efficient Graph-Structured RNN for Spatio Temporal Forecasting and Anomaly Detection (2019-2022, PI, \$120,000).
- NSF DMS-1952339, FRG: Collaborative Research: Robust, Efficient, and Private Deep Learning Algorithms (2020-2023, co-PI, \$434,750).
- DOE DE-SC0021142, Trustworthy Physics-informed Deep Learning for Predictive Scientific Computing (2020-2023, co-PI, \$300,000).
- College of Science seed award, University of Utah (2021-2022, PI, \$17,500).
- NSF OAC-2219510, Student Support: 18th IEEE International Conference on eScience (2022-2022, PI, \$15,000).
- NSF DMS-2152762, CDS&E: Collaborative Research: Differential Equations Motivated Multi-Agent Sequential Deep Learning: Algorithms, Theory, and Validation (2022-2025, PI, \$100,000).
- NSF DMS-2208361, ATD: Fast Algorithms and Novel Continuous-depth Graph Neural Networks for Threat Detection (2023-2026, PI, \$125,000).
- NSF DMS-2219956, Collaborative Research: Algorithms, Theory, and Validation of Deep Graph Learning with Limited Supervision: A Continuous Perspective (2022-2025, PI, \$240,000).

- DOE DE-SC0023490, Reliable, Scalable, and Efficient Randomized Graph Neural Networks for Neural Combinatorial Optimization with Scientific Applications (2022-2025, PI, \$349,462).

Preprints

1. Shih-Hsin Wang*, Justin Baker*, Cory D. Hauck, Bao Wang, “Rethinking the Smoothness of Node Features Learned by Graph Convolutional Networks”, submitted.
2. Justin Baker, Yuhao Huang, Shih-Hsin Wang, Massimiliano Lupo Pasini, Bao Wang, “Stabilized E(n)-Equivariant Graph Neural Networks with Applications to Generative Models”, submitted.
3. Justin Baker, Hedi Xia, Yiwei Wang, Elena Cherkaev, Akil Narayan, Long Chen, Jack Xin, Andrea L. Bertozzi, Stanley J. Osher, and Bao Wang, “Proximal Implicit ODE Solvers for Accelerating Learning Neural ODEs”, *arXiv preprint*. [arXiv:2204.08621](https://arxiv.org/abs/2204.08621). (2022).
4. Tao Sun*, Huaming Ling*, Zuoqiang Shi, Dongsheng Li, and Bao Wang, “Training Deep Neural Networks with Adaptive Momentum Inspired by the Quadratic Optimization”, *arXiv preprint*. [arXiv:2110.09057](https://arxiv.org/abs/2110.09057). (2021).
5. Wenqi Tao*, Huaming Ling*, Zuoqiang Shi, and Bao Wang, “Deep Learning with Data Privacy via Residual Perturbation”. Submitted to *IEEE Transactions on Pattern Analysis and Machine Intelligence*, major revision.
6. Zhicong Liang, Bao Wang, Quanquan Gu, Stanley J. Osher, and Yuan Yao, “Exploring Private Federated Learning with Laplacian Smoothing”, *arXiv preprint*. [arXiv:2005.00218](https://arxiv.org/abs/2005.00218). (2020). Submitted to *Applied and Computational Harmonic Analysis*, minor revision.

Peer-Reviewed Conference Publications

7. Shih-Hsin Wang, Yung-Chang Hsu, Justin Baker, Andrea L. Bertozzi, Jack Xin, Bao Wang, “On Steerable Features of Different Types for 3D-Euclidean Equivariant Deep Learning”, *Proceeding of International Conference on Learning Representations (ICLR)*, 12, (2024).
8. Yuhao Huang, Qingsong Wang, Akwum Onwunta, Bao Wang, “Efficient Score Matching via Deep Equilibrium Layers”, *Proceeding of International Conference on Learning Representations (ICLR)*, 12, (2024).
9. Justin Baker, Qingsong Wang, Martin Berzins, Thomas Strohmer, Bao Wang, “Monotone Operator Theory-Inspired Message Passing for Learning Long-Range Interaction on Graphs”, AISTATS, (2024).
10. Justin Baker*, Qingsong Wang*, Cory Hauck, Bao Wang, “Implicit Graph Neural Networks: A Monotone Operator Viewpoint”, *Proceeding of International Conference on Machine Learning (ICML)*, 40, (2023).
11. Tao Sun*, Qingsong Wang*, Dongsheng Li, Bao Wang, “Momentum Ensures Convergence of SignSGD under Weaker Assumptions”, *Proceeding of International Conference on Machine Learning (ICML)*, 40, (2023).
12. Tao Sun, Dongsheng Li, and Bao Wang, “Finite-Time Analysis of Adaptive Temporal Difference Learning with Deep Neural Networks”, *Advances in Neural Information Processing Systems (NeurIPS)*, 36, (2022).

13. Tan Nguyen, Richard G. Baraniuk, Robert M. Kirby, Stanley J. Osher, and Bao Wang, “Momentum Transformer: Closing the Performance Gap Between Self-attention and Its Linearization”, *Proceeding of Mathematical and Scientific Machine Learning (MSML)*, 3, (2022).
14. Tao Sun, Dongsheng Li, and Bao Wang, “Adaptive Random Walk Gradient Descent for Decentralized Optimization”, *Proceeding of International Conference on Machine Learning (ICML)*, 39, (2022).
15. Matthew Thorpe*, Hedi Xia*, Tan Nguyen*, Thomas Strohmer, Andrea L. Bertozzi, Stanley J. Osher, and Bao Wang, “GRAND++: Graph Neural Diffusion with A Source Term”, *Proceeding of International Conference on Learning Representations (ICLR)*, 10, (2022).
16. Yunling Zheng, Carson Hu, Guang Lin, Meng Yue, Bao Wang, and Jack Xin, “GLASSOFormer: A Query-sparse Transformer for Post-Fault Power Grid Voltage Prediction”, *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, (2022).
17. Tan Nguyen, Vai Suliafu, Stanley J. Osher, Long Chen, and Bao Wang, “FMMformer: Efficient and Flexible Transformer via Decomposed Near-field and Far-field Attention”, *Advances in Neural Information Processing Systems (NeurIPS)*, 35, (2021).
18. Hedi Xia, Vai Suliafu, Hangjie Ji, Tan M. Nguyen, Andrea L. Bertozzi, Stanley J. Osher, Bao Wang, “Heavy Ball Neural Ordinary Differential Equations”, *Advances in Neural Information Processing Systems (NeurIPS)*, 35, (2021).
19. Zhijian Li, Bao Wang, Jack Xin, “An Integrated Approach to Produce Robust Deep Neural Network Models with High Efficiency”, *The 7th Int. Conf. on machine Learning, Optimization, and Data Science (LOD)*, (2021) (**Best paper award**).
20. Matthew Thorpe, Bao Wang, “Certifying Robustness of Graph Laplacian-Based Semi-Supervised Learning”, *Mathematical and Scientific Machine Learning Conference (MSML)*, 2, (2021).
21. Tao Sun, Dongsheng Li, Bao Wang, “Stability and Generalization of the Decentralized Stochastic Gradient Descent”, *Proceeding of AAAI Conference on Artificial Intelligence (AAAI)*, 35, (2021).
22. Tan M. Nguyen, Richard G. Baraniuk, Andrea L. Bertozzi, Stanley J. Osher, Bao Wang, “MomentumRNN: Integrating Momentum into Recurrent Neural Networks”, *Advances in Neural Information Processing Systems (NeurIPS)*, 34, (2020).
23. Bao Wang, Quanquan Gu, March Boedihardjo, Lingxiao Wang, Farzin Barekat, and Stanley J. Osher, “DP-LSSGD: A Stochastic Optimization Method to Lift the Utility in Privacy-Preserving ERM”, *Mathematical and Scientific Machine Learning Conference (MSML)*, 1, (2020).
24. Thu Dinh*, Bao Wang*, Andrea L. Bertozzi, Stanley J. Osher, Jack Xin, “Sparsity Meets Robustness: Channel Pruning for the Feynman-Kac Formalism Principled Robust Deep Neural Nets”, *Proceeding of Int. Conf. on machine Learning, Optimization, and Data Science (LOD)*, 6, (2020) (Oral).
25. Bao Wang, Zuoqiang Shi, and Stanley Osher, “ResNet Ensemble via the Feynman-Kac Formalism to Improve Both Natural and Robust Accurcies”, *Advances in Neural Information Processing Systems (NeurIPS)*, 33, 1657-1667 (2019).

26. Zhijian Li, Xiyang Luo, Bao Wang, Andrea L. Bertozzi, and Jack Xin, “A Study on Graph-Structured Recurrent Neural Networks and Sparsification with Application to Epidemic Forecasting”, *The 6th World Congress on Global Optimization (WCGO)*, 730-739, (2019).
27. Bao Wang, Xiyang Luo, Zhen Li, Wei Zhu, Zuoqiang Shi, and Stanley Osher, “Deep Neural Nets with Interpolating Function as Output Activation”, *Advances in Neural Information Processing Systems (NeurIPS)*, 32, 749-759 (2018).
28. Bao Wang*, Xiyang Luo*, Fangbo Zhang*, Baichuan Yuan, Andrea Bertozzi, and P. Jeffrey Brantingham, “Graph-based Deep Modeling and Real-time Forecasting of Sparse Spatio-temporal data”, *Workshop on Mining and Learning from Time Series (MileTS), KDD*, (2018).
29. Bao Wang, Duo Zhang, Duanhao Zhang, P. Jeffrey Brantingham, and Andrea Bertozzi, “Deep Learning for Real-time Crime Forecasting”, *2017 International Symposium on Nonlinear Theory and Its Applications (NOLTA)*, Cancun, Mexico, December 4-7, 330-333, (2017). (Best Paper Award–Final List)

Referred Journal Publications

30. Tao Sun, Qingsong Wang, Yunwen Lei, Dongsheng Li, and Bao Wang, “Pairwise Learning with Provably Convergent Adaptive Online Gradient Descent”. *Transactions on Machine Learning Research*, Accepted.
31. Wes Whiting, Bao Wang, Jack Xin, “Convergence of Hyperbolic Neural Networks under Riemannian Stochastic Gradient Descent”, *Communications on Applied Mathematics and Computation*, Accepted.
32. Justin Baker, Elena Cherkaev, Akil Narayan, and Bao Wang, “Learning POD of Complex Dynamics Using Heavy-ball Neural ODEs”, *Journal of Scientific Computing*, 95(2), 54, (2023).
33. Mengqi Hu, Yifei Lou, Bao Wang, Ming Yan, Xiu Yang, Qiang Ye, “Accelerated Sparse Recovery via Gradient Descent with Nonlinear Conjugate Gradient Momentum”, *Journal of Scientific Computing*, 95:33, (2023).
34. Bao Wang, Qiang Ye, “Improving Deep Neural Networks Training for Image Classification with Nonlinear Conjugate Gradient-style Adaptive Momentum”, *IEEE Transactions on Neural Networks and Learning Systems*, Accepted. doi:10.1109/TNNLS.2023.3255783.
35. Tao Sun, Dongsheng Li, Bao Wang, “On the Decentralized Stochastic Gradient Descent with Markov Chain Sampling”, *IEEE Transactions on Signal Processing*, Accepted. doi:10.1109/TSP.2023.3297053.
36. Zhemin Li, Tao Sun, Hongxia Wang, and Bao Wang, “Adaptive and Implicit Regularization Neural Network for Matrix Completion”, *SIAM Journal on Imaging Sciences*, 15 (4), 2000-2022, (2022).
37. Tao Sun, Dongsheng Li, and Bao Wang, “Decentralized Federated Averaging”, *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, 45 (4), 4289-4301, (2022).
38. Yifan Hua*, Kevin Miller*, Andrea L Bertozzi, Chen Qian, Bao Wang, “Efficient and Reliable Overlay Networks for Decentralized Federated Learning”, *SIAM Journal on Applied Mathematics*, 82 (4), 1558-1586. (2022).

39. Lisa Maria Kreusser, Stanley J. Osher, and Bao Wang, “A Deterministic Approach to Avoid Saddle Points”, *European Journal of Applied Mathematics*, 34 (4), 738-757, (2023).
40. Bao Wang, Hedi Xia, Tan Nguyen, Stanley Osher, “How Does Momentum Benefit Deep Neural Networks Architecture Design? A Few Case Studies”, *Research in the Mathematical Sciences*, 9 (3), 1-37. (2022).
41. Stanley Osher, Bao Wang, Penghang Yin, Xiyang Luo, Minh Pham, and Alex Lin, “Laplacian Smoothing Gradient Descent”, *Research in the Mathematical Sciences*, 9 (3), 1-26. (2022).
42. Bao Wang, Tan M. Nguyen, Andrea L. Bertozzi, Richard Baraniuk, Stanley J. Osher, ”Scheduled Restart Momentum for Accelerated Stochastic Gradient”, *SIAM Journal on Imaging Sciences*, 15 (2), 738-761. (2022).
43. Ti Bai, Biling Wang, Dan Nguyen, Bao Wang, Bin Dong, Wenxiang Cong, Mannudeep Kalra, and Steve Jiang, “Deep Interactive Denoiser (DID) for X-Ray Computed Tomography”, *IEEE Transactions on Medical Imaging*, 40 (11), 2965-2975, (2021).
44. Zuoqiang Shi, and Bao Wang, “Error estimation of weighted nonlocal Laplacian on random point cloud”, *Journal of Computational Mathematics*, 39 (6), 865. (2021).
45. Bao Wang, and Stanley J. Osher, “Graph Interpolating Activation Improves Both Natural and Robust Accuracies in Data-Efficient Deep Learning”, *European Journal of Applied Mathematics*, 32 (3), 540-569. (2021).
46. Bao Wang*, Difan Zou*, Quanquan Gu, and Stanley J. Osher, ”Laplacian Smoothing Stochastic Gradient Markov Chain Monte Carlo”, *SIAM Journal on Scientific Computing*, 43 (1), A26-A53. (2021).
47. Chueh-Yu Wu, Bao Wang, Joseph de Rutte, Alexis Joo, Matthew Jacobs, Kyung Ha, Andrea Bertozzi, and Dino Di Carlo, “Monodisperse Emulsions Templated by 3D-structured Microparticles”, *Science Advances*, 6 (45), eabb9023. (2020).
48. Bao Wang, Binjie Yuan, Zuoqiang Shi, and Stanley J. Osher, “EnResNet: ResNets Ensemble via the Feynman–Kac Formalism for Adversarial Defense and Beyond”, *SIAM Journal on Mathematics of Data Science*, 2(3), 559-582, (2020).
49. Bao Wang, Alex Lin, Wei Zhu, Penghang Yin, Andrea Bertozzi, and Stanley Osher, “Adversarial Defense via Data-dependent Activation Function and Total Variation Minimization”, *Inverse Problems and Imaging*, doi:10.3934/ipi.2020046 (2020).
50. Wei Zhu, Qiang Qiu, Bao Wang, Jianfeng Lu, Guillermo Sapiro, and Ingrid Daubechies, “Stop Memorizing: A Data-dependent Regularization Framework for Intrinsic Pattern Learning”, *SIAM Journal on Mathematics of Data Science*, 3, 476-496, (2019).
51. Bao Wang, Penghang Yin, Andrea Bertozzi, P. Jeffrey Brantingham, Stanley Osher, and Jack Xin, “Deep Learning for Real-Time Crime Forecasting and its Ternarization”, *Chinese Annals of Mathematics, Series B*, 40(6), 949-966, (2019).
52. Wei Zhu, Bao Wang, Richard Barnard, Cory Hauck, Frank Jenko, Stanley Osher, “Scientific Data Interpolation with Low Dimensional Manifold Model”, *Journal of Computational Physics*, 352,

213-245 (2018).

53. Bao Wang, Chengzhang Wang, Kedi Wu and Guowei Wei, “Breaking the Polar-nonpolar Division in Solvation Free Energy Prediction”, *Journal of Computational Chemistry*, 39, 217–232 (2018).

54. Yin Cao, Bao Wang, Kelin Xia and Guowei Wei, “Finite Volume Formulation of the MIB Method for Elliptic Interface Problems”, *Journal of Computational and Applied Mathematics*, 321, 60-77 (2017).

55. Bao Wang, Zhixiong Zhao, and Guowei Wei, “Feature Functional Theory - Binding Predictor (FFT-BP) for the Blind Prediction of Binding Free Energy”, *Theoretical Chemistry Account*, 136, 55 (2017).

56. Bao Wang and Guowei Wei, “Accurate, Robust and Reliable Calculations of Poisson-Boltzmann Binding Energies”, *Journal of Computational Chemistry*, 38, 941-948 (2017).

57. Beibei Liu, Bao Wang, Rundong Zhao, Yiyong Tong and Guowei Wei, “ESES: Software for Eulerian Solvent Excluded Surface”, *Journal of Computational Chemistry*, 38, 446-466 (2017).

58. Bao Wang, Zhixiong Zhao and Guowei Wei, “Automatic Parametrization of Non-polar Implicit Solvent Models for the Blind Prediction of Solvation Free Energies”, *Journal of Chemical Physics*, 145, 124110 (2016).

59. Bao Wang and Guowei Wei, “Objective-oriented Persistent Homology”, *Journal of Computational Physics*, 305, 276-299 (2016).

60. Bao Wang and Guowei Wei, “Parameter Optimization in Differential Geometry based Solvation Models”, *Journal of Chemical Physics*, 143, 134119 (2015).

61. Bao Wang, Kelin Xia and Guowei Wei, “Second-order Method for Solving 3D Elasticity Equations with Complex Interfaces”, *Journal of Computational Physics*, 294, 405-438 (2015).

62. Bao Wang, Kelin Xia and Guowei Wei, “Matched Interface and Boundary Method for Irregular Elastic Interface Problems”, *Journal of Computational and Applied Mathematics*, 285, 203-225 (2015).

Patent

Monodisperse Emulsions Templated by Three-dimensional Structured Microparticles and Methods of Making the Same, US Patent No. US-2022-0233413-A1, issued 07/28/2022, with Dino Di Carlo, Chueh-Yu Wu, Andrea L. Bertozzi, Joseph de Rutte and Kyung Ha.

Mentoring

- REU, Summer 2017, Project: Deep Learning for Body Worn Video Object Detection.
- RIPS, Summer 2019, Project: Quantifying Privacy Leakage in Google’s Ads Data Hub.
- Undergraduate Students:
 - Charles Halberg (Utah, 2022-)
 - Duo Zhang (UCLA, 2016-2017)
 - Duanhao Zhang (UCLA, 2016-2017)

- Graduate Students:
 - Shih-Hsin Wang (Utah, Ph.D. in mathematics, co-advise with Tommaso de Fernex, 2022-)
 - Taos Transue (Utah, Ph.D. in applied math, 2022-)
 - Yuhao Huang (Utah, Ph.D. in applied math, 2022-)
 - Justin Baker (Utah, Ph.D. in applied math, co-advise with Elena Cherkaev, 2021-)
 - Eric Brown (Utah, MS. in applied math, 2020-2021)
 - Michael Northrup (Utah, MS, in statistics, 2020-2022)
- Visiting students:
 - Siwakon Suppalap (Naresuan University, Thailand, 2022-)
 - Tan M. Nguyen (UCLA, 2020-2021)
- Postdoc:
 - Qingsong Wang (Ph.D. in mathematics from Ohio State University, 2022-).

Committee Service

- Ph.D. thesis committee for: Delaney Mosier at the University of Utah, Hedi Xia at UCLA.
- Colloquium committee (Department of Mathematics, Utah): 2020-2022.
- Department development committee (Department of Mathematics, Utah): 2020-2022.
- Hiring committee for Extreme Data Management Analysis and Visualization at the Scientific Computing and Imaging (SCI) Institute, 2021.

Synergistic Activities

- Co-organizer (with Andrea Bertozzi, Gitta Kutyniok, Stanley Osher, Jack Xin), Efficient and Reliable Deep Learning Methods and their Scientific Applications, Banff International Research Station (Alberta, Canada), June, 2025.
- Student program chair, 18th IEEE International Conference on eScience, October 2022.
- Co-organizer (with Anima Anandkumar, Richard G. Baraniuk, Animesh Garg, Stanley Osher, and Tan M. Nguyen), ICLR Workshop on Integration of Deep Neural Models and Differential Equations, April 2020.
- Designing a new course: Math 5750/6880: Mathematics of Data Science — for senior undergraduate and graduate students.

Course Taught

- Math 3150, Partial Differential Equations for Engineering Students, U of Utah, Spring 2022.
- Math 5750/6880, Mathematics of Data Science, U of Utah, Fall 2021, Fall 2022, Fall 2023.
- Math 2270, Linear Algebra, Utah, Fall 2020, U of Utah, Spring 2021.
- PIC 10B, Programming in C++-II, UCLA, Winter 2019, Winter 2020.
- PIC 10A, Programming in C++-I, UCLA, Fall 2018, Fall 2019, Winter 2020, Spring 2020.
- Math 142, Math modeling, Lecture, UCLA, Winter 2018.
- Math 151B, Applied numerical method-II, Lecture, UCLA, Spring 2017, Spring 2018.
- Math 151A, Applied numerical method-I, Lecture, UCLA, Fall 2016, Winter 2017.
- Math 133, Single-variable calculus, Lecture, MSU, Fall 2015.

- Math 234, Multi-variable calculus, Lecture, MSU, Summer 2014.

Invited Talks

Applied Mathematics and MMICCs Principal Investigator Meeting, Albuquerque, NM, January 8-9, 2024.

Computational and Applied Mathematics Colloquium, Penn State University, College Station, PA, November 6, 2023.

ISE Seminar Series, Lehigh University, Bethlehem, PA, September 16, 2023.

Mathematics and computer science LANS seminars, Argonne National Laboratory, Lemont, IL, September 6, 2023.

CBMS Conference: Deep Learning and Numerical PDEs, Morgan State University, Baltimore, MD, June 19-24, 2023.

Inaugural CAMDA Conference, Texas A&M, College Station, May 22 - 25, 2023.

Applied Math Seminar, Center for Mathematical Sciences, at Huazhong University of Science and Technology and Great Bay University, Online, March 30, 2023.

Seminar on Mathematical Data Science between Penn State, Purdue, and the University of Maryland, Online, February 6, 2023.

Data Science Seminar, University of Tennessee, TN, November 17, 2022.

Numerical Analysis Seminar, North Carolina State University, NC, October 18, 2022.

International Multigrid Conference 2022, Multigrid and Multilayer Methods, Lugano, Switzerland, August 22-26, 2022.

Applied and Computational Mathematics Seminar, Georgia Tech, March 28, 2022

SIAM Conferences on Imaging Sciences, March 23, 2022

Mathematics in Imaging, Data and Optimization, Rensselaer Polytechnic Institute, March 16, 2022

e-Seminar on Scientific Machine Learning, March, 4, 2022

Applied Math Seminar, LANL, March 3, 2022

Applied Math Seminar, City University of Hongkong, Shenzhen, February 24, 2022

Applied Math Seminar, UCLA, February 22, 2022

Multiscale seminar, Illinois Institute of Technology, December 16, 2021

MURI annual meeting, virtual, October, 07, 2021.

The 2021 ICSA Applied Statistics Symposium, virtual, September 12, 2021.

One world seminar on the mathematics of machine learning, virtual, July 14, 2021.

Mathematics in Computation (MiC) Talk Series, Oak Ridge National Laboratory, virtual, July 8, 2021.

Recent Advances in Machine Learning and Optimization, SIAM CSE, virtual, March 4, 2021.

Applied Math/Inverse Problem Seminar, Colorado State University, October, 7, 2020.

Applied and Computational Math Seminar, Tsinghua University, Beijing, August 6, 2020.

Optimal Control in Data Science and Mini-symposium, SIAM MDS, virtual, June 17, 2020.

Seminar on Data Science and Applied Mathematics, The Hongkong University of Science and Technology, HongKong, May 7, 2020.

The MDL collective, Iowa State University, Ames IA, May 1, 2020.

CCMA Seminar on Mathematics of Data and Computation, Penn State University, State College PA, April 24, 2020.

Data Science Seminar, Institute of Natural Science, Shanghai Jiaotong University, Shanghai, April 23, 2020.

Applied Math Seminar, Department of Mathematics, The University of Utah, Salt Lake City UT, February 21, 2020.

Colloquium, Department of Mathematics, The University of Utah, Salt Lake City UT, February 20, 2020.

Colloquium, Department of Mathematics, University of California, Merced, Merced CA, February 11, 2020.

Colloquium, Department of Mathematics, University of California, Santa Barbara, Santa Barbara CA, February 6, 2020.

Colloquium, Department of Mathematics, Washington State University, Pullman WA, February 3, 2020.

Colloquium, Department of Mathematics, The University of Texas at Dallas, Dallas TX, January 31, 2020.

Colloquium, Department of Mathematics, The University of Arizona, Tucson AZ, January 27, 2020.

Colloquium, Department of Mathematics, Emory University, Atlanta GA, January 23, 2020.

Colloquium, Department of Mathematics, University of Kentucky, Lexington KY, January 21, 2020.

Colloquium, Department of Mathematics, University of North Carolina at Chapel Hill, Chapel Hill NC, January 16, 2020.

Colloquium, Department of Mathematics, University of California, Davis, Davis CA, January 10, 2020.

Colloquium, Department of Mathematics, University of Massachusetts Amherst, Amherst MA, December 18, 2019.

Colloquium, Department of Mathematics, University of South Carolina, Columbia SC, December 13, 2019.

Colloquium, Department of Mathematics, The University of Texas at Arlington, Arlington TX, November 25, 2019.

Algorithms for Threat Detection Kickoff Workshop. D.C., October 21-23, 2019.

Applied Math Seminar. UCLA. October 16, 2019.

Computer Science Seminar. Indiana University - Purdue University Indianapolis. Indianapolis, August 30-31, 2019.

STROBE Annual Meeting. University of Colorado Boulder. Boulder, June 12-14, 2019.

Recent Developments on Mathematical/Statistical approaches in Data Sciences (MSDAS). University of Texas at Dallas. Dallas, June 1-June 2, 2019.

NSF-CBMS Conference: Mathematical Molecular Bioscience and Biophysics. University of Alabama. Tuscaloosa, May 13 - May 17, 2019.

SIAM Conference on Computational Science and Engineering (CSE19). Spokane, February 25-March 1, 2019.

Simons MATH + X Symposium. Rice University. Huston, January 23-25, 2019.

STROBE Annual Meeting. University of Colorado Boulder. Boulder, September 24-25, 2018.

Applied and Computational Math Seminar. UC Irvine. Irvine, May 14, 2018.

STROBE seminar series. UCLA. Los Angeles, May 02, 2018.

Applied Math Seminar. UC Berkeley. Berkeley, February 21, 2018.

Algorithms for Threat Detection Kickoff Workshop. D.C., September 14-15, 2017.

The Level Set Collective. UCLA. Los Angeles, Jan 30, 2018; May 08, 2018; December 18, 2018; April 30, 2019.

Journal and Conference Reviewer

Conference Reviewer for

- European Conference on Computer Vision (ECCV), 2018

- International Conference on Learning Representations (ICLR), 2018, 2019, 2020, 2021, 2022
- International Conference on Machine Learning (ICML), 2021, 2022
- Conference on Neural Information Processing Systems (NeurIPS), 2020, 2021, 2022, 2023

Program Committee Member for

- The 22nd IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing

Journal Reviewer for

- Applied and Computational Harmonic Analysis
- Communication in Mathematical Sciences
- Computers & Mathematics with Applications
- Computer Methods in Applied Mechanics and Engineering
- CSIAM Transactions on Applied Mathematics
- The European Heart Journal
- Journal of Computer Science and Technology
- Journal of Scientific Computing
- Journal of Computational Physics
- IEEE Transactions on Computational Social Systems
- IEEE Transactions on Signal Processing
- Journal of Computational Physics
- Physics Review Fluids
- Physics Review E
- Proceedings of the National Academy of Sciences
- Neural Computation
- Neurocomputing
- SIAM Journal on Applied Dynamical Systems
- SIAM Journal on Mathematics of Data Science