Hanqi Guo

CONTACT

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Dr. Hanqi Guo is a computer scientist specializing in visualization, analysis, and machine learning for scientific data. He is an awardee of the U.S. Department of Energy Early Career Research Program in 2022. He has received the best paper awards in IEEE VIS, IEEE PacificVis, and IEEE IPDPS, premier conferences in the visualization and HPC research communities.

APPOINTMENTS

Department of Computer Science and Engineering, The Ohio State University, Columbus, OH
- **Associate Professor** **August 2022–present**

Mathematics and Computer Science Division, Argonne National Laboratory, Lemont, IL
- **Computer Scientist** (0% Joint Appointment) **September 2022–present**
- Computer Scientist October 2021–August 2022
- Assistant Computer Scientist August 2017–September 2021
- Postdoctoral Appointee August 2014–August 2017

Northwestern University Argonne National Laboratory Institute for Science and Engineering (NAISE), Northwestern University, Evanston, IL
- Fellow September 2017–August 2022

University of Chicago Consortium for Advanced Science and Engineering (CASE), The University of Chicago, Chicago, IL
- Scientist August 2019–August 2022

EDUCATION

Ph.D. in Computer Science September 2009–July 2014
Peking University, Beijing, China

B.S. in Mathematics and Applied Mathematics September 2005–June 2009
Beijing University of Posts and Telecommunications, Beijing, China

HONOURS AND AWARDS (SELECTED)

- Best Paper Award, IEEE Workshop on Large Data Analysis and Visualization (LDAV), Vienna, Austria **2025**
- Best Paper Award, International Parallel and Distributed Processing Symposium (IPDPS), Milan, Italy **2025**
- Awardee, DOE Early Career Research Program (ECRP) **2022**
- Best Paper Honorable Mention Award, IEEE VIS 2022, Oklahoma City, OK **2022**
- Best Short Paper Honorable Mention Award, IEEE VIS 2021 **2021**
- Best Paper Award, IEEE PacificVis 2021 **2021**
- Best Paper Award, IEEE VIS 2019, Vancouver, BC, Canada **2019**
- Best Paper Honorable Mention Award, IEEE Symposium on Large Data Analysis and Visualization (LDAV), Berlin, Germany **2018**
- Outstanding Postdoctoral Performance Award in Basic Research, Argonne National Laboratory, Lemont, IL **2017**
- Best Paper Honorable Mention Award, SIGGRAPH Asia 2017 Symposium on Visualization, Bangkok, Thailand **2017**
- Best Paper Award, China Visualization and Visual Analytics Conference (ChinaVis), Changsha, China **2016**
- Best Poster Honorable Mention Award, IEEE VIS 2014, Paris, France **2014**

GRANTS

- [**DOE/SciDAC/BES**] Site-PI, "Foundation Models Orchestrating Reasoning Agents to Uncover Materials Advances and Insights (FORUM-AI)." Award Amount: $800K, Award Period: 9/1/2025–8/31/2030, Location: The Ohio State University, Lead-PI: Anubhav Jain (Lawrence Berkely National Laboratory)
- [**DOE/ASCR**] Site-PI, "A novel framework to design trustworthy lossy compressors for scientific data approaching lossy compressibility limits." Award Amount: $450K, Award Period:

12/1/2024–11/30/2027, Location: The Ohio State University

- [**DOE/ECRP**] Sole PI, "Multidimensional Parameter-Space Feature Tracking, Analysis, and Visualization." Source: DOE Office of Science. Award Amount: $750K, Award Period: 8/15/2022–8/14/2027, Location: The Ohio State University
- [**NSF/CISE/CSSI**] Site-PI, "Collaborative Research: Frameworks: FZ: A fine-tunable cyberinfrastructure framework to streamline specialized lossy compression development." Source: National Science Foundation, Award Number: 2311878, Award Amount: $679,853, Award Period: 8/1/2023–7/31/2027, Location: The Ohio State University
- [**NSF/CISE/OAC**] Site-PI, "Collaborative Research: OAC Core: Topology-Aware Data Compression for Scientific Analysis and Visualization." Source: National Science Foundation, Award Number: 2313123, Award Amount: $199,989, Award Period: 9/1/2023–8/31/2027, Location: The Ohio State University
- [**DOE/ASCR**] Site-PI, "Actionable Intelligent Visual Analytics of Ensembles." Source: DOE Office of Science. Award Amount: $2.7M, Award Period: 9/15/2022–9/14/2025, Location: The Ohio State University, Lead-PI: Kristi Potter (National Renewable Energy Laboratory)
- [**DOE/ASCR**] Site-PI (Subaward), "Implicit Continuous Representations for Visualization of Complex Data." Source: DOE Office of Science. Award Amount: $2.7M, Award Period: 9/15/2022–9/14/2025, Location: The Ohio State University, Lead-PI: Tom Peterka (Argonne National Laboratory)
- [**DOE/SciDAC/BER**] Senior Researcher, "Improving Projections of AMOC and its Collapse Through Advanced Simulations (ImPACTS)." Award Amount: $7.5M, Award Period: 8/15/2022–8/14/2027, Location: The Ohio State University, Lead-PI: Luke Van Roekel (Los Alamos National Laboratory).
- [**DOE/SciDAC/NP**] Senior Researcher, "Femtoscale Imaging of Nuclei using Exascale Platforms." Award Amount: $9M, Award Period: 8/15/2022–8/14/2027, Location: Argonne National Laboratory, Lead-PI: Ian Clöet (Argonne National Laboratory). `https://www.anl.gov/phy/quantom`
- [**NSF/CISE/III**] PI, "Collaborative Research: III: Medium: Deep Learning for In Situ Analysis and Visualization." Source: National Science Foundation, Award Amount: $1.2M, Award Period: 6/1/2020–5/31/2023, Location: The Ohio State University. `https://sites.google.com/view/dl4vis`
- [**DOE/NP**] Co-PI, "Modern Data Analytics for the Large Gamma-Ray Spectrometers." Source: DOE Nucear Physics Program. Award Amount: $1M, Award Period: 10/1/2021–9/30/2023, Location: Argonne National Laboratory, Lead-PI: Michael Carpenter (Argonne National Laboratory)
- [**ANL/LDRD**] Sole PI, "Scaling Visualization Surrogate Models with Wafer-Scale Deep Learning Accelerator." Source: Argonne Laboratory Directed Research and Development, Award Amount: $50K, Award Period: 5/1/2021–9/30/2021, Location: Argonne National Laboratory
- [**DOE/SciDAC**] Senior Researcher, "A SciDAC Institute for Computer Science and Data." Source: DOE Advanced Scientific Computing Research Program, Award Amount: $4,059,000, Award Period: 09/27/2017–9/26/2020, Location: Argonne National Laboratory, Lead-PI: Rob Ross (Argonne National Laboratory)
- [**DOE/ECP**] Senior Researcher, "CODAR: A Co-design Center for Online Data Analysis and Reduction at the Exascale." Source: DOE Exascale Computing Project, Award Amount: $6,851,938, Location: Argonne National Laboratory, Lead-PI: Ian Foster (Argonne National Laboratory)
- [**DOE/SciDAC/BER**] Senior Researcher, "Coupling Approaches for Next-Generation Architectures." Source: DOE Advanced Scientific Computing Research Program, Award Amount: $1,637,100, Award Period: 7/19/2017–7/18/2022, Location: Los Alamos National Laboratory, Lead-PI: Phil Jones (Los Alamos National Laboratory)
- [**ANL/LDRD**] Sole PI, "FTK: The Feature Tracking Kit." Source: Argonne LDRD Innovate Program, Award Amount: $55K/yr, Award Period: 10/1/2018–9/30/2019, Location: Argonne National Laboratory. `https://github.com/hguo/ftk`
- [**ANL/LDRD**] Sole PI, "Neuromorphic Computing for Feature Extracting and Tracking." Source: Argonne Argonne Laboratory Directed Research and Development, Award Amount: $37.5K, Award Period: 5/30/2019–9/30/2019, Location: Argonne National Laboratory

REFEREED JOURNAL PAPERS (with mentored students/postdoc underlined)

1. [**TVCG**] Nathaniel Gorski, Xin Liang, **Hanqi Guo**, Bei Wang, "TFZ: Topology-Preserving Compression of 2D Symmetric and Asymmetric Second-Order Tensor Fields." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE VIS 2024)*, 2026. (In Preprint)

2. [**CGF**] <u>Congrong Ren</u>, Randy Michael Churchill, Albert Mollén, Robert Hager, Seung-Hoe Ku, Choong-Seock Chang, and **Hanqi Guo**, "Fast and Invertible Simplicial Approximation of Magnetic-Following Interpolation for Visualizing Fusion Plasma Simulation Data." *Computer Graphics Forum (Proc. EuroVis 2025)*, 44(3), Article e70120, 2025.

3. [**TVCG**] <u>Yuxiao Li</u>, Xin Liang, Bei Wang, <u>Yongfeng Qiu</u>, Lin Yan, and **Hanqi Guo**, "MSz: An Efficient Parallel Algorithm for Correcting Morse-Smale Segmentations in Error-Bounded Lossy Compressors." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE VIS 2024)*, 31(1):130–140, 2025.

4. [**TVCG**] Tianyu Xiong, Skylar Wurster, **Hanqi Guo**, Tom Peterka, and Han-Wei Shen, "Regularized Multi-Decoder Ensemble for an Error-Aware Scene Representation Network." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE VIS 2024)*, 31(1):645–655, 2025.

5. [**TVCG**] Nathaniel Gorski, Xin Liang, **Hanqi Guo**, Lin Yan, and Bei Wang, "A General Framework for Augmenting Lossy Compressors with Topological Guarantees." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE PacificVis 2025 Journal Track)*, 31(6):3693–3705, 2025.

6. [**CSUR**] Sheng Di, Jinyang, Liu, Kai Zhao, Xin Liang, Robert Underwood, Zhaorui Zhang, Milan Shah, Yafan Huang, Jiajun Huang, Xiaodong Yu, <u>Congrong Ren</u>, **Hanqi Guo**, Grant Wilkins, Dingwen Tao, Jiannan Tian, Sian Jin, Zizhe Jian, <u>Daoce Wang</u>, Md Hasanur Rahman, Boyuan Zhang, Shihui Song, Jon C. Calhoun, Guanpeng Li, Kazutomo Yoshii, Khalid Ayed Alharthi, and Franck Cappello, "A Survey on Error-bounded Lossy Compression for Scientific Datasets." *ACM Computing Surveys*, 57(11), Article 287, pp.1–38 2025. (Accepted)

7. [**CGF**] <u>Congrong Ren</u>, Xin Liang, and **Hanqi Guo**, "A Prediction-Traversal Approach for Compressing Scientific Data on Unstructured Meshes with Bounded Error." *Computer Graphics Forum (Proc. EuroVis 2024)*, 43(3):e15097, 2024.

8. [**CGF**] <u>Fangfei Lan</u>, Brandi Gamelin, Lin Yan, Jiali Wang, Bei Wang, and **Hanqi Guo**, "Topological Characterization and Uncertainty Visualization of Atmospheric Rivers." *Computer Graphics Forum (Proc. EuroVis 2024)*, 43(3):e14987, 2024.

9. [**TVCG**] <u>Lin Yan</u>, Xin Liang, **Hanqi Guo**, and Bei Wang, "TopoSZ: Preserving Topology in Error-Bounded Lossy Compression." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE VIS 2023)*, 30(1):1302–1312, 2024.

10. [**TVCG**] Lin Yan, **Hanqi Guo**, Tom Peterka, Bei Wang, and Jiali Wang, "TROPHY: A Topologically Robust Physics-Informed Tracking Framework for Tropical Cyclone." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE VIS 2023)*, 30(1):1249–1259, 2024.

11. [**TVCG**] Skylar Wurster, Tianyu Xiong, Han-Wei Shen, **Hanqi Guo**, and Tom Peterka, "Adaptively Placed Multi-Grid Scene Representation Networks for Large-Scale Data Visualization." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE VIS 2023)*, 30(1):965-974, 2024.

12. [**CGF**] <u>Lin Yan</u>, Paul Aaron Ullrich, Luke P. Van Roekel, Bei Wang, and **Hanqi Guo**, "Multilevel Robustness for 2D Vector Field Feature Tracking, Selection, and Comparison." *Computer Graphics Forum, Wiley*, 42(6):e14799, 2023.

13. [**TVCG**] <u>Xin Liang</u>, Sheng Di, Franck Cappello, <u>Mukund Raj</u>, Chunhui Liu, Kenji Ono, Zizhong Chen, Tom Peterka, and **Hanqi Guo**, "Toward Feature-Preserving Vector Field Compression." *IEEE Transactions on Visualization and Computer Graphics*, 29(12):5434-5450, 2023.

14. [**TVCG**] <u>Jiayi Xu</u>, **Hanqi Guo**, Han-Wei Shen, <u>Mukund Raj</u>, Skylar W. Wurster, Tom Peterka, "Reinforcement Learning for Load-balanced Parallel Particle Tracing." *IEEE Transactions on Visualization and Computer Graphics*, 29(6):3052–3066, 2023.

15. [**TVCG**] Neng Shi, Jiayi Xu, Haoyu Li, **Hanqi Guo**, Jonathan Woodring, and Han-Wei Shen, "VDL-Surrogate: A View-Dependent Latent-based Model for Parameter Space Exploration of Ensemble Simulations." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE VIS 2022)*, 29(1):820–830, 2023. (**Best Paper Honorable Mention Award** in IEEE VIS 2022)

16. [**TVCG**] Neng Shi, <u>Jiayi Xu</u>, Skylar W. Wurster, **Hanqi Guo**, Jonathan Woodring, Luke Van Roekel, and Han-Wei Shen, "GNN-Surrogate: A Hierarchical and Adaptive Graph Neural

Network for Parameter Space Exploration of Unstructured-Mesh Ocean Simulations." *IEEE Transactions on Visualization and Computer Graphics*, 28(6):2301–2313, 2022.

17. [**TBD**] Yang Zhang, **Hanqi Guo**, Lanyu Shang, Dong Wang, and Tom Peterka, "A Multi-branch Decoder Network Approach to Adaptive Temporal Data Selection and Reconstruction for Big Scientific Simulation Data." *IEEE Transactions on Big Data*, 8(6):1637–1649, 2022.

18. [**TVCG**] **Hanqi Guo**, David Lenz, Jiayi Xu, Xin Liang, Wenbin He, Iulian R. Grindeanu, Han-Wei Shen, Tom Peterka, Todd Munson, and Ian Foster, "FTK: A High-Dimensional Simplicial Meshing Framework for Robust and Scalable Feature Tracking." *IEEE Transactions on Visualization and Computer Graphics*, 27(8):3463–3480, 2021.

19. [**TVCG**] Jiayi Xu, **Hanqi Guo**, Han-Wei Shen, Mukund Raj, Xueqiao Xu, Xueyun Wang, Zhehui Wang, and Tom Peterka, "Asynchronous and Load-Balanced Union-Find for Distributed and Parallel Scientific Data Visualization and Analysis." *IEEE Transactions on Visualization and Computer Graphics*, 27(6):2808–2820, 2021. (**Best Paper Award** in IEEE PacificVis '21)

20. [**IJHPCA**] Ian Foster, Mark Ainsworth, Julie Bessac, Franck Cappello, Jong Choi, Sheng Di, Ali Murat Gok, **Hanqi Guo**, Kevin A. Huck, Christopher Kelly, Scott Klasky, Kerstin Kleese van Dam, Xin Liang, Kshitij Mehta, Manish Parashar, Line Pouchard, Tong Shu, Hubertus van Dam, Justin M. Wozniak, Matthew Wolf, Wei Xu, Igor Yakushin, Shinjae Yoo, and Todd Munson, "Online Data Analysis and Reduction: An Important Co-Design Motif for Extreme-Scale Computers." *Journal of High-Performance Computing Applications*, 35(6):617–635, 2021.

21. [**TVCG**] Wenbin He, **Hanqi Guo**, Han-Wei Shen, and Tom Peterka, "*e*FESTA: Ensemble Feature Exploration with Surface Density Estimates." *IEEE Transactions on Visualization and Computer Graphics*, 26(4):1716–1731, 2020.

22. [**TVCG**] Wenbin He, Junpeng Wang, **Hanqi Guo**, Ko-Chih Wang, Han-Wei Shen, Mukund Raj, Youssef S. G. Nashed, and Tom Peterka, "InSituNet: Deep Image Synthesis for Parameter Space Exploration of Ensemble Simulations." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE SciVis '19)*, 26(1):23-033, 2020. (**Best Paper Award** in IEEE VIS 2019)

23. [**POP**] Zhehui Wang, Jiayi Xu, Yao E. Kovach, Bradley T. Wolfe, Edward Thomas Jr., **Hanqi Guo**, John E. Foster, and Han-Wei Shen, "Microparticle Cloud Imaging and Tracking for Data-Driven Plasma Science." *Physics of Plasmas*, AIP Publishing, 27(3):033703, 2020.

24. [**VISINF**] Wenbin He, Junpeng Wang, **Hanqi Guo**, Han-Wei Shen, and Tom Peterka, "CE-CAV: Collective Ensemble Comparison and Visualization using Deep Neural Networks." *Visual Informatics*, 4(2):109–121, 2020.

25. [**TVCG**] **Hanqi Guo**, Wenbin He, Sangmin Seo, Han-Wei Shen, Emil Mihai Constantinescu, Chunhui Liu, and Tom Peterka, "Extreme-Scale Stochastic Particle Tracing for Uncertain Unsteady Flow Visualization and Analysis." *IEEE Transactions on Visualization and Computer Graphics*, 29(9):2710–2724, 2019.

26. [**IJHPCA**] Dingwen Tao, Sheng Di, **Hanqi Guo**, Zizhong Chen, and Franck Cappello, "Z-checker: A Framework for Assessing Lossy Compression of Scientific Data." *International Journal of High Performance Computing Applications*, 33(2):285–303, 2019.

27. [**TPDS**] Sheng Di, **Hanqi Guo**, Rinku Gupta, Eric R. Pershey, Marc Snir, and Franck Cappello, "Exploring Properties and Correlations of Fatal Events in a Large-Scale HPC System." *IEEE Transactions on Parallel and Distributed Systems*, 30(2):361–374, 2019.

28. [**TVCG**] Jun Tao, Martin Imre, Chaoli Wang, Nitesh V. Chawla, **Hanqi Guo**, Gökhan Sever, and Seung Hyun Kim, "Exploring Time-Varying Multivariate Volume Data Using Matrix of Isosurface Similarity Maps." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE SciVis '18)*, 25(1):1236–1245, 2019.

29. [**CG&A**] Jun Han, Jun Tao, **Hanqi Guo**, Danny Z. Chen, and Chaoli Wang, "Flow Field Reduction via Reconstructing Vector Data from 3D Streamlines Using Deep Learning." *IEEE Computer Graphics and Applications*, 39(4):54–67, 2018.

30. [**TVCG**] Jiang Zhang, **Hanqi Guo**, Xiaoru Yuan, Fan Hong, and Tom Peterka, "Dynamic Load Balancing Based on Constrained K-D Tree Decomposition for Parallel Particle Tracing." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE SciVis '17)*, 24(1):954–963, 2018.

31. [**JOV**] Fan Hong, Chongke Bi, **Hanqi Guo**, Kenji Ono, and Xiaoru Yuan, "Compression-based Integral Curve Data Reuse Framework for Flow Visualization." *Journal of Visualization*, 20(4):859–874, 2017. (**Best Paper Award** in ChinaVis 2016)

32. [**JOV**] Richen Liu, **Hanqi Guo**, and Xiaoru Yuan, "User-Defined Feature Comparison for Vector Field Ensembles." *Journal of Visualization*, 20(2):217–229, 2017.

33. [**TVCG**] **Hanqi Guo**, <u>Wenbin He</u>, Tom Peterka, Han-Wei Shen, Scott M. Collis, and Jonathan J. Helmus, "Finite-Time Lyapunov Exponents and Lagrangian Coherent Structures in Uncertain Unsteady Flows." *IEEE Transactions on Visualization and Computer Graphics*, 22(6):1672–1682, 2016.

34. [**PRE**] Carolyn L. Phillips*, **Hanqi Guo***, Tom Peterka, Dmitry Karpeyev, and Andreas Glatz, "Tracking Vortices in Superconductors: Extracting Singularities from a Discretized Complex Scalar Field Evolving in Time." *Physical Review E: Statistical, Nonlinear, and Soft Matter Physics*, 93(023305), 2016. (*Co-First Author)

35. [**TVCG**] **Hanqi Guo**, Carolyn L. Phillips, Tom Peterka, Dmitry Karpeyev, and Andreas Glatz, "Extracting, Tracking, and Visualizing Vortices in 3D Complex-Valued Superconductor Simulation Data." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE SciVis '15)*, 22(1):827–836, 2016.

36. [**TVCG**] **Hanqi Guo**, Jiang Zhang, Richen Liu, Lu Liu, Xiaoru Yuan, Jian Huang, Xiangfei Meng, and Jingshan Pan, "Advection-based Sparse Data Management for Visualizing Unsteady Flow." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE SciVis '14)*, 20(12):2555–2564, 2014.

37. [**TVCG**] Fan Hong, Chufan Lai, **Hanqi Guo**, Enya Shen, Xiaoru Yuan, and Sikun Li, "FLDA: Latent Dirichlet Allocation Based Unsteady Flow Analysis." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE SciVis '14)*, 20(12):2545–2554, 2014.

38. [**JOV**] Richen Liu, **Hanqi Guo**, and Xiaoru Yuan, "Seismic Structure Extraction Based on Multi-scale Sensitivity Analysis." *Journal of Visualization*, 17(3):157–166, 2014.

39. [**TVCG**] **Hanqi Guo**, Xiaoru Yuan, Jian Huang, and Xiaomin Zhu, "Coupled Ensemble Flow Line Advection and Analysis." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE SciVis '13)*, 19(12):2733–2742, 2013.

40. [**TVCG**] **Hanqi Guo**, He Xiao, and Xiaoru Yuan, "Scalable Multivariate Volume Visualization and Analysis based on Dimension Projection and Parallel Coordinates." *IEEE Transactions on Visualization and Computer Graphics*, 18(9):1397–1410, 2012.

41. [**TVCG**] **Hanqi Guo**, Ningyu Mao, and Xiaoru Yuan, "WYSIWYG (What You See Is What You Get) Volume Visualization." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE Vis '11)*, 17(3):2106–2114, 2011.

42. [**TVCG**] Xiaoru Yuan, He Xiao, **Hanqi Guo**, Peihong Guo, Wesley Kendall, Jian Huang, and Yongxian Zhang, "Scalable Multi-variate Analytics of Seismic and Satellite-based Observational Data." *IEEE Transactions on Visualization and Computer Graphics (Proc. IEEE Vis '10)*, 16(3):1413–1420, 2010.

REFEREED CONFERENCE FULL PAPERS

43. [**IPDPS'26**] <u>Congrong Ren</u>, Robert Underwood, Sheng Di, Emrecan Kutay, Zarija Lukic, Aylin Yener, Franck Cappello, and **Hanqi Guo**, "FFCz: Fast Fourier Correction for Spectrum-Preserving Lossy Compression of Scientific Data." In *IPDPS '26: Proceedings of 39th IEEE International Parallel and Distributed Processing Symposium*, 2026. (Accepted)

44. [**IPDPS'26**] <u>Yuxiao Li</u>, Mingze Xia, Xin Liang, Bei Wang, Robert Underwood, Sheng Di, Hemant Sharma, Dishant Beniwal, Franck Cappello, and **Hanqi Guo** "pMSz: A Distributed Parallel Algorithm for Correcting Morse-Smale Segmentations for Lossy Compression." In *IPDPS '26: Proceedings of 39th IEEE International Parallel and Distributed Processing Symposium*, 2026. (Accepted)

45. [**ICDE'25**] Mingze Xia, Bei Wang, <u>Yuxiao Li</u>, Pu Jiao, Xin Liang, and **Hanqi Guo**, "TspSZ: An Efficient Parallel Error-Bounded Lossy Compressor for Topological Skeleton Preservation." In *ICDE '25: Proceedings of the 41st IEEE International Conference on Data Engineering*, pp.3682–3695, 2025.

46. [**IPDPS'25**] Xuan Wu, Sheng Di, <u>Congrong Ren</u>, Pu Jiao, Mingze Xia, Cheng Wang, **Hanqi Guo**, Xin Liang, and Franck Cappello, "Enabling Efficient Error-controlled Lossy Compression for Unstructured Scientific Data." In *IPDPS '25: Proceedings of 39th IEEE International Parallel and Distributed Processing Symposium*, pp.370–382, 2025. (**Best Paper Award**)

47. [**SIGMOD'25**] Longtao Zhang, Ruoyu Li, <u>Congrong Ren</u>, Sheng Di, Jinyang Liu, Jiajun Huang, Robert Underwood, Pascal Grosset, Dingwen Tao, Xin Liang, **Hanqi Guo**, Franck Cappello, and Kai Zhao, "LCP: Enhancing Scientific Data Management with Lossy Compression for Particles." In *Proceedings of the ACM on Management of Data*, 3(1):50:1-50:27, 2025.

48. [**ICDE'24**] Mingze Xia, Sheng Di, Franck Cappello, Pu Jiao, Kai Zhao, Jinyang Liu, Xuan Wu, and Hanqi Guo, "Preserving Topological Feature with Sign-of-Determinant Predicates in Lossy Compression: A Case Study of Vector Field Critical Points." In *ICDE'24: Proceedings of IEEE International Conference on Data Engineering*, Utrecht, Netherlands, pp. 4979–4992, 2024. (Accepted)

49. [**PacificVis'23**] Skylar Wurster, **Hanqi Guo**, Tom Peterka, and Han-Wei Shen, "Neural Stream Functions." In *Proceedings of IEEE Pacific Visualization Symposium*, pages 132–141, Seoul, Korea, April 18-21, 2023. (Accepted)

50. [**VLDB'23**] Pu Jiao, Sheng Di, **Hanqi Guo**, Kai Zhao, Jiannan Tian, Dingwen Tao, Xin Liang, and Franck Cappello, "Toward Quantity-of-Interest Preserving Lossy Compression for Scientific Data." In *Proceedings of the VLDB Endowment*, 16(4):697-710, 2022.

51. [**LDAV'21**] Dmitriy Morozov, Tom Peterka, **Hanqi Guo**, <u>Mukund Raj</u>, <u>Jiayi Xu</u>, and Han-Wei Shen, "IExchange: Asynchronous Communication and Termination Detection for Iterative Algorithms." In *LDAV'21: Proceedings of IEEE Symposium on Large Data Analysis and Visualization*, pages 12–21, 2021.

52. [**PacificVis'20**] <u>Xin Liang</u>, **Hanqi Guo**, Sheng Di, Franck Cappello, <u>Mukund Raj</u>, Chunhui Liu, Kenji Ono, Zizhong Chen, and Tom Peterka, "Toward Feature-Preserving 2D and 3D Vector Field Compression." In *Proceedings of IEEE Pacific Visualization (PacificVis '20)*, pages 81–90, Tianjin, China, June 3–5, 2020.

53. [**DSN'19**] Sheng Di, **Hanqi Guo**, Eric R. Pershey, Marc Snir, and Franck Cappello, "Characterizing and Understanding HPC Job Failures over The 2K-day Life of IBM BlueGene/Q System." In *Proceedings of IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2019)*, pages 473–484, Portland, Oregon, June 24–27, 2019.

54. [**ISVC'19**] <u>Martin Imre</u>, <u>Jun Han</u>, Julien Dominski, Michael Churchill, Ralph Kube, Choong-Seock Chang, Tom Peterka, **Hanqi Guo**, and Chaoli Wang "ContourNet: Salient Local Contour Identification for Blob Detection in Plasma Fusion Simulation Data." In *ISVC'19: Proceedings of International Symposium on Visual Computing*, pages 289–301, Lake Tahoe, NV, 2019.

55. [**LDAV'19**] <u>Wenbin He</u>, **Hanqi Guo**, Tom Peterka, Sheng Di, Franck Cappello, and Han-Wei Shen, "Parallel Partial Reduction for Large-Scale Data Analysis and Visualization." In *Proceedings of IEEE Symposium on Large Data Analysis and Visualization*, pages 45–55, Berlin, Germany, October 21, 2018. (**Best Paper Honorable Mention Award** in LDAV '18)

56. [**EGPGV'18**] **Hanqi Guo**, Sheng Di, Rinku Gupta, Tom Peterka, and Franck Cappello, "*La VALSE*: Scalable Log Visualization for Fault Characterization in Supercomputers." In *Proceedings of EuroGraphics Symposium on Parallel Graphics and Visualization (EGPGV '18)*, pages 91–100, Brno, Czech Republic, June 4, 2018.

57. [**PacificVis'18**] <u>Jiang Zhang</u>, **Hanqi Guo**, Xiaoru Yuan, and Tom Peterka, "Dynamic Data Repartitioning for Load-Balanced Parallel Particle Tracing." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '18)*, pages 86–95, Kobe, Japan, April 10–13, 2018.

58. [**BigData'18**] Xin Liang, Sheng Di, Dingwen Tao, Sihuan Li, Shaomeng Li, **Hanqi Guo**, Zizhong Chen, and Franck Cappello, "Error-Controlled Lossy Compression Optimized for High Compression Ratios of Scientific Datasets." In *Proceedings of IEEE International Conference on BIG DATA*, pages 443–447, Seattle, WA, December 10–13, 2018.

59. [**eScience'18**] Jong Youl Choi, Choong-Seock Chang, Julien Dominski, Scott Klasky, Gabriele Merlo, Eric Suchyta, Mark Ainsworth, Bryce Allen, Franck Cappello, Michael Churchill, Philip Davis, Sheng Di, Greg Eisenhauer, Stephane Ethier, Ian Foster, Berk Geveci, **Hanqi Guo**, Kevin Huck, Frank Jenko, Mark Kim, James Kress, Seung-Hoe Ku, Qing Liu, Jeremy Logan, Allen Malony, Kshitij Mehta, Kenneth Moreland, Todd Munson, Manish Parashar, Tom Peterka, Norbert Podhorszki, Dave Pugmire, Ozan Tugluk, Ruonan Wang, Ben Whitney, Matthew Wolf,

and Chad Wood, "Coupling Exascale Multiphysics Applications: Methods and Lessons Learned." In *Proceedings of IEEE International Conference on eScience 2018*, pages 442–452, Amsterdam, Netherlands, October 29–November 1, 2018.

60. [**SAVIS'17**] Fan Hong, Siming Chen, **Hanqi Guo**, Xiaoru Yuan, Jian Huang, and Yongxian Zhang, "Visual Eexploration of Ionosphere Disturbances for Earthquake Research." In *Proceedings of SIGGRAPH Asia 2017 Symposium on Visualization*, pages 2:1–2:8, Bangkok, Thailand, November 27–30, 2017. (**Best Paper Honorable Mention Award**)

61. [**PacificVis'17**] **Hanqi Guo**, Tom Peterka, and Andreas Glatz, "In Situ Magnetic Flux Vortex Visualization in Time-Dependent Ginzburg-Landau Superconductor Simulations." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '17)*, pages 71–80, Seoul, Korea, April, 18–21, 2017.

62. [**PacificVis'16**] Qingya Shu, **Hanqi Guo**, Jie Liang, Limei Che, Junfeng Liu, and Xiaoru Yuan, "*EnsembleGraph*: Interactive Visual Analysis of Spatialtemporal Behaviors for Ensemble Simulation Data." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '16)*, pages 56–63, Taipei, April 12–15, 2016.

63. [**PacificVis'16**] Jiang Zhang, **Hanqi Guo**, and Xiaoru Yuan, "Efficient Unsteady Flow Visualization with High-Order Access Dependencies." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '16)*, pages 82–97, Taipei, April 12–15, 2016.

64. [**PacificVis'16**] Richen Liu, **Hanqi Guo**, Jiang Zhang, and Xiaoru Yuan, "Comparative Visualization of Vector Field Ensembles Based on Longest Common Subsequence." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '16)*, pages 96–103, Taipei, April 12–15, 2016.

65. [**SAVIS'15**] Richen Liu, **Hanqi Guo**, and Xiaoru Yuan, "A Bottom-Up Scheme for User-Defined Feature Comparison in Ensemble Data." In *Proceedings of SIGGRAPH Asia 2015 Symposium on Visualization in High Performance Computing*, pages 10:1–10:4, Kobe, Japan, November 2–5, 2015.

66. [**PacificVis'14**] **Hanqi Guo**, Fan Hong, Qingya Shu, Jiang Zhang, Jian Huang, and Xiaoru Yuan, "Scalable Lagrangian-based Attribute Space Projection for Multivariate Unsteady Flow Data." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '14)*, pages 33–40, Yokohama, Japan, Mar. 4–7, 2014.

67. [**PacificVis'13**] **Hanqi Guo** and Xiaoru Yuan, "Local WYSIWYG Volume Visualization." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '13)*, pages 65–72, Sydney, NSW, Australia, Feb. 26–Mar. 1, 2013.

68. [**PacificVis'12**] **Hanqi Guo**, Xiaoru Yuan, Jie Liu, Guihua Shan, Xuebin Chi, and Fei Sun, "Interference Microscopy Volume Illustration for Biomedical Data." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '12)*, pages 177–184, Songdo, Korea, Feb. 28–Mar. 2, 2012.

69. [**PacificVis'11**] **Hanqi Guo**, He Xiao, and Xiaoru Yuan, "Multi-Dimensional Transfer Function Design based on Flexible Dimension Projection Embedded in Parallel Coordinates." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '11)*, pages 19–26, Hong Kong, March 1–4, 2011.

70. [**PacificVis'11**] **Hanqi Guo**, Zuchao Wang, Bowen Yu, Huijing Zhao, and Xiaoru Yuan, "TripVista: Triple Perspective Visual Trajectory Analytics and Its Application on Microscopic Traffic Data at a Road Intersection." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '11)*, pages 163–170, Hong Kong, March 1–4, 2011.

REFEREED CONFERENCE SHORT PAPERS

71. [**VIS'21**] **Hanqi Guo** and Tom Peterka, "Exact Analytical Parallel Vectors." In *Proceedings of IEEE VIS Short Papers*, pages 101–105, 2021. (**Best Short Paper Honorable Mention**)

72. [**PacificVis'14**] **Hanqi Guo**, Wei Li, and Xiaoru Yuan, "Transfer Function Map." In *Proceedings of IEEE Pacific Visualization Symposium (PacificVis '14), Notes Paper*, pages 262–266, Yokohama, Japan, Mar. 4–7, 2014.

REFEREED
WORKSHOP
PAPERS

73. [**LDAV'25**] <u>Yongfeng Qiu</u>, Yuxiao Li, Xin Liang, Yafan Huang, Guanpeng Li, Sheng Di, Franck Cappello, and **Hanqi Guo**, "Lossy Parallel Visualization of Large-Scale Volume Data with Error-Bounded Image Compositing." *The 15th IEEE Workshop on Large Data Analysis and Visualization*, in conjunction with IEEE VIS 2025 Vienna, Austria, 2025. (**Best Paper Award**)

74. [**LDAV'25**] Guanqun Ma, David Lenz, **Hanqi Guo**, Tom Peterka, and Bei Wang, "Extracting Complex Topology from Multivariate Functional Approximation: Contours, Jacobi Sets, and Ridge-Valley Graphs." *The 15th IEEE Workshop on Large Data Analysis and Visualization*, in conjunction with IEEE VIS 2025 Vienna, Austria, 2025. (Accepted)

75. [**TopoInVis'24**] Guanqun Ma, David Lenz, Tom Peterka, **Hanqi Guo**, and Bei Wang, "Critical Point Extraction from Multivariate Functional Approximation." *IEEE Workshop on Topological Data Analysis and Visualization*, in conjunction with IEEE VIS 2024, Florida, USA, pp.12–22, 2024.

76. [**WOIV'18**] Mark Kim, James Kress, Jong Youl Choi, Norbert Podhorszki, Scott Klasky, Matthew Wolf, Kshitij Mehta, Kevin Huck, Berk Geveci, Sujin Phillip, Robert Maynard, **Hanqi Guo**, Tom Peterka, Kenneth Moreland, Choong-Seock Chang, Julien Dominski, Michael Churchill, and David Pugmire, "In Situ Analysis and Visualization of Fusion Simulations: Lessons Learned." *ISC Workshop on In Situ Visualization*, 2018.

UNREFEREED
PAPERS

77. [**EuroPar'17**] Ian Foster, Mark Ainsworth, Bryce Allen, Julie Bessac, Franck Cappello, Jong Youl Choi, Emil Constantinescu, Philip E. Davis, Sheng Di, Wendy Di, **Hanqi Guo**, Scott Klasky, Kerstin Kleese Van Dam, Tahsin Kurc, Qing Liu, Abid Malik, Kshitij Mehta, Klaus Mueller, Todd Munson, George Ostouchov, Manish Parashar, Tom Peterka, Line Pouchard, Dingwen Tao, Ozan Tugluk, Stefan Wild, Matthew Wolf, Justin M. Wozniak, Wei Xu, and Shinjae Yoo, "Computing Just What You Need: Online Data Analysis and Reduction at Extreme Scales." In *Proceedings of International Conference on Parallel and Distributed Computing (EuroPar '17)*, pages 3–19, 2017.

ARXIV
PREPRINTS

78. Mingze Xia, Yuxiao Li, Pu Jiao, Bei Wang, Xin Liang, and **Hanqi Guo**, "Time-varying Vector Field Compression with Preserved Critical Point Trajectories." arXiv:2510.25143 [cs.DB], 2025.

79. [**arXiv**] Ruoyu Li, Yafan Huang, Longtao Zhang, Zhuoxun Yang, Sheng Di, Jiajun Huang, Jinyang Liu, Jiannan Tian, Xin Liang, Guanpeng Li, **Hanqi Guo**, Franck Cappello, and Kai Zhao, "GPZ: GPU-Accelerated Lossy Compressor for Particle Data." arXiv:2508.10305 [cs.DC], 2025.

80. [**arXiv**] <u>Congrong Ren</u>, Sheng Di, Longtao Zhang, Kai Zhao, and **Hanqi Guo**, "An Error-Bounded Lossy Compression Method with Bit-Adaptive Quantization for Particle Data." arXiv:2404.02826 [cs.IT], 2024.

CONFERENCE
POSTERS
(SELECTED)

- Yongfeng Qiu, Yuxiao Li, Xin Liang, Yafan Huang, Guanpeng Li, Sheng Di, Franck Cappello, and **Hanqi Guo**, "Lossy Parallel Visualization of Large-Scale Volume Data with Error-Bounded Image Compositing." *2025 IEEE International Parallel and Distributed Processing Symposium Workshops*, Milan, Italy, May 27–31, 2025.

- Lin Yan, **Hanqi Guo**, Colin M. Zarzycki, Chunyong Jung, Tom Peterka, and Jiali Wang, "Validation of a Topologically Robust Physics-Informed Tracking Algorithm: TROPHY." *AGU (American Geophysical Union) 2022 Fall Meeting*, Chicago, IL, December 12–16, 2022.

- Choongseok Chang, Seung-Hoe Ku, Michael Churchill, Ralph Kube, Robert Hager, **Hanqi Guo**, Jong Choi, David Pugmire, and Scott Klasky, "Discovery of micro-turbulent homoclinic tangle near magnetic X-point from the XGC total-f electromagnetic simulation." *64th Annual Meeting of the APS Division of Plasma Physics*, Spokane, Washington, October 17—21, 2022.

- Qingya Shu, **Hanqi Guo**, Limei Che, Weicong Lyu, and Xiaoru Yuan, "*EnsembleGraph*: Visualizing Variations for Ensemble Simulation Exploration." *IEEE VIS 2014 (Poster)*, Paris, France, November 9–14, 2014. (**Best Poster Honorable Mention Award**)

- **Hanqi Guo**, He Xiao, Min Lu, and Xiaoru Yuan, "Scalable Multivariate Volume Visualization and Analysis." *IEEE Symposium on Large-Scale Data Analysis and Visualization 2011 (Poster)*. Providence, RI, October 23–24, 2011.

- **Hanqi Guo**, Carolyn L. Phillips, Tom Peterka, Dmitry Karpeyev, and Andreas Glatz, "Extracting, Tracking, and Visualizing Magnetic Flux Vortices in 3D Complex-Valued Superconductor Simulation Data." *SciDAC PI Meeting*, Bethesda, MD, July 22–24, 2015.

Conference Organizing Committee Members
- IEEE VIS Conference
  - Fast Forwards & Video Previews Co-Chair **2017**
  - Student Volunteer Co-Chair **2015**
- IEEE Pacific Visualization Symposium
  - Poster Co-Chair **2023**
- China Visualization and Visual Analytics Conference (ChinaVis)
  - Paper Co-Chair **2020–2021**
  - Poster Co-Chair **2017–2019**

Conference Program Committee Members
- IEEE VIS
  - Full Papers **2015–2017, 2020–2022**
  - Short Papers **2021–2022, 2024**
- The International Conference for High Performance Computing, Networking, Storage and Analysis (ACM/IEEE SC)
  - Data Analytics, Visualization, and Storage **2023, 2025**
  - In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization (ISAV Workshop) **2016**
- Eurographics/IEEE-VGTC Symposium on Visualization (EuroVis) **2026**
- IEEE International Parallel and Distributed Processing Symposium (IPDPS)
  - Algorithms for Computational Science **2024**
  - Multidisciplinary Program **2023**
- IEEE Pacific Visualization Symposium
  - Journal Track **2025**
  - Conference Track **2024**
  - Full Papers **2016–2017, 2020–2022**
  - Visualization Notes **2015–2021**
  - Visualization Meets AI Workshop **2023–2024**
- IEEE International Conference on Cluster Computing (CLUSTER)
  - Data Analytics, Visualization and Storage **2021**
- IEEE Big Data
  - International Workshop on Big Data Reduction (IWBDR) **2020–2021**
- IEEE Symposium on Large Data Analysis and Visualization (LDAV) **2019, 2021–2023**
- SIGGRAPH Asia Symposium on Visualization **2017**
- EuroGraphics Symposium on Parallel Graphics and Visualization (EGPGV) **2017–2021**
- International Symposium on Visual Computing (ISVC) **2018–2021**
- IS&T Visualization and Data Analysis (VDA) Conference **2019**
- China Visualization and Visual Analytics Conference (ChinaVis) **2014–2019**
- HPC China **2014–2019**
- IEEE Workshop on Topological Data Analysis and Visualization (TopoInVis) **2023–2024**

Conference Best Paper Committee Members
- China Visualization and Visual Analytics Conference (ChinaVis) **2022**
- Eurographics Symposium on Parallel Graphics and Visualization (EGPGV) **2018, 2021**

Journal Editorial/Review Board Member
- Associate Editor, IEEE Transactions on Visualization and Computer Graphics **2025–**
- Guest Editor, Journal of Visualization, Springer, Special Issues on ChinaVis **2020–2021**
- Review Editor for Data Science, Frontiers in Big Data, Frontiers Media S.A. **2023–**

Journal Paper Reviewers
- Transactions on Visualization and Computer Graphics (TVCG), IEEE **Since 2014**
- Transactions on Computers (TC), IEEE **Since 2022**
- Transactions on Parallel and Distributed Systems (TPDS), IEEE **Since 2018**
- Transactions on Knowledge and Data Engineering (TKDE), IEEE **Since 2025**
- Transactions on Big Data (TBD), IEEE **Since 2021**
- Transactions on Plasma Science (TPS), IEEE **Since 2019**
- Transactions on Interactive Intelligent Systems (TiiS), ACM **Since 2021**
- Computer Graphics Forum (CGF), Wiley **Since 2015**

- Parallel Computing (PARCO), Elsevier **Since 2022**
- The Visual Computer, Springer **Since 2017**
- Journal of Visualization (JOV), Springer **Since 2014**
- Information Visualization, SAGE Publications **Since 2016**
- Journal of Visual Languages and Computing (JVLC), Elsevier **Since 2018**
- Journal of Imaging Science and Technology (JIST), IS&T **Since 2019**
- Journal of Scientific Computing, Springer **Since 2019**
- Scientific Programming, Hindawi **Since 2019**
- Journal of Computer Science and Technology (JCST), Springer **Since 2013**

Conference Paper External Reviewers
- IEEE VIS **2012, 2014, 2016, 2018–2020, 2023**
- Eurographics/IEEE-VGTC Symposium on Visualization (EuroVis) **2015–2018, 2020, 2025**
- IEEE Pacific Visualization Symposium (PacificVis) **2014–2015, 2024**
- Eurographics/IEEE-VGTC Symposium on Visualization (EuroVis), State-of-the-Art Reports (STARs) **2016–2017, 2023**
- IEEE Cluster **2020**
- ACM CHI Conference **2022**
- IEEE Symposium on Biological Data Visualization (BioVis) **2013**
- International Conference on Computer-Aided Design and Computer Graphics (CAD/CG) **2013**
- International Conference on Information Visualization Theory and Applications (IVAPP) **2014**

Proposal Reviewers
- U.S. Department of Energy
- U.S. National Science Foundation
- Swiss National Science Foundation

Conference Session Chairs
- IEEE VIS, Scientific Visualization, Ensembles, and Accessibility **2022**
- IEEE VIS, Scalability and Rendering **2021**
- IEEE VIS, Deep Learning for Spatial Data **2020**
- IEEE VIS, Flow Visualization **2017**
- IEEE Symposium on Large Data Analysis and Visualization, Uncertain Data **2018**
- IEEE Pacific Visualization Symposium (PacificVis), Molecular Visualization **2016**

INTERNAL
SERVICES

The Ohio State University
- Reviewer, Presidential Fellowship Committee **2025**

College of Engineering, The Ohio State University
- Award Committee **2023**

Department of Computer Science and Engineering, The Ohio State University
- Graduate Studies Committee **2025–**
- Graduate Admissions Committee **2022–**
- Space Committee **2024**
- Award Committee **2023**
- Diversity, Equity, and Inclusion Committee **2022**

Mathematics and Computer Science Division, Argonne National Laboratory
- Postdoc Hiring Committee **2017–2019**
- Postdoc Supervisor and Mentor **2018–2022**
- Summer Research Aide Mentor **2015–2022**
- Navigator for New Hires **2018–2022**
- Argonne Training Program on Extreme-Scale Computing (ATPESC) **2020–2022**

POSTDOC
SUPERVISION

The Ohio State University
- Guoxi Liu, March 2025–, working on multidimensional feature tracking

Argonne National Laboratory

- Lin Yan, June 2022–December 2023, worked on topological data analysis for climate data
- Mukund Raj, May 2018–May 2021, worked on in situ flow visualization for ocean climate simulations

- Yi-Tang Chen, Candidacy Exam Committee, The Ohio State University, 2025
- Ziwei Li, Candidacy Exam Committee, The Ohio State University, 2025
- Tianyu Xiong, Candidacy Exam Committee, The Ohio State University, 2025
- Skylar Wurster, Doctoral Committee and Candidacy Exam Committee, The Ohio State University, 2024
- Haoyu Li, Doctoral Committee and Candidacy Exam Committee, The Ohio State University, 2024
- Xiaoqi Wang, Candidacy Exam Committee, The Ohio State University, 2024
- Neng Shi, Candidacy Exam Committee, The Ohio State University, 2023
- Jingyi Shen, Candidacy Exam Committee, The Ohio State University, 2023
- Yamei Tu, Departmental Representative for Candidacy Exam, The Ohio State University, 2023
- Michael Menart, Departmental Representative for Candidacy Exam, The Ohio State University, 2023
- Fangfei Lan, Candidacy Exam Committee, University of Utah, 2023
- Jun Han, Doctoral Committee and Candidacy Exam Committee, University of Notre Dame, 2022
- Yang Zhang, Candidacy Exam Committee, University of Notre Dame, 2021
- Martin Imre, Doctoral Committee and Candidacy Exam Committee, University of Notre Dame, 2019

The Ohio State University
- Congrong Ren, PhD Student, Spring 2023–
- Yuxiao Li, PhD Student, Autumn 2023–
- Yongfeng Qiu, PhD Student, Autumn 2023–
- Siheng Zhang, PhD Student, Autumn 2025–
- Alex Gulko, Undergraduate Intern, Fall 2022–
- Musab Fiqi, Master Student, Autumn 2023–Autumn 2024
- Hrithik Devaiah Bollachettira Ajithkumar, Master Student, Autumn 2024–Spring 2025

Argonne National Laboratory
- Fangfei Lan (University of Utah), Summer 2022. Worked on feature extraction and tracking for atmospheric data
- Neng Shi (The Ohio State University), Summer 2022. Worked on surrogate models for mining teleconnections in climate systems
- Lin Yan (University of Utah), Summer 2021, Fall 2021, and Spring 2022. Worked on topology data analysis for ensemble ocean climate simulations
- Skylar W. Wurster (The Ohio State University), Summer 2020, Summer 2021, and Summer 2022. Worked on deep hierarchical super-resolution for scientific data reduction and visualization
- Yang Zhang (University of Notre Dame), Summer 2020. Worked on a multi-branch decoder network approach to adaptive temporal data selection and reconstruction for big scientific simulation data, which is published by IEEE TBD in 2021
- Jiayi Xu (The Ohio State University), Summer 2019. Worked on scalable feature tracking algorithms, which led to the Best Paper Award in IEEE PacificVis and a TVCG paper in 2021
- Xin Liang (University of California, Riverside), Summer 2019. Worked on feature preserving lossy compression, which led to an IEEE PacificVis paper in 2020
- Martin Imre (University of Notre Dame), Summer 2018. Worked on deep learning based feature tracking for plasma fusion simulations
- Jun Han (University of Notre Dame), Summer 2018. Worked on vector field reconstruction using deep learning, which is published by IEEE CG&A in 2019
- Jiang Zhang (Peking University, China), Summer 2016. Worked on dynamic load balancing algorithms for flow visualization, which led to an IEEE VIS/TVCG paper in 2017 and a PacificVis paper in 2018
- Wenbin He (The Ohio State University), Summer 2015 and Summer 2016. Worked on parallel partial reduction algorithms for large-scale data analysis and visualization, which led to an Honorable Mention Award paper in IEEE LDAV in 2018; also worked on FTLE and LCS computation of uncertain flows, which led to an IEEE PacificVis/TVCG publication in 2016

TEACHING	• CSE 5542 - Real-Time Rendering, Spring 2023, Autumn 2023, Autumn 2024, Spring 2025, Autumn 2025
	• CSE 5559 - Intermediate Studies in Computer Graphics: Topological Data Analysis, Visualization, and Machine Learning, Autumn 2025
	• CSE 5559 - Intermediate Studies in Computer Graphics: AI for Visualization, Autumn 2022

TUTORIALS	• Tutorial Organizer, "Compression for Scientific Data," Co-Organized with Franck Cappello, Peter Lindstrom, Sheng Di, Dingwen Tao, Robert Underwood, Xin Liang, and Kai Zhao. ACM/IEEE SC24, Atlanta, GA
	• Guest Lecturer, "Vector Field Visualization," The Ohio State University, invited by Prof. Han-Wei Shen, Scientific Visualization (CSE 5194.02), March 21, 2022
	• Guest Lecturer, Advanced Visualization, "Extreme-Scale Feature Tracking for Science," University of California, Davis, invited by Prof. Kwan-Liu Ma, Advanced Visualization F21, November 4, 2021
	• Tutorial Organizer, "Statistical Data Representation, Visualization, and Uncertainty Analysis," Co-Organized with Soumya Dutta, Hans-Christian Hege, and Han-Wei Shen. IEEE VIS 2019, Vancouver, BC, Canada
	• Tutorial Organizer, Recent Feature Tracking Techniques, Co-Organized with Harsh Bhatia, Tino Weinkauf, Gunther H. Weber, and Han-Wei Shen. IEEE VIS 2018, Berlin, Germany, October 21, 2018
	• Tutorial Organizer, Recent Advancement in Feature-based Flow Visualization, Co-Organized with Jun Tao, Bei Wang, Christoph Garth, and Tino Weinkauf. IEEE VIS 2016, Baltimore, Maryland, October 23, 2016
	• Invited Speaker, the 7th Visualization Summer School of Peking University, Beijing, China, July 9–16, 2015
	• Invited Speaker, the 6th Visualization Summer School of Peking University, Beijing, China, July 17–24, 2014

INVITED TALKS	• 10/2/2024, Tailoring Topological Visualization, Data Compression, and AI Techniques for Climate Data. COSIM (Climate, Ocean, and Sea Ice Modeling) Seminar, Los Alamos National Laboratory (Virtual)
	• 10/31/2023, Visualization of Deforming Spacetime: A Novel Paradigm for Scientific Data Understanding. CS Seminar Series, Argonne National Laboratory (Virtual)
	• 5/19/2022, Feature Tracking with Simplicial Spacetime Meshing. Topological Data Visualizaton Workshop, May 16–20, 2022, University of Iowa (Virtual)
	• 4/11/2022, Intelligent Visualization for Science. Visualization Meets AI Workshop, co-located with IEEE PacificVis 2022, Tsukuba, Japan (Virtual)
	• 1/11/2022, Intelligent Visualization for Science. Department of Computer Science and Engineering, The Ohio State University, Columbus, OH (Virtual)
	• 4/29/2021, FTK: The Feature Tracking Kit. Department of Energy Computer Graphics Forum (DOECGF), Virtual
	• 4/25/2018, Dynamic Load Balancing for Particle Tracing. Department of Energy Computer Graphics Forum (DOECGF), Savannah, GA
	• 10/20/2017, Uncertainties in Big Data Visualization: Theory, Scalability, and Design. University of Notre Dame, South Bend, IN
	• 6/1/2017, Scalable Algorithms for the Visualization and Analysis of Uncertain Flows. Department of Electrical Engineering and Computer Science, University of Tennessee, Knoxville, TN
	• 5/3/2017, In Situ Magnetic Flux Vortex Visualization in Time-Dependent Ginzburg-Landau Superconductor Simulations. Department of Energy Computer Graphics Forum (DOECGF), National Renewable Energy Laboratory (NREL), Golden, CO
	• 4/19/2017, Scalable Algorithms for the Visualization and Analysis of Uncertain Flows. Department of Computer Science, Purdue University, West Lafayette, IN
	• 4/12/2017, Uncertainties in Big Data Visualization: Theory, Scalability, and Design. Mathematics and Computer Science Division, Argonne National Laboratory, Lemont, IL
	• 10/23/2016, Scalable Ensemble and Uncertain Flow Field Visualization, IEEE VIS 2016 Tutorial "Recent Advancements of Feature-based Flow Visualization and Analysis" with Jun Tao, Bei Wang, Christoph Garth, and Tino Weinkauf. Baltimore, MD
	• 4/28/2016, FTLE and LCS in Uncertain Unsteady Flows. Department of Energy Computer Graphics Forum (DOECGF), Pacific Grove, CA

- 1/21/2014, Scalable Lagrangian-based Visual Analysis on Multivariate Ensemble Simulations. Mathematics and Computer Science Division, Argonne National Laboratory, Lemont, IL

PRESS & MEDIA COVERAGE

- The Ohio State University, "Making big data manageable no small feat.", October 11, 2025. Available at: `https://engineering.osu.edu/news/2025/10/making-big-data-manageable-no-small-feat`
- Argonne National Laboratory, "Department of Energy names Argonne researchers to receive Early Career Research Program Awards." June 8, 2022. Available at: `https://www.anl.gov/article/department-of-energy-names-argonne-researchers-to-receive-early-career-research-program-awards`.
- Department of Energy, "DOE Awards $110 Million for Groundbreaking Research by 83 Early Career Scientists." June 7, 2022. Available at: `https://www.energy.gov/articles/doe-awards-110-million-groundbreaking-research-83-early-career-scientists`.
- insideHPC, "Toolkit Delivers 4D Visualization, Addresses Data Volume Challenges in Exascale." September 14, 2021. Available at: `https://insidehpc.com/2021/09/toolkit-delivers-4d-visualization-addresses-data-volume-challenges-in-exascale/`.
- Exascale Computing Project, "Novel Toolkit Delivers 4D Visualization Capabilities, Addresses Data Volume Challenges in Exascale." September 10, 2021. Available at: `https://www.exascaleproject.org/publication/novel-toolkit-delivers-4d-visualization-capabilities-addresses-data-volume-challenges-in-exascale/`
- Argonne National Laboratory, "Researchers win Best Paper Award at visualization conference." April 22, 2021. Available at: `https://www.anl.gov/mcs/article/researchers-win-best-paper-award-at-visualization-conference-0`
- Argonne National Laboratory, "LogAider: A Tool for Diagnosing System Failures." Janurary 21, 2020. Available at: `https://www.anl.gov/mcs/article/logaider-a-tool-for-diagnosing-system-failures`
- Argonne National Laboratory, "Using Artificial Intelligence to Detect Blobs." Janurary 20, 2020. Available at: `https://www.anl.gov/mcs/article/using-artificial-intelligence-to-detect-blobs`
- Argonne National Laboratory, "Researchers win Best Paper Award at Visualization Conference." October 30, 2019. Available at: `https://www.anl.gov/mcs/article/researchers-win-best-paper-award-at-visualization-conference`
- Argonne National Laboratory, "La VALSE." October 3, 2018. Available at: `https://www.anl.gov/mcs/article/la-valse`
- Argonne National Laboratory, "Guo receives postdoctoral performance award." August 14, 2017. Available at: `https://www.anl.gov/mcs/article/guo-receives-postdoctoral-performance-award`
- Argonne National Laboratory, "Defining Features in Uncertain Unsteady Flows." June 3, 2016. Available at: `https://www.anl.gov/mcs/article/defining-features-in-uncertain-unsteady-flows`

EDUCATION OUTREACH

- Advisor, Software Engineering Club, The Ohio State University, since Autumn 2023
- Guest Lecture, Hour of Code, Thomas Jefferson Junior High School, Woodridge, IL, 12/11/2020