

Jinzheng Wang, Ph.D.

Assistant Professor

Department of Computer Science

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RESEARCH INTERESTS

My research aims to enhance the ecosystem for **scientific data management** on High-performance Computing (HPC) systems.

1. **Improve** data compression algorithms that effectively reduce the volume of scientific data while maintaining fidelity;
2. **Design** data-adaptive progressive retrieval frameworks that intelligently reconstruct scientific data;
3. **Create** efficient data management applications that support diverse HPC workloads, from scientific computing to machine learning.

- High-performance Computing
- Parallel and Distributed Systems
- Scientific Data Management
- Data Reduction
- Scientific Machine Learning

WORK EXPERIENCE

Assistant Professor
University of North Carolina at Charlotte

Aug 2024 – current
Charlotte, NC, US

Assistant Professor
City University of New York -Brooklyn College

Sep 2023 – Aug 2024
Brooklyn, NY, US

Graduate Research Intern
Los Alamos National Laboratory

Sep 2022 -- May 2023
Los Alamos, NM, US

Summer Research Intern
Los Alamos National Laboratory

May 2022 -- Aug 2022
Los Alamos, NM, US

TEACHING EXPERIENCE

ITCS 6145/8145: Parallel Computing:
- Fall 2024, Spring 2025, Fall 2025, Spring 2026, Fall 2026

ITCS 6010/8010: Topics in Computer Science: AI System Design
- F2026

CISC.3310: Principles of Computer Architecture [BC@CUNY, S2024]

CISC.1050: Introduction to Computer Applications [BC@CUNY, F2023, S2024]

ECE-394: Digital Systems Laboratory [NJIT, F2018, S2019]

EDUCATION

Ph.D. in Electrical Engineering
New Jersey Institute of Technology

Jan 2018 - Aug 2023
Newark, NJ, US

M.S. in Electrical Engineering
New Jersey Institute of Technology

Sep 2015 - May 2017
Newark, NJ, US

B.S. in Internet of Things
Shandong University

Sep 2011 - May 2015
Jinan, Shandong, China

GRANTS

- CASCADE: Composable Assurance for AI-enabled Scientific Computing with Agentic Error Governance, PI: Jinzhen Wang, Department of Energy, The Genesis Mission: Transforming Science and Energy with AI, \$633,944, (UNC Charlotte portion: \$213,580), 2026 – 2027, research.
- NAIRR Pilot: An LLM-Driven Framework for Agentic Lossy Compression of Scientific Data, PI: Jinzhen Wang, National Artificial Intelligence Research Resource, CloudBank Research: \$5,000, TACC Vista (NVIDIA GH100 Grace Hopper Superchip): 500 node hours, Hugging Face Spaces and Compute Grants, 08/2026 – 08/2027, research;
- NAIRR Pilot Classroom: GPU Compute Resources for Graduate Parallel Computing Course, PI: Jinzhen Wang, National Artificial Intelligence Research Resource, Indiana Jetstream2 GPU: 200,000 Sus, 02/2026 – 06/2026, educational;
- CRII: OAC: Intelligent Error Control for Multi-tier Progressive Data Management, PI: Jinzhen Wang, National Science Foundation, Computer and Information Science and Engineering Research Initiation Initiative (CRII), \$174,965, 03/2025 – 03/2027, research;

PUBLICATIONS (WITH MY STUDENTS UNDERLINED)

- Adelina Zheng, Dong Dai, Sheng Di, Franck Cappello, **Jinzhen Wang***, PRISM: Lightweight Surrogation for Lossy Compression Quality Prediction, *the SC'26 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*, 2026. (*: Corresponding authors)
- Khondoker Mirazul Mumenin, Robert Underwood, Dong Dai, **Jinzhen Wang***, Sheng Di, Zarija Lukić, Franck Cappello, DeepCQ: A Two-Stage Deep-Surrogate Framework for Lossy Compression Quality Prediction, *the proceedings of 2026 IEEE International Conference on Cluster Computing (CLUSTER)*, IEEE, 2026 (*: Corresponding authors)
- Chence Yang, Ningxi Cheng, Ci Zhang, Lei Lu, Qitao Tan, Sheng Li, Ao Li, Xulong Tang, Shaoyi Huang, **Jinzhen Wang**, Guoming Li, Jundong Li, Xiaoming Zhai, Jin Lu, Jinhui Wang, Geng Yuan, Rethinking the Potential of Layer Freezing for DNN Training Efficiency, *Proceedings of the Great Lakes Symposium on VLSI 2026*. Association for Computing Machinery, New York, NY, USA, 772–778.
- Khondoker Mirazul Mumenin, Robert Underwood, Dong Dai, **Jinzhen Wang***, Sheng Di, Zarija Lukić, Franck Cappello, DeepCQ: General-Purpose Deep-Surrogate Framework for Lossy Compression Quality Prediction, *arXiv preprint arXiv:2512.21433*.
- Wenqi Jia, Zhewen Hu, Youyuan Liu, Boyuan Zhang, **Jinzhen Wang**, Jinyang Liu, Wei Niu, Stavros Kalafatis, Junzhou Huang, Sian Jin, Daoce Wang, Jiannan Tian, Miao Yin, NeurLZ: An Online Neural Learning-Based Method to Enhance Scientific Lossy Compression, *Proceedings of the 39th ACM International Conference on Supercomputing*, 2025.
- Chence Yang, Ci Zhang, Lei Lu, Qitao Tan, Sheng Li, Ao Li, Xulong Tang, Shaoyi Huang, **Jinzhen Wang**, Guoming Li, Jundong Li, Xiaoming Zhai, Jin Lu, Geng Yuan, Rethinking the Potential of Layer Freezing for Efficient DNN Training, *arXiv preprint arXiv:2508.1503*.

- Khondoker Mirazul Mumenin, Dong Dai, **Jinzhen Wang***, Sheng Di, QualityNet: Error-bounded Lossy Compression Quality Prediction via Deep Surrogate, *2024 IEEE International Conference on Big Data (BigData)*, 2024. (*: Corresponding authors)
- Zhenbo Qiao, Qirui Tian, Zhenlu Qin, **Jinzhen Wang**, Qing Liu, Norbert Podhorszki, Scott Klasky, Hongjian Zhu, Tango: A Cross-layer Approach to Managing I/O Interference over Local Ephemeral Storage, *SC24: International Conference for High Performance Computing, Networking, Storage and Analysis*, 2024.
- Wenqi Jia, Youyuan Liu, Zhewen Hu, **Jinzhen Wang**, Boyuan Zhang, Wei Niu, Junzhou Huang, Stavros Kalafatis, Sian Jin, Miao Yin, NeurLZ: On Systematically Enhancing Lossy Compression Performance for Scientific Data based on Neural Learning with Error Control, *arXiv preprint arXiv:2409.05785* (2024).
- Wenqi Jia, Sian Jin, **Jinzhen Wang**, Wei Niu, Dingwen Tao, Miao Yin, GWLZ: A Group-wise Learning-based Lossy Compression Framework for Scientific Data, *Proceedings of the 14th Workshop on AI and Scientific Computing at Scale using Flexible Computing Infrastructures*. 2024.
- **Jinzhen Wang**, Xin Liang, Ben Whitney, Jieyang Chen, Qian Gong, Xubin He, Lipeng Wan, Scott Klasky, Norbert Podhorszki, Qing Liu, Improving Progressive Retrieval for HPC Scientific Data using Deep Neural Network, *2023 IEEE 39th International Conference on Data Engineering (ICDE)*, 2023.
- **Jinzhen Wang**, Qi Chen, Tong Liu, Qing Liu, Xubin He, zPerf: A Statistical Gray-box Approach to Performance Modeling and Extrapolation for Scientific Lossy Compression, *IEEE Transactions on Computers*, 2023.
- **Jinzhen Wang**, Pascal Grosset, Terece L Turton, James Ahrens, Analyzing the Impact of Lossy Data Reduction on Volume Rendering of Cosmology Data, *2022 IEEE/ACM 8th International Workshop on Data Analysis and Reduction for Big Scientific Data (DRBSD-8)*, 2022.
- Nan Wang, Tong Liu, **Jinzhen Wang**, Qing Liu, Shakeel Alibhai, Xubin He, Locality-based transfer learning on compression autoencoder for efficient scientific data lossy compression, *Journal of Network and Computer Applications*, 2022.
- Xinying Wang, Lipeng Wan, Jieyang Chen, Qian Gong, Ben Whitney, **Jinzhen Wang**, Ana Gainaru, Qing Liu, Norbert Podhorszki, Dongfang Zhao, Feng Yan, Scott Klasky, Unbalanced Parallel I/O: An Often-Neglected Side Effect of Lossy Scientific Data Compression, *2021 7th International Workshop on Data Analysis and Reduction for Big Scientific Data (DRBSD-7)*, 2021.
- Tong Liu, Shakeel Alibhai, **Jinzhen Wang**, Qing Liu, Xubin He, Reducing the Training Overhead of the HPC Compression Autoencoder via Dataset Proportioning, *2021 IEEE International Conference on Networking, Architecture and Storage (NAS)*, 2021.
- Tong Liu, **Jinzhen Wang**, Qing Liu, Shakeel Alibhai, Tao Lu, Xubin He, High-ratio lossy compression: Exploring the autoencoder to compress scientific data, *IEEE Transactions on Big Data*, 2021.
- Zhenlu Qin, **Jinzhen Wang**, Qing Liu, Jieyang Chen, Dave Pugmire, Norbert Podhorszki, Scott Klasky, Estimating Lossy Compressibility of Scientific Data Using Deep Neural Networks, *IEEE Letters of the Computer Society*, 2020.

- Huizhang Luo, Dan Huang, Qing Liu, Zhenbo Qiao, Hong Jiang, Jing Bi, Haitao Yuan, Mengchu Zhou, **Jinzhen Wang**, Zhenlu Qin, Identifying Latent Reduced Models to Precondition Lossy Compression, *2019 IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, 2019.
- Zhenbo Qiao, Tao Lu, Huizhang Luo, Qing Liu, Scott Klasky, Norbert Podhorszki, **Jinzhen Wang**, SIRIUS: Enabling Progressive Data Exploration for Extreme-Scale Scientific Data, *IEEE Transactions on Multi-Scale Computing Systems*, 2018.
- Huizhang Luo, Qing Liu, Zhenbo Qiao, **Jinzhen Wang**, Mengxiao Wang, Hong Jiang, DuoModel: Leveraging Reduced Model for Data Reduction and Re-Computation on HPC Storage, *IEEE Letters of the Computer Society*, 2018.

TALKS

- 12/2024, presentation, QualityNet: Error-bounded Lossy Compression Quality Prediction via Deep Surrogate, 2024 IEEE International Conference on Big Data, Washington DC, USA.
- 10/2024, invited talk, Towards Smart and Scalable Scientific Data Management, University of North Carolina at Greensboro, NC, USA.
- 09/2024, presentation, A Generic Performance Metric for Scientific Data Compression, The 1st International Workshop on Near Real-time Data Processing for Interconnected Scientific Instruments, Osaka Senri, Japan.(virtual)
- 04/2023, presentation, Improving Progressive Retrieval for HPC Scientific Data using Deep Neural Network, 2023 IEEE 39th International Conference on Data Engineering, Anaheim, CA, USA.
- 11/2022, presentation, Analyzing the Impact of Lossy Data Reduction on Volume Rendering of Cosmology Data, 2022 IEEE/ACM 8th International Workshop on Data Analysis and Reduction for Big Scientific Data, Dallas, TX, USA.
- 05/2019, presentation, Identifying Latent Reduced Models to Precondition Lossy Compression, 2019 IEEE International Parallel and Distributed Processing Symposium, Rio de Janeiro, Brazil.

SERVICES

Research student mentor

- Khondoker Mumenin (Ph.D., Sep 2024 -)
- Jiaxiang Zhang (Ph.D., Sep 2025 -)
- Aagat Pokhrel (Ph. D., Sep 2026 -)
- Lakshmi Deepak Chidagam (M.S., Feb 206 -)
- Raivat Alwar (M.S., thesis advisor, graduated in May 2025)

Dissertation proposal committee member

- Nan Huang (advised by Prof. Xiang Zhang)

PhD qualifying exam committee member

- Nicholas Cassarino (advised by Prof. Erik Saule)

Panelist

- NSF Panel 2024
- DOE Panel 2024

Organization committee member

- The 1st International Workshop on Near Real-time Data Processing for Interconnected Scientific Instruments (NRDPISI-1)
- The 2nd International Workshop on Near Real-time Data Processing for Interconnected Scientific Instruments (NRDPISI-2)

Journal reviewer

- Nature Machine Intelligence
- The Journal of Supercomputing
- IEEE Internet of Things Journal
- IEEE Transactions on Smart Grid
- Journal of Parallel and Distributed Computing
- IEEE Transactions on Mobile Computing

Conference reviewer

- SDM 2024
- ICDE [2022-2025]
- CCGrid 2024
- ICPP 2024 (Poster)
- ICC 2026 (workshop)
- SCA/HPCAsia 2026
- MLSys 2026