

Jinzhen Wang

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BIO

My research focuses on enhancing the ecosystem for scientific data management on High-performance Computing (HPC) systems. In particular, I aim to 1) develop reliable data compression algorithms that effectively reduce the volume of scientific data while maintaining the integrity and quality of the information; 2) design data-adaptive progressive retrieval frameworks that intelligently reconstruct scientific data by trading off the computation overhead and accuracy; 3) create efficient data management middlewares that can support diverse scientific applications on HPC.

RESEARCH INTEREST

Data Compression, Scientific Data Management, Machine Learning, Scientific Visualization

WORK EXPERIENCE

Assistant Professor of Computer and Information Science **Sep 2023 —**
Brooklyn College of CUNY Brooklyn, New York, US

Graduate research intern **Sep 2022 — May 2023**
Los Alamos National Laboratory Los Alamos, New Mexico, US

Explore the impact of lossy data compression on various volume rendering techniques as well as color modes. Design a user study on the users' feedback on the image quality.

Summer research intern **May 2022 — Aug 2022**
Los Alamos National Laboratory Los Alamos, New Mexico, US

TEACHING EXPERIENCE

[BC-CUNY] CISC-1050: Intro to Computer Applications Fall 2023

[NJIT] ECE-394: Digital Systems Laboratory Spring 2019

[NJIT] ECE-394: Digital Systems Laboratory Fall 2018

EDUCATION

Ph.D. in Electrical Engineering
New Jersey Institute of Technology, NJ, US Jan 2018 - Aug 2023

M.S. in Electrical Engineering
New Jersey Institute of Technology, NJ, US Sep 2015 - May 2017

B.S. in Internet of Things (Electrical Engineering)
Shandong University, China Sep 2011 - May 2015

PUBLICATIONS (C: CONFERENCE PAPERS; J: JOURNAL PAPERS; W: WORKSHOP PAPERS)

- [C4] **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.
- [J7] **Jinzhen Wang**, Qi Chen, Tong Liu, Qing Liu, Xubin He, *zPerf: A Statistical Gray-box Approach to*

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Performance Modeling and Extrapolation for Scientific Lossy Compression, IEEE Transactions on Computers, 2023.

- [W2] **Jinzheng 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.
- [J6] Nan Wang, Tong Liu, **Jinzheng 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.
- [W1] Xinying Wang, Lipeng Wan, Jieyang Chen, Qian Gong, Ben Whitney, **Jinzheng 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.
- [C3] Tong Liu, Shakeel Alibhai, **Jinzheng 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.
- [J5] Tong Liu, **Jinzheng 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.
- [J4] Zhenlu Qin, **Jinzheng 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.
- [J3] **Jinzheng Wang**, Tong Liu, Qing Liu, Xubin He, Huizhang Luo, Weiming He, *Compression ratio modeling and estimation across error bounds for lossy compression*, IEEE Transactions on Parallel and Distributed Systems, 2019.
- [C2] Tong Liu, Shakeel Alibhai, **Jinzheng Wang**, Qing Liu, Xubin He, Chentao Wu, *Exploring Transfer Learning to Reduce Training Overhead of HPC Data in Machine Learning*, 2019 IEEE International Conference on Networking, Architecture and Storage (NAS), 2019.
- [C1] Huizhang Luo, Dan Huang, Qing Liu, Zhenbo Qiao, Hong Jiang, Jing Bi, Haitao Yuan, Mengchu Zhou, **Jinzheng Wang**, Zhenlu Qin, *Identifying Latent Reduced Models to Precondition Lossy Compression*, 2019 IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2019.
- [J2] Zhenbo Qiao, Tao Lu, Huizhang Luo, Qing Liu, Scott Klasky, Norbert Podhorszki, **Jinzheng Wang**, *SIRIUS: Enabling Progressive Data Exploration for Extreme-Scale Scientific Data*, IEEE Transactions on Multi-Scale Computing Systems, 2018.
- [J1] Huizhang Luo, Qing Liu, Zhenbo Qiao, **Jinzheng 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.

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PROFESSIONAL ACTIVITIES

Reviewer for:

- SIAM International Conference on Data Mining 2023
- IEEE International Conference on Data Engineering 2022
- IEEE Internet of Things Journal 2022
- IEEE Transactions on Smart Grid 2020