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 Interests

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

Work Experience

Assistant Professor — **Sep 2023 — current**
Brooklyn College of CUNY — *Brooklyn, New York, US*

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

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

Teaching Experience

Brooklyn College

[Instructor] CISC-1050: Intro to Computer Applications — Fall 2023

New Jersey Institute of Technology

[Instructor] ECE-394: Digital Systems Laboratory — Spring 2019
[Instructor] ECE-394: Digital Systems Laboratory — Fall 2018
[TA] ECE-698: Computer Architecture — Spring 2023
[TA] ECE-788: Computational Intelligence — Fall 2022
[TA] ECE-698: Computer Architecture — Spring 2022
[TA] ECE-698: Computer Architecture — Spring 2018

Education

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

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

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

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Publications (C: conference; J: journal; W: workshop)

- **[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 Performance Modeling and Extrapolation for Scientific Lossy Compression*, IEEE Transactions on Computers, 2023.
- **[W2] 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.
- **[J6]** 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.
- **[W1]** 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.
- **[C3]** 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.
- **[J5]** 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.
- **[J4]** 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.
- **[J3] Jinzhen 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, **Jinzhen 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, **Jinzhen 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, **Jinzhen Wang**, *SIRIUS: Enabling Progressive Data Exploration for Extreme-Scale Scientific Data*, IEEE Transactions on Multi-Scale Computing Systems, 2018.

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- **[J1]** 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.

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