PU JIAO

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Lexington, KY, United States

RESEARCH INTERESTS

High-Performance Computing Scientific Data Management, Analysis, and Reduction Deep Learning in High-Performance Computing and Data Compression

EDUCATION

- **University of Kentucky** *Expected May 2026*
  Ph.D. in Computer Science Lexington, KY
- **Missouri University of Science and Technology**
  M.S. in Civil Engineering Rolla, MO
- **Institute of Engineering Mechanics, China Earthquake Administration**
  M.Eng. in Structural Engineering Harbin, China
- **Xi'an Jiaotong University**
  B.Eng. in Civil Engineering Xi'an, China

EXPERIENCE

- **University of Kentucky** Lexington, KY
  - Research Assistant, Computer Science Department (August 2022 - December 2024)
  - Teaching Assistant, Computer Science Department (January 2025 - Present)
    - CS216: Intro to Software Engineering Techniques; received "Excellent" ratings and 4.1-4.4/5 student evaluations

- **Missouri University of Science and Technology**
  - Research Assistant, Computer Science Department (January 2022 - July 2022)
  - Research Assistant, Civil Engineering Department (September 2019 - December 2021)

SELECTED PUBLICATIONS

First-Author and Co-First-Author Publications:

1. Liu, Jinyang*, **Jiao, Pu***, Zhao, Kai, Liang, Xin, Di, Sheng, Cappello, Franck (2025). **QPET: A Versatile and Portable Quantity-of-Interest-Preservation Framework for Error-Bounded Lossy Compression**. *Proceedings of the VLDB Endowment*, Vol. 18. 2025. (To appear) (*Equal contribution)

2. **Jiao, Pu**, Di, Sheng, Xia, Mingze, Wu, Xuan, Liu, Jinyang, Liang, Xin, Cappello, Franck (2025). **Improving the Efficiency of Interpolation-Based Scientific Data Compressors with Adaptive Quantization Index Prediction**. In *2025 IEEE International Parallel and Distributed Processing Symposium (IPDPS)*. IEEE. 2025. (To appear)

3. **Jiao, Pu**, Di, Sheng, Liu, Jinyang, Liang, Xin, Cappello, Franck (2023). Characterization and Detection of Artifacts for Error-Controlled Lossy Compressors. In *2023 IEEE 30th International Conference on High Performance Computing, Data, and Analytics (HiPC)*, pp. 117-126. IEEE. December 2023, Goa, India. DOI: 10.1109/HiPC58850.2023.00027

4. **Jiao, Pu**, Di, Sheng, Guo, Hanqi, Zhao, Kai, Tian, Jiannan, Tao, Dingwen, Liang, Xin, Cappello, Franck (2022). Toward Quantity-of-Interest Preserving Lossy Compression for Scientific Data. *Proceedings of the VLDB Endowment*, Vol. 16, Issue 4, pp. 697-710. DOI: 10.14778/3574245.3574264

Co-Author Publications:

1. Wu, Xuan, Di, Sheng, Ren, Congrong, **Jiao, Pu**, Xia, Mingze, Wang, Cheng, Guo, Hanqi, Liang, Xin, Cappello, Franck (2025). **Enabling Efficient Error-controlled Lossy Compression for Unstructured Scientific Data**. In *2025 IEEE International Parallel and Distributed Processing Symposium (IPDPS)*. IEEE. 2025. (To appear)

2. Xia, Mingze, Wang, Bei, Li, Yuxiao, **Jiao, Pu**, Liang, Xin, Guo, Hanqi (2025). TspSZ: An Efficient Parallel Error-Bounded Lossy Compressor for Topological Skeleton Preservation. In *2025 IEEE 41st International Conference on Data Engineering (ICDE)*, pp. 3682-3695. IEEE. May 2025. DOI: 10.1109/ICDE65448.2025.00275

3. Xia, Mingze, Di, Sheng, Cappello, Franck, **Jiao, Pu**, Zhao, Kai, Liu, Jinyang, Wu, Xuan, Liang, Xin, Guo, Hanqi (2024). Preserving Topological Feature with Sign-of-Determinant Predicates in Lossy Compression: A Case Study of Vector Field Critical Points. In *2024 IEEE 40th International Conference on Data Engineering (ICDE)*, pp. 4979-4992. IEEE. May 2024. DOI: 10.1109/ICDE60146.2024.00378

4. Ma, Pengfei, Li, Jiaoli, Zhuo, Ying, **Jiao, Pu**, Chen, Genda (2023). Coating Condition Detection and Assessment on the Steel Girder of a Bridge through Hyperspectral Imaging. *Coatings*, Vol. 13, Issue 6, pp. 1008. DOI: 10.3390/coatings13061008

5. Yuan, Xinzhe, Chen, Genda, **Jiao, Pu**, Li, Liujun, Han, Jun, Zhang, Haibin (2022). **A neural network-based multivariate seismic classifier for simultaneous post-earthquake fragility estimation and damage classification**. *Engineering Structures*, Vol. 255, pp. 113918. DOI: 10.1016/j.engstruct.2022.113918

6. Yuan, Xinzhe, Tanksley, Dustin, **Jiao, Pu**, Li, Liujun, Chen, Genda, Wunsch, Donald (2021). **Encoding time-series ground motions as images for convolutional neural networks-based seismic damage evaluation**. *Frontiers in Built Environment*, Vol. 7, pp. 660103. DOI: 10.3389/fbuil.2021.660103

SERVICE

- **Reviewer:** IEEE Transactions on Parallel and Distributed Systems (TPDS)
- **Conference Volunteer:** Student Volunteer, SC25 (The International Conference for High Performance Computing, Networking, Storage, and Analysis)

SKILLS

- **Programming Languages:** C++, Python, JavaScript, SQL, R, MATLAB
- **High-Performance Computing:** MPI, OpenMP, CUDA, parallel algorithms, scientific computing
- **Build Systems & Tools:** CMake, Spack, Git, Linux/Unix systems
- **Data Science & Analysis:** NumPy, Pandas, SciPy, Matplotlib, scikit-learn
- **Databases:** MongoDB, MySQL, SQLite
- **Compression Technologies:** SZ2.1, SZ3, SZx, FPZIP, ZFP, lossy compression algorithms
- **Simulation Software:** OpenSees, CFD, ANSYS, structural analysis tools
- **Research Methodologies:** Algorithm design, performance optimization, artifact detection, experimental validation

ADDITIONAL INFORMATION

Languages: English (Fluent), Chinese (Native)
Interests: High-performance computing, scientific data compression, UAV technology, structural engineering