

JIEFENG ZHOU

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EDUCATION

University of South Florida (USF), Tampa, FL, U.S. 08/2025–12/2030 (expected)

Ph.D. Student in *Computer Science and Engineering*

Bellini College of Artificial Intelligence, Cybersecurity and Computing | GPA: 3.83/4.00

Advisor: Prof. Jiajun Huang

Research interests: HPC and systems for AI, collective communication, lossy compression, GPU computing

University of Electronic Science and Technology of China (UESTC), Chengdu, China 09/2021–06/2025

B.S. in *Mathematics-Physics Fundamental Science*

Yingcai Honors College | GPA: 3.88/4.00

Research advisor: Prof. Yong Deng

Research interests: evidence theory, information entropy

PUBLICATIONS

Conference Papers

- ♦ **Zhou, J.**, Di, S., Cappello, F., & Huang, J. (accepted). MAZ: Advancing the ratio-throughput frontier with multi-dimensional adaptive compression. In *Proceedings of the ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming (PPoPP '27)*. Association for Computing Machinery.
- ♦ **Zhou, J.**, Di, S., Guo, Y., Guo, Y., Zhang, L., Zhao, K., Thakur, R., Cappello, F., & Huang, J. (accepted). hZCCL2: Co-designing collective communication with vectorized homomorphic compression. In *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC '26)*. IEEE.

Journal Articles

- ♦ **Zhou, J.**, Li, Z., Cheong, K. H., & Deng, Y. (2025). Limit of the maximum random permutation set entropy. *Physica A: Statistical Mechanics and its Applications*, 664, 130425.
- ♦ Zhan, T., **Zhou, J.**, Li, Z., & Deng, Y. (2024). Generalized information entropy and generalized information dimension. *Chaos, Solitons & Fractals*, 184, 114976.
- ♦ **Zhou, J.**, Li, Z., & Deng, Y. (2024). An improved information volume of mass function based on plausibility transformation method. *Expert Systems with Applications*, 237, 121663.
- ♦ **Zhou, J.**, Li, Z., & Deng, Y. (2024). Random walk in random permutation set theory. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 34(9), 093137.

Posters

- ♦ **Zhou, J.** (2026). HV-Coll: Co-designing collective communication with vectorized homomorphic compression. ACM Student Research Competition (SRC) Poster, SC '26, Chicago, IL, USA.

In Preparation

- ♦ **Zhou, J.**, Di, S., Guo, Y., Guo, Y., Zhang, L., Zhao, K., Tu, Y., Thakur, R., Cappello, F., & Huang, J. (in preparation). ghZCCL2: High-throughput homomorphic compression with topology-aware co-design for GPU collectives.

SELECTED RESEARCH PROJECTS

hZCCL2: Collective Communication with Vectorized Homomorphic Compression SC '26

- ♦ Co-designed an AVX-512 vectorized error-bounded compressor with outlier-aware encoding and homomorphic reduction (up to $5.31\times$ faster compression than fZ-light; $8.1\times$ faster than decompress–operate–compress).
- ♦ Achieved up to $43.8\times$ Allreduce and $67.6\times$ Alltoall speedups over native MPI on 3,584 Intel Xeon Max cores, and a $39.5\times$ speedup in an image-stacking application.

MAZ: Multi-Dimensional Adaptive GPU Compression	PPoPP '27
<ul style="list-style-type: none"> Designed the first single-kernel GPU compressor with adaptive multi-order 2D/3D prediction, via a register-carried stencil state, a single-read predictor-search lattice, and a wavefront-free decoder. On an NVIDIA B200 across 79 scientific fields, improves the compression ratio of FSZ by 1.69× at comparable throughput and of cuSZp3 by 1.61×, at about 5× the throughput of the strongest-ratio baseline. 	

Industry & Research Experience	
High Performance & Intelligence Lab (π Lab), Tampa, United States	08/2025–Present
<i>Research Assistant University of South Florida Advisor: Prof. Jiajun Huang</i>	
<ul style="list-style-type: none"> First-authored hZCCL2 (SC '26) and MAZ (PPoPP '27) on compressed collectives and GPU lossy compression. Collaboration with Sheng Di's group at Argonne and with Yanfei Guo (NVIDIA). 	
Tang Lab, Chengdu, China	12/2024–07/2025
<i>Research Intern Peking University Chengdu Academy for Advanced Interdisciplinary Biotechnologies</i>	
<ul style="list-style-type: none"> Developed a language model for single-cell perturbation prediction as my undergraduate thesis project. 	
Information Fusion and Intelligent Systems Lab, Chengdu, China	02/2023–09/2024
<i>Undergraduate Research Assistant University of Electronic Science and Technology of China</i>	
<ul style="list-style-type: none"> Under Prof. Yong Deng, published four journal papers on evidence theory and information entropy (first author on three), in <i>Physica A</i>, <i>Chaos</i>, <i>Chaos, Solitons & Fractals</i>, and <i>Expert Systems with Applications</i>. 	

Awards & Honors	
<ul style="list-style-type: none"> Travel Grant SC26 ACM Student Research Competition National Grant ×3; Dream Scholarship, China Education Development Foundation (National Level) Model Student Scholarship ×2; Outstanding Undergraduate Scholarship (University Level) Top 7% The 17th IEEEExtreme Programming Competition (Global Level) First Prize The 23rd Mathematical Modeling Competition of UESTC (University Level, Top 5%) 	09/2026 2022–2024 2022–2024 12/2023 05/2023

Professional Service	
Junior Program Committee @ ACM International Conference on Supercomputing (<i>ICS 2027</i>)	12/2026
Peer Reviewer @ <i>Expert Systems with Applications</i>	11/2023