

# Dingwen Tao

*Assistant Professor*

Department of Computer Science, The University of Alabama

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## **Education**

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<b>University of California, Riverside</b>	09/2013 – 06/2018
Ph.D. in Computer Science	Riverside, CA, USA
Major Field of Study: High-Performance Computing (HPC)	
Thesis: <i>Fault Tolerance for Iterative Methods in High-Performance Computing</i>	
<b>University of Science and Technology of China</b>	09/2009 – 06/2013
B.S. in Mathematics	Hefei, Anhui, China
Major Field of Study: Information and Computing Science	

## **Academic Position**

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<b>University of Alabama, Department of Computer Science</b>	08/2018 – Present
<i>Assistant Professor</i>	Tuscaloosa, AL, USA
<b>Brookhaven National Laboratory, Computational Science Initiative</b>	01/2018 – 06/2018
<i>Research Assistant</i>	Upton, NY, USA
<b>Argonne National Laboratory, Mathematics and Computer Science Division</b>	06/2016 – 12/2017
<i>Research Assistant</i>	Lemont, IL, USA
<b>Pacific Northwest National Laboratory, High Performance Computing Group</b>	06/2015 – 09/2015
<i>Graduate Research Intern</i>	Richland, WA, USA
<b>University of California, Riverside</b>	09/2013 – 06/2016
<i>Research Assistant</i>	Riverside, CA, USA

## **Research Interest**

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- High-performance computing (HPC), cloud computing, parallel & distributed system
- Reconfigurable computing, FPGA
- Scientific data management, analytics, & visualization
- Distributed machine learning & deep learning
- Fault tolerance & resilience, energy-efficient computing
- Scientific computing & simulation, numerical algorithm & software
- Big data software stack & ecosystem

## Publication

### Selected Referred Publications (with my students underlined, \*corresponding author, AR: acceptance rate)

1. **[DAC'20]** Peiyan Dong, Siyue Wang, Wei Niu, Chengming Zhang, Sheng Lin, Zhengang Li, Yifan Gong, Bin Ren, Xue Lin, **Dingwen Tao\***. "RTMobile: Beyond Real-Time Mobile Acceleration of RNNs for Speech Recognition." In *Proceedings of the 57th Annual Design Automation Conference*, San Francisco, CA, USA, July 19 – 23, 2020.
2. **[IPDPS'20]** Sian Jin, Pascal Grosset, Christopher M. Biber, Jesus Pulido, Jiannan Tian, **Dingwen Tao\***, James Ahrens. "Understanding GPU-Based Lossy Compression for Extreme-Scale Cosmological Simulations." In *IEEE International Parallel and Distributed Symposium*, New Orleans, LA, May 18 – 22, 2020.
3. **[PPoPP'20]** Jiannan Tian, Sheng Di, Chengming Zhang, Xin Liang, Sian Jin, Dazhao Cheng, **Dingwen Tao\***, Franck Cappello. "waveSZ: A Hardware-Algorithm Co-Design of Efficient Lossy Compression for Scientific Data." In *Proceedings of ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*, San Diego, California, USA, February 22 – 26, 2020.
4. **[HPDC'19]** Sian Jin, Sheng Di, Xin Liang, Jiannan Tian, **Dingwen Tao\***, Franck Cappello. "DeepSZ: A Novel Framework to Compress Deep Neural Networks by Using Error-Bounded Lossy Compression." In *Proceedings of ACM International Symposium on High-Performance Parallel and Distributed Computing*, Phoenix, AZ, USA, June 24 – 28, 2019. (AR: 20%, 22/106)
5. **[TPDS]** **Dingwen Tao**, Sheng Di, Xin Liang, Zizhong Chen, Franck Cappello. "Optimizing Lossy Compression Rate-Distortion from Automatic Online Selection Between SZ and ZFP." *IEEE Transactions on Parallel and Distributed Systems* 30(8): 1857-1871 (2019).
6. **[JHPCA]** **Dingwen Tao**, Sheng Di, Hanqi Guo, Zizhong Chen, Franck Cappello. "Z-checker: A Framework for Assessing Lossy Compression of Scientific Data." *The International Journal of High Performance Computing Applications* 33(2) (2019).
7. **[HPDC'18]** **Dingwen Tao**, Sheng Di, Xin Liang, Zizhong Chen, Franck Cappello. "Improving Performance of Iterative Methods by Lossy Checkpointing." In *Proceedings of ACM International Symposium on High-Performance Parallel and Distributed Computing*, Tempe, AZ, USA, June 11– 15, 2018. (AR: 19%, 22/112)
8. **[Cluster'18]** Xin Liang, Sheng Di, **Dingwen Tao**, Zizhong Chen, Franck Cappello. "An Efficient Transformation Scheme for Lossy Data Compression with Point-wise Relative Error Bound." In *IEEE International Conference on Cluster Computing*, Belfast, UK, September 10 – 13, 2018. (AR: 2.6%, 4/154) **Best Area Paper Award**
9. **[Cluster'18]** Ali Murat Gok, Sheng Di, Yury Alexeev, **Dingwen Tao**, Vladimir Mironov, Franck Cappello. "PaSTRI: Error-Bounded Lossy Compression for Two-Electron Integrals in Quantum Chemistry." In *IEEE International Conference on Cluster Computing*, Belfast, UK, September 10 – 13, 2018. (AR: 0.7%, 1/154) **Best Overall Paper Award**
10. **[BigData'17]** **Dingwen Tao**, Sheng Di, Zizhong Chen, Franck Cappello. "In-Depth Exploration of Single-Snapshot Lossy Compression Techniques for N-Body Simulations." In *IEEE International Conference on Big Data*, Boston, MA, USA, December 11 – 14, 2017. (AR: 19%, 87/437)
11. **[IPDPS'17]** **Dingwen Tao**, Sheng Di, Zizhong Chen, Franck Cappello. "Significantly Improving Lossy Compression for Scientific Data Sets Based on Multidimensional Prediction and Error-Controlled Quantization." In *IEEE International Parallel and Distributed Processing Symposium*, Orlando, FL, USA, May 29 – June 2, 2017. (AR: 22%, 116/508)
12. **[HPDC'16]** **Dingwen Tao**, Shuaiwen Leon Song, Sriram Krishnamoorthy, Panruo Wu, Xin Liang, Eddy Z. Zhang, Darren Kerbyson, Zizhong Chen. "New-Sum: A Novel Online ABFT Scheme for General Iterative Methods." In *Proceedings of ACM International Symposium on High-Performance Parallel and Distributed Computing*, Kyoto, JAPAN, May 31 – June 4, 2016. (AR: 15%, 20/129)

### In Submission

1. **[ICS'20]** Jiannan Tian, Sheng Di, Kai Zhao, Sian Jin, Megan Hickman, Robert Underwood, Xin Liang, Jon Calhoun, **Dingwen Tao\***, Franck Cappello. "cuSZ: An Efficient GPU Based Error-Bounded Lossy Compression Framework for Scientific Data". In submission to the *34th ACM International Conference on Supercomputing*, Barcelona, Spain, June 29 – July 2, 2020.

**Full List of Referred Conference & Workshop Publications**

1. **[IPDPS'20]** [Sian Jin](#), Pascal Grosset, Christopher M. Biber, Jesus Pulido, [Jiannan Tian](#), **Dingwen Tao\***, and James Ahrens. "Understanding GPU-Based Lossy Compression for Extreme-Scale Cosmological Simulations." *Proceedings of IEEE International Parallel and Distributed Symposium*, New Orleans, LA, May 18 – 22, 2020.
2. **[PPoPP'20]** [Jiannan Tian](#), Sheng Di, [Chengming Zhang](#), Xin Liang, [Sian Jin](#), Dazhao Cheng, **Dingwen Tao\***, Franck Cappello. "waveSZ: A Hardware-Algorithm Co-Design of Efficient Lossy Compression for Scientific Data." *Proceedings of ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*, San Diego, California, USA, Feb 22 – 26, 2020.
3. **[HPDC'19]** [Sian Jin](#), Sheng Di, Xin Liang, [Jiannan Tian](#), **Dingwen Tao\***, Franck Cappello. "DeepSZ: A Novel Framework to Compress Deep Neural Networks by Using Error-Bounded Lossy Compression." *Proceedings of ACM International Symposium on High-Performance Parallel and Distributed Computing*, Phoenix, AZ, USA, June 24 – 28, 2019.
4. **[SC'19]** Xin Liang, Sheng Di, Sihuan Li, **Dingwen Tao**, Bogdan Nicolae, Zizhong Chen, Franck Cappello. "Significantly Improving Lossy Compression Quality based on An Optimized Hybrid Prediction Model." *Proceedings of The International Conference for High Performance Computing, Networking, Storage and Analysis*, Denver, CO, USA, Nov 17 – 22, 2019.
5. **[BigData'19]** Yuqi Fu, Shaolun Zhang, Jose Terrero, Ying Mao, Guangya Liu, Sheng Li, **Dingwen Tao**. "Progress-based Container Scheduling for Short-lived Applications in a Kubernetes Cluster." *Proceedings of IEEE International Conference on Big Data*, Los Angeles, CA, USA, December 9 – 12, 2019.
6. **[BigData'19]** Donglin Yang, Wei Rang, Dazhao Cheng, Yu Wang, [Jiannan Tian](#), **Dingwen Tao**. "Elastic Executor Provisioning for Iterative Workloads on Apache Spark." *Proceedings of IEEE International Conference on Big Data*, Los Angeles, CA, USA, December 9 – 12, 2019.
7. **[Cluster'19]** Xin Liang, Sheng Di, **Dingwen Tao**, Sihuan Li, Bogdan Nicolae, Zizhong Chen, Franck Cappello. "Improving Performance of Data Dumping with Lossy Compression for Scientific Simulation." *Proceedings of IEEE International Conference on Cluster Computing*, Albuquerque, NM, USA, September 23 – 26, 2019.
8. **[HPC'19]** Xiangyu Zou, Tao Lu, Sheng Di, **Dingwen Tao**, Wen Xia, Xuan Wang, Weizhe Zhang, Qing Liao. "Accelerating Lossy Compression on HPC datasets via Partitioning Computation for Parallel Processing." *Proceedings of IEEE International Conference on High Performance Computing and Communications*, Zhangjiajie, China, Aug 10 – 12, 2019.
9. **[ICS'19]** Jieyang Chen, Nan Xiong, Xin Liang, **Dingwen Tao**, Sihuan Li, Kaiming Ouyang, Kai Zhao, Nathan DeBardleben, Qiang Guan, Zizhong Chen. "TSM2: Optimizing Tall-and-Skinny Matrix-Matrix Multiplication on GPUs." *Proceedings of ACM International Conference on Supercomputing*, Phoenix, AZ, USA, June 26 – 28, 2019.
10. **[MSST'19]** Xiangyu Zou, Tao Lu, Wen Xia, Xuan Wang, Weizhe Zhang, Sheng Di, **Dingwen Tao**, Franck Cappello. "Accelerating Relative-error Bounded Lossy Compression for HPC datasets with Precomputation-Based Mechanisms." *Proceedings of IEEE Symposium on Mass Storage Systems and Technologies*, Santa Clara, CA, USA, May 20 – 24, 2019.
11. **[NYSDS'18]** Line Pouchard, Kevin Huck, Gyorgy Matyasfalvi, **Dingwen Tao**, Li Tang, Huub Van Dam, Shinjae Yoo. "Prescriptive Provenance for Streaming Analysis of Workflows at Scale." *Proceedings of 2018 New York Scientific Data Summit*, New York, NY, USA, August 6 – 8, 2018.
12. **[BigData'18]** Xin Liang, Sheng Di, **Dingwen Tao**, Sihuan Li, Shaomeng Li, Hanqi Guo, Zizhong Chen, Franck Cappello. "Error-Controlled Lossy Compression Optimized for High Compression Ratios of Scientific Datasets." *Proceedings of IEEE International Conference on Big Data*, Seattle, WA, USA, December 10 – 13.
13. **[Cluster'18]** **Dingwen Tao**, Sheng Di, Xin Liang, Zizhong Chen, Franck Cappello. "Design of Fixed-PSNR Lossy Compression for HPC Scientific Data." *Proceedings of IEEE International Conference on Cluster Computing*, Belfast, UK, September 10 – 13, 2018.

14. **[Cluster'18]** Xin Liang, Sheng Di, **Dingwen Tao**, Zizhong Chen, Franck Cappello. "An Efficient Transformation Scheme for Lossy Data Compression with Point-wise Relative Error Bound." *Proceedings of IEEE International Conference on Cluster Computing*, Belfast, UK, September 10 – 13, 2018. **(Best Track Paper Award)**
15. **[Cluster'18]** Ali Murat Gok, Sheng Di, Yury Alexeev, **Dingwen Tao**, Vladimir Mironov, Franck Cappello. "PaSTRI: Error-Bounded Lossy Compression for Two-Electron Integrals in Quantum Chemistry." *Proceedings of IEEE International Conference on Cluster Computing*, Belfast, UK, September 10 – 13, 2018. **(Best Overall Paper Award)**
16. **[SC'18]** Jieyang Chen, Hongbo Li, Sihuan Li, Xin Liang, Panruo Wu, **Dingwen Tao**, Kaiming Ouyang, Yuanlai Liu, Kai Zhao, Qiang Guan, Zizhong Chen. "FT-MAGMA: Fault Tolerance Dense Matrix Decomposition on Heterogeneous Systems with GPUs." *Proceedings of The International Conference for High Performance Computing, Networking, Storage and Analysis*, Dallas, TX, USA, Nov 11 – 16, 2017.
17. **[DRBSD-4]** Xin Liang, Sheng Di, **Dingwen Tao**, Sihuan Li, Zizhong Chen, Franck Cappello. "Improving In-situ Lossy Compression with Spatio-Temporal Decimation based on SZ Model." *The 4th International Workshop on Data Reduction for Big Scientific Data in Conjunction with SC'18*, Dallas, TX, USA, Nov 12 – 15, 2018.
18. **[HPDC'18]** **Dingwen Tao**, Sheng Di, Xin Liang, Zizhong Chen, Franck Cappello. "Improving Performance of Iterative Methods by Lossy Checkpointing." *Proceedings of ACM International Symposium on High-Performance Parallel and Distributed Computing*, Tempe, AZ, USA, June 11– 15, 2018.
19. **[BigData'17]** **Dingwen Tao**, Sheng Di, Zizhong Chen, Franck Cappello. "In-Depth Exploration of Single-Snapshot Lossy Compression Techniques for N-Body Simulations." *Proceedings of IEEE International Conference on Big Data*, Boston, MA, USA, December 11 – 14, 2017.
20. **[SC'17]** Xin Liang, Jieyang Chen, **Dingwen Tao**, Sihuan Li, Panruo Wu, Hongbo Li, Kaiming Ouyang, Yuanlai Liu, Fengguang Song, Zizhong Chen. "Correcting Soft Errors Online in Fast Fourier Transform." *Proceedings of The International Conference for High Performance Computing, Networking, Storage and Analysis*, Denver, CO, USA, Nov 12 – 17, 2017.
21. **[DRBSD-2]** Sheng Di, **Dingwen Tao**, Franck Cappello. "An Efficient Approach to Lossy Compression with Pointwise Relative Error Bound." *The 2nd International Workshop on Data Reduction for Big Scientific Data in Conjunction with SC'17*, Denver, CO, USA, Nov 12 – 17, 2017.
22. **[EuroPar'17]** Ian Foster, Mark Ainsworth, Bryce Allen, Julie Bessac, Franck Cappello, Jong Youl Choi, Emil Constantinescu, Philip E Davis, Sheng Di, Wendy Di, Hanqi Guo, Scott Klasky, Kerstin Kleese Van Dam, Tahsin Kurc, Qing Liu, Abid Malik, Kshitij Mehta, Klaus Mueller, Todd Munson, George Ostouchov, Manish Parashar, Tom Peterka, Line Pouchard, **Dingwen Tao**, Ozan Tugluk, Stefan Wild, Matthew Wolf, Justin M Wozniak, Wei Xu, Shinjae Yoo. "Computing Just What You Need: Online Data Analysis and Reduction at Extreme Scales." *Proceedings of International European Conference on Parallel and Distributed Computing*, Santiago de Compostela, Spain, Aug 28 – Sept 1, 2017.
23. **[IPDPS'17]** **Dingwen Tao**, Sheng Di, Zizhong Chen, Franck Cappello. "Significantly Improving Lossy Compression for Scientific Data Sets Based on Multidimensional Prediction and Error-Controlled Quantization." *Proceedings of IEEE International Parallel & Distributed Processing Symposium*, Orlando, FL, USA, May 29 – June 2, 2017.
24. **[DRBSD-1]** **Dingwen Tao**, Sheng Di, Zizhong Chen, Franck Cappello. "Exploration of Pattern-Matching Techniques for Lossy Compression on Cosmology Simulation Data Sets." *The 1st International Workshop on Data Reduction for Big Scientific Data in Conjunction with ISC'17*, Frankfurt, Germany, June 22, 2017.
25. **[PPoPP'17]** Panruo Wu, Nathan Debardeleben, Qiang Guan, Sean Blanchard, Jieyang Chen, **Dingwen Tao**, Xin Liang, Kaiming Ouyang, Sihuan Li, Zizhong Chen. "Silent Data Corruption Resilient Two-sided Matrix Factorizations." *Proceedings of ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*, Austin, TX, USA, February 4 – 8, 2017.

26. [SC'16] Jieyang Chen, Li Tan, Panruo Wu, **Dingwen Tao**, Hongbo Li, Xin Liang, Sihuan Li, Rong Ge, Laxmi Bhuyan, Zizhong Chen. "GreenLA: Green Linear Algebra Software for GPU-Accelerated Heterogeneous Computing." *Proceedings of The International Conference for High Performance Computing, Networking, Storage and Analysis*, Salt Lake City, UT, USA.
27. [HPDC'16] **Dingwen Tao**, Shuaiwen Leon Song, Sriram Krishnamoorthy, Panruo Wu, Xin Liang, Eddy Z. Zhang, Darren Kerbyson, Zizhong Chen. "New-Sum: A Novel Online ABFT Scheme for General Iterative Methods." *Proceedings of ACM International Symposium on High-Performance Parallel and Distributed Computing*, Kyoto, JAPAN, May 31– June 4, 2016.
28. [HPDC'16] Panruo Wu, Qiang Guan, Nathan DeBardeleben, Sean Blanchard, **Dingwen Tao**, Xin Liang, Jieyang Chen, Zizhong Chen. "Towards Practical Algorithm Based Fault Tolerance in Dense Linear Algebra." *Proceedings of ACM International Symposium on High-Performance Parallel and Distributed Computing*, Kyoto, JAPAN, May 31 – June 4, 2016.
29. [ICPADS'14] Longxiang Chen, **Dingwen Tao**, Panruo, Zizhong Chen. "Extending Checksum-Based ABFT to Tolerate Soft Errors Online in Iterative Methods." *Proceedings of IEEE International Conference on Parallel and Distributed Systems, Hsinchu, Taiwan, December 16 – 19, 2014*.

### Full List of Referred Journal Publications

1. [TPDS] Xiangyu Zou, Tao Lu, Wen Xia, Xuan Wang, Weizhe Zhang, Haijun Zhang, Sheng Di, **Dingwen Tao**, Franck Cappello. "Performance Optimization for Relative-Error-Bounded Lossy Compression on Scientific Data." *IEEE Transactions on Parallel and Distributed Systems* 31(7): 1665-1680 (2020).
2. [IJHPCA] Franck Cappello, Sheng Di, Sihuan Li, Xin Liang, Ali Murat Gok, **Dingwen Tao**, Chun Hong Yoon, Xin-Chuan Wu, Yuri Alexeev, Frederic T. Chong. "Use Cases of Lossy Compression for Floating-Point Data in Scientific Datasets." *The International Journal of High Performance Computing Applications* 33(6) (2019).
3. [TPDS] **Dingwen Tao**, Sheng Di, Xin Liang, Zizhong Chen, Franck Cappello. "Optimizing Lossy Compression Rate-Distortion from Automatic Online Selection Between SZ and ZFP." *IEEE Transactions on Parallel and Distributed Systems* 30(8): 1857-1871 (2019).
4. [IJHPCA] **Dingwen Tao**, Sheng Di, Hanqi Guo, Zizhong Chen, Franck Cappello. "Z-checker: A Framework for Assessing Lossy Compression of Scientific Data." *The International Journal of High Performance Computing Applications* 33(2) (2019).
5. [TPDS] Sheng Di, **Dingwen Tao**, Xin Liang, Franck Cappello. "Efficient Lossy Compression for Scientific Data based on Pointwise Relative Error Bound." *IEEE Transactions on Parallel and Distributed Systems* 30(2): 331-345 (2019).

### Grants and Contracts

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#### Funded Projects

- 07/2019      **National Oceanic and Atmospheric Administration, Department of Commerce**  
                   **Title:** *Center for Remote Sensing of Snow and Soil Moisture*  
                   **Amount:** \$25M      **Period:** 8/1/2018 – 7/31/2023      **Role:** co-PI (PI: Prasad Gogineni)
- 06/2019      **Argonne National Laboratory, Department of Energy**  
                   **Title:** *Improving Lossy Compression for Scientific Applications at Extreme Scale*  
                   **Amount:** \$20K      **Period:** 8/15/2019 – 12/31/2019      **Role:** PI
- 11/2018      **Xilinx, Inc**  
                   **Title:** *FPGA-Enhanced Lossy Compression for Scientific Data*  
                   **Amount:** \$4,000      **Period:** 01/01/2019 – present      **Role:** PI

- 08/2018 **The University of Alabama**  
**Title:** *New Faculty Start-Up Fund*  
**Amount:** \$245K **Period:** 8/15/2018 – 8/14/2021 **Role:** PI

### Pending Grants

- 03/2019 **National Science Foundation**  
**Title:** *Collaborative Research: PPOSS: Planning: Energy Efficient Computing on Extreme-Scale Systems with Emerging Architectures and Technologies*  
**Amount:** \$60K **Period:** 9/1/2020 – 8/31/2021 **Role:** PI
- 01/2020 **National Science Foundation**  
**Title:** *CC\* Compute: Accelerating Advances in Science and Engineering at The University of Alabama Through HPC Infrastructure*  
**Amount:** \$400K **Period:** 8/15/2020 – 8/14/2022 **Role:** co-PI (PI: Jeff Carver)
- 01/2020 **National Science Foundation**  
**Title:** *CCRI: Planning: Collaborative Research: Planning to Develop Post-analysis Driven Assessment Infrastructure for Scientific Data Reduction Research Community*  
**Amount:** \$50K **Period:** 10/1/2020 – 9/30/2021 **Role:** Lead PI
- 11/2019 **National Science Foundation**  
**Title:** *Collaborative Research: Framework: Cyberinfrastructure and Hybrid Data Assimilation for Enhanced Community Based Predictive Modeling*  
**Amount:** \$2.6M **Period:** 6/1/2020 – 5/31/2024 **Role:** co-PI (PI: Hamid Moradkhani)
- 10/2019 **National Science Foundation**  
**Title:** *CDS&E: Collaborative Research: HyLoC: Objective-driven Adaptive Hybrid Lossy Compression Framework for Extreme-Scale Scientific Applications*  
**Amount:** \$270K **Period:** 6/1/2020 – 5/31/2023 **Role:** Lead PI
- 08/2019 **National Science Foundation**  
**Title:** *CRII: OAC: An Efficient Lossy Compression Framework for Reducing Memory Footprint for Extreme-Scale Deep Learning on GPU-Based HPC Systems*  
**Amount:** \$175K **Period:** 5/1/2020 – 4/31/2022 **Role:** Single PI  
**Program director requested abstract in March 2, 2020**

### Past Grants

- 06/2018 Student Travel Grant \$1,400, ACM HPDC'18 Award
- 11/2017 Student Travel Grant \$1,500, ACM/IEEE SC'17 Award
- 06/2017 Student Travel Grant \$250, IEEE IPDPS'17 Award
- 06/2016 Student Travel Grant \$1,000, ACM HPDC'16 Award

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**Teaching Experience**

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- CS 481/581: *High Performance Computing*, Spring 2019, Spring 2020 (UA)
- CS 470/570: *Computer Algorithms*, Fall 2019 (UA)
- CS 211: *High Performance Computing*, Fall 2014, Fall 2015 & Fall 2016 (UCR)
- CS 012: *INTRO TO CS FOR SCI, MATH&ENGR II*, Winter 2015 (UCR)
- CS 008: *Introduction to Computing*, Fall 2014 (UCR)
- CS 006: *Effective Use of the World Wide Web*, Fall 2014 (UCR)

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**Student Mentorship**

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**Doctoral Dissertation Chair**

Sian Jin (Fall 2018 – ), Jiannan Tian (Spring 2019 – ), Chengming Zhang (Fall 2019 – ), Sultan Asiri (Fall 2019 – )

**Doctoral Dissertation Committee Member**

Peyman Abbaszadeh (Spring 2019 – ), Nasir U. Eisty (Fall 2019 – ), Tasnuva Mahjabin (Fall 2019 – )

**Undergraduate Research Mentor**

Cody Rivera (Spring 2019 – ), Philip Speegle (Fall 2019 – ), Jack O'Donohue, Aashman Gupta (Summer 2019)

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**Professional Service**

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**Journal Reviewer**

- IEEE Transactions on Cloud Computing (Impact Factor: 5.967)
- IEEE Transactions on Big Data (Impact Factor: 5.670)
- IEEE Transactions on Emerging Topics in Computing (Impact Factor: 4.989)
- IEEE Access (Impact Factor: 4.098)
- IEEE Transactions on Parallel and Distributed Systems (Impact Factor: 3.402)
- SIAM Journal on Scientific Computing (Impact Factor: 2.310)
- Scientific Programming (Impact Factor: 1.289)
- Parallel Computing (Impact Factor: 1.281)
- Journal of Systems Architecture (Impact Factor: 1.159)
- Integration the VLSI Journal (Impact Factor: 1.150)

**Conference Program Committee**

- *Program co-chair* of the 21st IEEE International Conference on Scalable Computing & Communications
- *Co-chair* of International Workshop on Big Data Analytics of Cyber-Physical Systems in conjunction with 2019 IEEE International Green and Sustainable Computing (IGSC) conference
- The 49th International Conference on Parallel Processing (ICPP '20)
- The 32nd International Conference for High Performance Computing, Networking, Storage, & Analysis (SC '20)
- IEEE International Conference on Cluster Computing (Cluster '20)
- IEEE International Congress on Big Data (BigData Congress '18, '19)
- IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC '18, '19)

- Annual IFIP International Conference on Network and Parallel Computing (NPC '18, '19)
- The International Conference on Services Computing (SCC '19, '20)
- IEEE International Conference on e-Science (eScience '18)

### Conference External Reviewer

- The 30th International Conference for High Performance Computing, Networking, Storage, & Analysis (SC'18)
- The 32nd IEEE International Parallel and Distributed Processing Symposium (IPDPS'18)
- The 29th International Conference for High Performance Computing, Networking, Storage, & Analysis (SC'17)
- The 31st ACM International Conference on Supercomputing (ICS'17)
- The 26th ACM International Symposium on High-Performance Parallel & Distributed Computing (HPDC'17)
- The 31st IEEE International Parallel and Distributed Processing Symposium (IPDPS'17)
- The 22nd IEEE International Conference on Parallel and Distributed Systems (ICPADS'16)
- The 28th International Conference for High Performance Computing, Networking, Storage, & Analysis (SC'16)
- The 30th ACM International Conference on Supercomputing (ICS'16)
- The 30th IEEE International Parallel and Distributed Processing Symposium (IPDPS'16)
- The 27th International Conference for High Performance Computing, Networking, Storage, & Analysis (SC'15)
- The 24th International Conference on Parallel Architectures and Compilation Techniques (PACT'15)
- The 14th IEEE/ACM International Symposium on Cluster, Cloud & Grid Computing (CCGRID'14)

### Workshop Program Committee

- The 1st, 2nd, 3rd High-Performance Machine Learning (HPML 2018, 2019, 2020) Workshop
- The 4th Fault Tolerant Systems (FTS 2018) Workshop
- The 1st International Workshop on Large-Scale Deep Learning on Modern Heterogeneous Supercomputers

### Workshop External Reviewer

- The 10th, 11th, 12th Workshop on Resiliency in High Performance Computing (Resilience) in Clusters, Clouds, and Grids held in conjunction with the 23rd, 24th, 25th International European Conference on Parallel and Distributed Computing (Euro-Par 2017, 2018, 2019)

### Curriculum Development

- Development of *UA CS 481/581: High-Performance Computing*, which provides students with knowledge and fundamental concepts of HPC as well as hands-on experience of the core technology in the field.
- Development of *UA CS 470/570: Advanced Computer Algorithms*, which provides students the knowledge of how to construct efficient algorithms for computer implementation.

### Membership

- Association for Computing Machinery (2016 – Present)
- Institute of Electrical and Electronics Engineers (2017 – Present)



## **Honor and Awards**

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|---|-------------------------------------|------|
| • Dissertation Year Program Fellowship                                    | University of California, Riverside | 2017 |
| • Dean's Distinguished Fellowship   | University of California, Riverside | 2013 |
| • Outstanding Student Scholarship   | University of Sci. & Tech. of China | 2012 |
| • Outstanding Student Scholarship   | University of Sci. & Tech. of China | 2010 |
| • Outstanding Freshman Scholarship  | University of Sci. & Tech. of China | 2009 |
| • 1 <sup>st</sup> Prize in <i>National High School Mathematics League</i> | Anhui Province                      | 2008 |
| • 1 <sup>st</sup> Prize in <i>National Olympiad in Informatics</i>        | Anhui Province                      | 2005 |
| • 2 <sup>nd</sup> Prize in <i>National Olympiad in Informatics</i>        | Anhui Province                      | 2007 |
| • Zhao Wei Fellowship   | Anhui Province                      | 2006 |

## **Invited Talk**

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- “*Scientific Data Reduction Challenges in the Era of Exascale Computing*”, Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA, December 2019.
- “*Keeping-up with Scientific Data Explosion in the Era of Exascale Computing*”, Boston University, Boston, Massachusetts, USA, November 2019.
- “*Keeping-up with Scientific Data Explosion in the Era of Exascale Computing*”, Northeastern University, Boston, Massachusetts, USA, October 2019.
- “*Keeping-up with Scientific Data Explosion in the Era of Exascale Computing*”, University of California, Merced, California, USA, October 2019.
- “*High-Performance Computing at Extreme Scale: Keeping-up with Scientific Data Explosion*”, Los Alamos National Laboratory, Los Alamos, New Mexico, USA, July 2019.
- “*High-Performance Computing at Extreme Scale: Keeping-up with Flood of Scientific Data*”, College of Information Science and Engineering, Beijing, China, June 2019.
- “*High-Performance Computing at Extreme Scale: Data Reduction, Resilience, Scalability*”, Institute of Computing Technology (ICT), Chinese Academy of Sciences (CAS), Beijing, China, October 2018.
- “*High-Performance Computing at Extreme Scale: Data Reduction, Resilience, Scalability*”, College of Software Engineering, Tsinghua University, Beijing, China, October 2018.
- “*GreenLA: Energy Efficient Linear Algebra Software for GPU-Accelerated Heterogeneous Computing*”, Energy-Efficient Computing Workshop, HPC China 2018, Qingdao, China, September 2018.

## **Selected Software**

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- **Foresight**: A Compression Benchmark Suite for Visualization and Analysis of Simulation Data
- **DeepSZ**: Lossy Compression Framework for Deep Neural Networks
- **SZ**: Fast, Effective, Parallel Error-bounded Exascale Scientific Data Lossy Compressor
- **Z-checker**: Exascale Scientific Data Analysis and Lossy Compression Assessment Library
- **LossyCR**: Lossy Checkpointing Library for Large-scale Supercomputers
- **GreenLA**: Energy Efficient Linear Algebra Software for GPU-accelerated Heterogeneous Computing

**Professional Reference**

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Dr. Zizhong Chen

Professor, University of California, Riverside

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