

Zheqi Shen

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EDUCATION

University of California, Riverside (UCR)

Riverside, CA

Doctor of Philosophy in Computer Science, advised by Yan Gu

Sept. 2020 – Present

ShanghaiTech University (ShanghaiTech)

Shanghai, China

Bachelor of Engineering in Computer Science and Technology

Sept. 2016 – Jun. 2020

2018–2019 ShanghaiTech University Outstanding Student Awards

2016–2017 ShanghaiTech University Outstanding Student Scholarship

RESEARCH INTERESTS

Parallel algorithm design and analysis

Approximate nearest neighbor (ANN) search

RESEARCH EXPERIENCE

UCR | Parallel Algorithm Lab

Riverside, CA

Researcher with Professor Yan Gu

Sept. 2020 – Present

- Exploited cutting-edge ANN techniques and built extensive high-performance ANN systems
- Designed and implemented efficient parallel algorithms at large scales and novel data structures
- Designed methods to parallelize iterative algorithms and metrics to analyze parallel programs

University of Maryland | ParAlg Lab

College Park, MD

Visitor with Professor Laxman Dhulipala

Summer 2022

- Integrated HNSW, a widely used ANN algorithm, with CPAM, a state-of-the-art graph container built on the cache-efficient tree embedding
- Developed functional updates and snapshots for graph-based ANN algorithms

ShanghaiTech | Laboratory of I/O System and Data Science

Shanghai, China

Undergraduate Researcher with Professor Shu Yin

Sept. 2018 – Jun. 2020

- Designed an application-transparent intermediate layer with a special cache-replacement scheme, reducing I/O load and improving lowest frame rate for computer vision applications

PUBLICATIONS

- **Pkd-tree: Parallel kd-tree with Batch Updates**
Ziyang Men, *Zheqi Shen*, Yan Gu, and Yihan Sun. (SIGMOD'25)
- **BYO: A Unified Framework for Benchmarking Large-Scale Graph Containers**
Brian Wheatman, Xiaojun Dong, *Zheqi Shen*, Laxman Dhulipala, Jakub Lacki, Prashant Pandey, and Helen Xu. (VLDB'24)
- **ParANN: Scalable and Deterministic Parallel Graph-Based Algorithms for Approximate Nearest Neighbor Search**
Magdalen Dobson, *Zheqi Shen*, Guy E. Blelloch, Laxman Dhulipala, Yan Gu, Harsha Vardhan Simhadri, and Yihan Sun. (PPoPP'24)
- **Parallel longest increasing subsequence and van emde boas trees**
Yan Gu, Ziyang Men, *Zheqi Shen*, Yihan Sun, and Zijin Wan. (SPAA'23)
- **Many sequential iterative algorithms can be parallel and (nearly) work-efficient**
Zheqi Shen, Zijin Wan, Yan Gu, and Yihan Sun. (SPAA'22)

PRESENTATIONS

- **Techniques and Challenges Towards Better Approximate Nearest Neighbor Search**
Zheqi Shen (Invited lecture at ShanghaiTech, 2024)
- **Advanced Algorithms: High-dimensional Nearest Neighbor Search**
Zheqi Shen (Guest lecture at UCR CS219, Fall 2023)
- **Approximate Nearest Neighbor Search (ANNS): Techniques and Open Problems**
Magdalen Dobson, *Zheqi Shen*, Laxman Dhulipala, Harsha Vardhan Simhadri. (Workshop at SPAA '23)

TEACHING EXPERIENCE

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|---|--------------------|
| Teaching Assistant for Algorithm Engineering (UCR CS142) | <i>Winter 2023</i> |
| Teaching Assistant for Design and Analysis of Algorithms (UCR CS218) | <i>Fall 2022</i> |
| Teaching Assistant for Design and Analysis of Algorithms (UCR CS218) | <i>Spring 2022</i> |
| Teaching Assistant for Algorithm Engineering (UCR CS142) | <i>Winter 2022</i> |
| Teaching Assistant for Design and Analysis of Algorithms (UCR CS218) | <i>Fall 2021</i> |
| Teaching Assistant for Computer Architecture I (ShanghaiTech CS110) | <i>Spring 2019</i> |
| Teaching Assistant for Foundational of Algorithm (ShanghaiTech CS140) | <i>Fall 2018</i> |
| Student Assistant in Teaching Affairs Office (ShanghaiTech) | <i>2016–2018</i> |

COMMUNITY SERVICE

I am serving as a artifact-evaluation committee member on

- ACM SIGMOD 2024 Availability and Reproducibility Committee

I have served as a reviewer for the following conferences and journals:

- ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP 2025)
- IEEE International Conference on High Performance Computing (HiPC 2024)
- Symposium on Algorithm Engineering and Experiments (ALENEX 2024)
- ACM Transactions on Parallel Computing (TOPC 2023)
- ACM Symposium on Parallelism in Algorithms and Architectures (SPAA 2023)
- European Symposium on Algorithms (ESA 2023)
- International European Conference on Parallel and Distributed Computing (Euro-Par 2022)

I have served as an artifact reviewer for the following conference:

- ALENEX 2025 Artifact Evaluation (committee member)
- ACM SIGMOD ARI 2023 (shepherd)

I have participated in organizing UC Riverside Programming Challenges (UCRPC 2021–2024)

COMPETITION ACHIEVEMENTS

SC19 Student Cluster Competition *2019*

- Planned the cluster configuration to best match the computing scenarios
- Designed a schema to efficiently manage all CPU/GPU resource and fine-tune the power consumption
- Proposed the optimal solution in the structural simulation problems

Silver Prize | ASC Student Supercomputer Challenge *2018*

- Optimized RELION, the core application in cryo-EM technology, and adapted it onto GPU cards
- Obtained the highest scores in this single item with over 2.8x speedup
- Tuned the performance of CFL3D and achieved 25.6% performance improvement

Fourth & Fan Favorite Prize | ISC Student Cluster Competition *2018*

- Profiled and optimized the scientific application, Nektar++;
- Achieved better CPU utilization by analyzing the solver code and rewriting critical loops
- Fine-tuned MPI configurations to reduce the communication overhead