

ZIRUI ZHANG

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West Lafayette, Indiana, 47906

EDUCATION

Bachelor of Science, Computer Science – Concentration in Computer Graphics

Purdue University | GPA: 3.64 | Aug 2021 – May 2025

Relevant Coursework: Data Structure and Algorithms, Computer Architecture, System Programming, Computer Graphics, Artificial Intelligence, Data Mining & Machine Learning, VR & AR, Discrete Mathematics, Numerical Methods, Linear Algebra.

AWARDS AND DISTINCTIONS

- **1st Place**, MIT iQuHACK Hackathon – QuEra, 2024
- **IQ-PARC Quantum Research Scholarship**, 2022-2023
- **DoD STEM Exchange Conference Speaker**, 2023
- **Dean's List & Semester Honors**, 2021-2024

EMPLOYMENT

Undergraduate Research Assistant | Sept 2023 – Current

Purdue University – Department of Computer Science

- Assistant to Professor Voicu Popescu, completed IRB training and conducted 3 user study research, with data analysis presented in conference technical paper.

Teaching Assistant | Aug 2022 – Current

Purdue University – School of Electrical and Computer Engineering

- Publication: Dongyang Li, Priyam Gupta, Yi Lin Yang, Eric Christopher Broyles, Lakshay Goel, **Zirui Zhang**, C. Robert Kenley. Developing an Undergraduate Quantum Workforce. *IEEE International Conference on Quantum Computing and Engineering (QCE24)*.
- Designed course content on quantum computation for students from undergrad to graduate levels while providing mentorship and guidance to student-led projects with publications.
- Host of Qiskit Fall Fest 2023 at Purdue University, an educational event on quantum computation and technologies, sponsored by IBM, IQ-PARC, and Quantum Science Center.
- Presented *Hands-on Quantum Programming: The Student Experience* at Department of Defense STEM Exchange 2023.

Teaching Assistant | May 2024 – Current

Northwestern University – McCormick School of Engineering

- Publication: Dongyang Li, **Zirui Zhang**, Xinzhe Xu, Mahdi Hosseini. Quantum Game Club: Engaging with Quantum Computing Through Interactive Learning. *IEEE International Conference on Quantum Computing and Engineering (QCE24)*.
- Hosted quantum computation summer school aimed at k-12 through graduate level students, providing insights to industry and applications of quantum computing.
- Speaker at *Northwestern Quantum Summer School 2024*, presenting *Quantum Game Club Hands-on Quantum Programming*.

RESEARCH EXPERIENCE

MIS Inspired Dataset Reductions with Neutral Atom Quantum Computers | Aug 2024 – Nov 2024

Advised by David Bernal Neira

- Publication: **Zirui Zhang**, Pravin Mahendran, Kevin Zhang, David Bernal Neira. Maximum Independent Set Inspired Dataset Reductions with Neutral Atom Quantum Computers. Submitted to *6th International Workshop on Quantum Software Engineering (Q-SE 2025)*.
- Applied Maximum Independent Set with Rydberg atom arrays, utilizing greedy heuristic for post-processing, Reducing similar data points in a dataset for machine learning training optimization.

Towards Quantum AdaBoost Weight Initialization | Aug 2024 – Nov 2024

Advised by David Bernal Neira

- Publication: **Zirui Zhang**, Kevin Zhang, Pravin Mahendran, David Bernal Neira. Towards Quantum AdaBoost Weight Initialization. Submitted to *6th International Workshop on Quantum Software Engineering (Q-SE 2025)*.
- Utilized lattice probability distribution as initial weights for Adaboost to enhance machine learning model performance and convergence rate.

XRXL: A System for Immersive Visualization in Large Lectures | Sept 2023 – Sept 2024

Advised by Voicu Popescu

- Publication: Kabir Batra, **Zirui Zhang**, Shuwen Yang, Arnima Agrawal, Yiyin Gu, Bedrich Benes, Alejandra Magana, Voicu Popescu. XRXL: A System for Immersive Visualization in Large Lectures. *2025 IEEE Virtual Reality and 3D User Interfaces (IEEE VR 2025)*.
- Designed and developed interactive user interface capable of seamlessly transitioning between a traditional computer-based environment and a fully immersive 3D virtual reality experience.
- Created scalable system capable of simultaneously hosting large number of students, providing each with unique, interactable 3D models.

Complex Virtual Environments Through Continuous Visibility Computation | Mar 2024 – Sept 2024

Advised by Voicu Popescu

- Publication: Voicu Popescu, Elisha Sacks, **Zirui Zhang**, Jorge Vazquez. Complex Virtual Environments Through Continuous Visibility Computation. *2025 IEEE Virtual Reality and 3D User Interfaces (IEEE VR 2025)*.
- Developed real-time benchmark used to validate visibility computation with less than 0.1% error, suitable for multiple VR hardware platforms.

PERSONAL PROJECTS

Procedural Generation with Quantum Optimization | Nov 2023 – April 2024

System for procedural content generation using quantum computers

- Publication: **Zirui Zhang**, Shannon Cheng, Kevin Xiao, Priyam Gupta, Sean Ruda. Towards Wave Function Collapse using Optimization with Quantum Algorithms. *The 17th ACM SIGGRAPH Conference and Exhibition on Computer Graphics and Interactive Techniques in Asia (SIGGRAPH ASIA)*.
- Implemented wave function collapse algorithm on quantum computers to achieve procedural content generation via constraint optimization.
- Created system for general case wave function collapse for n-dimensional procedural content generation while bypassing qubit limit with batch generation.