

# Ziqing Guo

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## Education

Texas Tech University, PhD, High Performance Computing Center Fellow	July 2026 (expected)
Newcastle University, MSc, Advanced Computer Science, Merit	Aug 2023
University of Tennessee, Chengdu University of Information Technology, BE, Distinguished Graduate	Jul 2021

## Peer-reviewed Publications

- Ziqing Guo, Ziwen Pan. (2026). Quantum Polynomial Root Finding and Entanglement-enhanced Spatial Encoding for High-dimensional Data Processing (APS March Meeting). Submitted.
- Ziqing Guo, Jan Balewski, Wenshuo Hu, Alex Khan, Ziwen Pan. (2025). Quantum Approximate Walk Algorithm (Nature npj quantum information, APS March Meeting). Submitted.
- Ziqing Guo, Jan Balewski, Ziwen Pan. (2025). ShardQ: Circuit Cutting and 3D Tensor Recomposition for Quantum Simulation on Superconducting Qubits. Submitted to the ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS). Submitted.
- Ziqing Guo, Jan Balewski, Ziwen Pan. (2025). Vectorized similarity attention with learnable encoding for quantum transformer. Accepted to the Association for the advancement of Artificial Intelligence quantum symposium (AAAI). Oral presentation.
- Ziqing Guo, Alex Khan, Victor S. Sheng, Shabnam Jabeen, Ziwen Pan. (2025). Quantum parallel information exchange (QPIE) hybrid network with transfer learning. In IOP Quantum Science and Technology. HTML
- Ziqing Guo, Steven Rayan, Wenshuo Hu, Ziwen Pan. (2025). [QAOA paper] Direct entanglement ansatz learning (DEAL) with ZNE on error-prone superconducting qubits. Accepted in IEEE International Conference on Quantum Computing and Engineering (QCE) Public Talk. PDF Oral presentation.
- Ziqing Guo, Jan Balewski, Ziwen Pan. (2024). Q-GEAR: Improving quantum simulation framework. In 54th International Conference on Parallel Processing (ICPP). Oral presentation. Accepted. Best Poster Award PDF

## Employment Experience

Research Affiliate Intern, Lawrence Berkeley National Lab, NERSC	Jun 2024 – Present
Research Fellow, Texas Tech University	Sep 2023 – Present
Research Assistant, Newcastle University	Jun 2022 – Jun 2023
Cloud Engineering Intern, CISCO	Dec 2021 – Jun 2022

## Grant & Awards

• AAAI Quantum Symposia Travel Grant \$850	Nov 2025
• Texas Quantum Summit Travel Grant \$1k	Oct 2025
• ICPP Travel Grant \$1k	Sep 2025
• QCE Whiteacre College of Engineering Research Grant \$750	Sep 2025
• IonQ Research Grant, \$350k	Jul 2025
• IBM LBNL QCAN Award, Contract, NERSC, DoE(No. DE-AC02-05CH11231)	Mar 2025
• GenQ Quantum Hackathon, \$2.5k, Cat Qubit, First Prize	Oct 2024
• Qiskit Quantum Summer School / Quantum Challenge, Full Achievement	Jun 2024
• AWS Braket Quantum Application Development, Certificate	Mar 2024
• AWS Braket Research Grant, \$2k, SV1, TN1	Feb 2024
• Pennylane Open Hackathon QHack / Code Camp, Top Completionist	Jan 2024

## Invited Talks

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Special topic on Q-Gear generalization NVIDIA, 2025  
International Conference on Parallel Processing, Quantum Computing, Sep 2025  
International Conference on Quantum Computing, QAI, Aug 2025  
Monterey Data Conference, Aug 2025  
IBM Quantum / AI, TTU, Apr 2025  
Improving quantum computation model, WCOE, Apr 2025  
HackTX, University of Austin, Jan 2025 (Mentor)  
Wave Technology, City of Calgary, Nov 2024  
Platform Calgary, University of Saskatchewan, QAI Venture, Oct 2024  
Berkeley National Lab, National Energy Research Computing, Quantum Group, Jul 2024  
QuEra - NERSC quantum group neutral atom pattern formulation, Jun 2024  
NVIDIA CUDA Quantum, QCAN, Jun 2024

## Professional Services

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npj Quantum Information  
IOP Quantum Science and Technology  
IEEE International Conference on Quantum Computing and Engineering  
IEEE Transaction on Quantum Engineering  
ACM Proceedings of the International Conference on Parallel Processing  
Quantum and Beyond NEWSLETTER  
Nature Machine Intelligence  
ACM Transactions on Quantum Computing  
Advanced Quantum Technology  
Wolfram Research Student Ambassador  
IEEE, ACM, APS member

## Projects

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**Improve quantum circuit simulation tool** [github.com/gzquse/Q-Gear](https://github.com/gzquse/Q-Gear)  
• Support SLURM submission; PODMAN container; CUDA-kernel acceleration; PennyLane; image encoding.

**Direct entanglement ansatz learning for quadratic unconstrained binary optimization (QUBO)** [github.com/gzquse/QUBO](https://github.com/gzquse/QUBO)  
• Distributed learning; efficient ansatz encoding; multiple QUBO problem solvers.

**Automated text mining of biomedical literature** [Huggingface/BioGPT](https://huggingface.co/BioGPT)  
• Transformer-based; auto-regressive mining; 95% accuracy for biomedical domain literature.

## Skills

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**Quantum (Proficiency):** QISKIT (Heron-2 type superconducting), **CUDA-Q** (cuTensorNet, cuStatevector, NVIDIA-GPU), **IONQ** (Trapped Ion Aria-2, Forte), **PENNYLANE** (software stack), **AMAZON BRAKET** (QaaS), **QCI-DIRAC3** (Photonic QPU), **FIRE OPAL (Q-CTRL)**, **TENSORCIRCUIT** (Tencent), **CIRQ** (Azure, Microsoft)

**Engineering:** Python, Mathematica, Fortran, CUDA/MPI, Bash, Julia, Matlab, Cray HPC, Slurm, Container, DevOps, Scraping/Data Mining

**Interests:** Guitar fingerpicker, Table tennis (competitive, shakehand grip), Calisthenics, Rollerblading, Culinary enthusiast

**Languages:** English (proficient), Mandarin (native), Japanese (Elementary)