Ziqing Guo

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Education

Texas Tech University, **PhD in Computer Science, Prof. Ziwen Pan's group, High Performance Computing Center Fellow** — Present

Newcastle University, **MSc, Advanced Computer Science, Merit** — Aug 2023

University of Tennessee, **Chengdu University of Information Technology**, **BE, Distinguished Graduate** — Jul 2021

Publications

- 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).
- Ziqing Guo, Jan Balewski, Ziwen Pan. (2025). Vectorized similarity attention with learnable encoding for quantum transformer. Submitted to the 40th Annual AAAI Conference on Artificial Intelligence (AAAI).
- 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.
- Ziqing Guo, Steven Rayan, Wenshuo Hu, Ziwen Pan. (2025). Direct entanglement ansatz learning (DEAL) with ZNE on error-prone superconducting qubits. Submitted to the IEEE International Conference on Quantum Computing and Engineering (QCE).
- Ziqing Guo, Jan Balewski, Ziwen Pan. (2024). Q-GEAR: Improving quantum simulation framework. In 54th International Conference on Parallel Processing (ICPP).

Grant & Awards

- **IBM LBNL QCAN Award**, 30k$, NERSC, DoE(No. DE-AC02-05CH11231) — Mar 2025
- **GenQ Quantum Hackathon**, 2.5k$, Cat Qubit, First Price, City of Calgory — 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
- **Q-CTRL, Quantum Information Theory,** Certificate — Jun 2023

Invited Talks

Quantum parallel information exchange hybrid network for transfer learning, IJCNN, Jun 2025
IBM Quantum / AI, TTU, Apr 2025
Improving quantum computation model, WCOE, Apr 2025
HackTX, Mentor, University of Austin, Jan 2025
City of Calgory, Wave Technology, Nov 2024
Platform Calgary, University of Saskatchewan, QAI Venture, Oct 2024
Berkeley National Lab, National Energy Research Computing, Quantum Group, Jul 2024
QuEra, Jun 2024
NVIDIA CUDA Quantum, QCAN, Jun 2024

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

Professional Services

IOP Quantum Science and Technology
Springer Nature Quantum Machine Intelligence
IEEE International Conference on Quantum Computing and Engineering
IEEE International Joint Conference on Neural Networks
ACM Proceedings of the International Conference on Parallel Processing
Quantum and Beyond NEWSLETTER
Nature Machine Intelligence
Nature Machine Intelligence
ACM Transactions on Quantum Computing
Advanced Quantum Technology

Projects

Improve quantum circuit simulation tool github.com/gzquse/Q-Gear

- Support SLURM submission; PODMAN container; CUDA-kernel acceleration; PennyLane; image encoding.

Direct entanglement ansatz learning for quadratic unconstraint binary optimization (QUBO) github.com/gzquse/QUBO

- Distributed learning; efficient ansatz encoding; multiple QUBO problem solvers.

Automated text mining of biomedical literature Huggingface/BioGPT

- Transformer-based; auto-regressive mining; 95% accuracy for biomedical domain literature.

Skills

Quantum: Pennylane, CUDA Quantum, Qiskit, Amazon Braket, Fire Opal, Tensorcircuit, cirQ, cuTensorNet

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

Interests: Guitar fingerpicker, table tennis shake hand hold pro player, calisthenics, rollerblading, foodie

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