Ke Chen

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Education

University of Science and Technology of China (USTC), Computer Science — Sept 2024 – Jun 2027 expected

- M.S. in Computer Science and Technology.
- Research focus: fault-tolerant quantum computing, quantum error correction, and quantum compilation.
- Advisor: Wei Xie.

Nanchang University (NCU), Artificial Intelligence Experimental Class — Sept 2020 – Jun 2024

- B.Eng. in Artificial Intelligence.
- Interest: High-performance computing, quantum computing.
- Advisor: Zichen Xu.

Research Interests

- **Fault-tolerant quantum computing:** software-hardware co-design for decoding, compilation, and architecture optimization under realistic hardware constraints, with emphasis on superconducting and neutral-atom platforms.
- **Open-source platforms for early fault-tolerant quantum computing:** end-to-end evaluation of quantum algorithms protected by error-correcting codes, including encoded circuit construction, compilation, noise-aware simulation, decoding, and performance analysis. I actively employ AI-vibe coding to accelerate toolchain development.
- **Classical-quantum heterogeneous co-design:** real-time compilation, decoding, feedback control, and scheduling in future fault-tolerant quantum computing systems.

Publications

- **Ke Chen**, Mingzheng Zhu, Haishan Song, Wei Xie, and Xiang-Yang Li. "Hypergraph-based approximate maximum likelihood decoding for quantum codes under circuit-level noise." *Physical Review Research*, 8(2):023191, May 2026.

Quantum Research Experience

Fault-Tolerant Quantum Computing Research, Linke Lab, School of Computer Science, University of Science and Technology of China — Dec 2023 – Present

- Independently led my first published research project on hypergraph-based approximate maximum-likelihood decoding for quantum codes under circuit-level noise, which strengthened my ability to conduct end-to-end research, from topic formulation and algorithm design to numerical experiments, paper writing, and submission.
- Participated in discussions on fault-tolerant quantum compilation, AI-assisted decoding, AI-assisted calibration.
- Communicated with experimental physics groups at USTC to better understand hardware constraints in realistic quantum systems.

Research Assistant in Quantum Computing and Quantum Information, HKUST Guangzhou — Sept 2023 – Nov 2023

- Supervisor: Prof. Xin Wang.
- Studied quantum information theory and quantum computing, with training in literature review, mathematical formulation, and theoretical analysis.

IBM Qiskit Global Summer School 2023: Theory to Implementation — Jul 2023 – Aug 2023

- Completed all labs and earned Quantum Excellence Badges. Studied quantum algorithms, quantum noise, and Qiskit-based circuit implementation.

USTC Quantum Computing Training Program — Jun 2022 – Sept 2023

- Studied quantum computing and quantum information through weekly presentations and discussions based on Nielsen and Chuang's *Quantum Computation and Quantum Information*.

Huawei Hackathon Quantum Algorithm Competition — Mar 2022 – May 2022

- Explored quantum machine learning methods and implemented related algorithmic experiments.

Study on Qubit Mapping and Quantum Compilation — Jan 2021 – May 2022

- Studied and reproduced papers on qubit mapping, hardware connectivity constraints, and quantum compilation optimization.