ZHONGYI NI

PhD Student in Advanced Materials

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RESEARCH INTERESTS

- Quantum error correction, Open-source computational tools for quantum computing

EDUCATION

The Hong Kong University of Science and Technology (Guangzhou) **Guangzhou, China**
PhD in Advanced Materials Sep 2023 – Present
- Advisor: Prof. Jin-Guo Liu

Fudan University **Shanghai, China**
Bachelor of Science in Electronic Information Science and Technology Sep 2020 – Jun 2022

Fudan University **Shanghai, China**
Bachelor of Science in Mathematics and Applied Mathematics Sep 2016 – Jun 2020

RESEARCH POSITIONS

Institute for Advanced Study, Tsinghua University **Beijing, China**
Visiting Student Jul 2025 – Jul 2026
- Hosted by Prof. Yingfei Gu.

The Hong Kong University of Science and Technology (Guangzhou) **Guangzhou, China**
PhD Student Sep 2023 – Present
- Supervised by Prof. Jin-Guo Liu.

Shanghai Qi Zhi Institute **Shanghai, China**
Research Assistant Jul 2022 – Jun 2023
- Supervised by Prof. Xiaopeng Li.

PUBLICATIONS & PREPRINTS

1. Yuqing Wang, Xiaotian Nie, Jiale Dai, **Zhongyi Ni**, Tao Zhang, Hui Zhai, and Linghui Chen. AI-Enabled Decoding of Qubit Loss for Quantum Error-Correcting Codes. arXiv:2604.14269 [quant-ph], 2026.
2. Tangyou Huang, Jing-Jun Zhu, and **Zhongyi Ni**. Optimal Control by Variational Quantum Algorithms. arXiv:2505.23373 [quant-ph], 2025.
3. **Zhongyi Ni**, Yu-Sheng Zhao, and Jin-Guo Liu. Universal Quantum Computing with a Single Arbitrary Gate. arXiv:2409.20025 [quant-ph], 2024.
4. Tangyou Huang, Zhongcheng Yu, **Zhongyi Ni**, Xiaoji Zhou, and Xiaopeng Li. Quantum Force Sensing by Digital Twinning of Atomic Bose-Einstein Condensates. **Communications Physics** 7(1), 2024. DOI: 10.1038/s42005-024-01662-1.

OPEN SOURCE CONTRIBUTIONS

TensorQEC.jl
Maintainer
- Julia package for tensor-network methods in quantum error correction.

QuantumClifford.jl
Contributor
- Open-source contributions to a Julia toolkit for quantum circuit and stabilizer simulation.

qec-thrust
Maintainer
- Typst package for visualizing quantum error correction codes.

ILPQEC
Maintainer
- Python package for maximum-likelihood quantum error correction decoding using integer linear programming.

rstim
Maintainer
- Rust implementation of Stim-like stabilizer circuit simulation with atom-loss-aware workflows.

TALKS

Tensor Network for Quantum Error Correction
JuliaCon talk Jul 2025
- Conference talk centered on TensorQEC.jl and tensor-network approaches to quantum error correction.

AWARDS

Silver Medal, China Mathematics Olympiad **China**
Issued by *China Mathematics Olympiad* Nov 2015

Excellent Prize, Shenzhen Cup Mathematical Modeling Competition **China**
Issued by *Shenzhen Cup Mathematical Modeling Competition* Nov 2018