TINGRUI LYU

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SUMMARY

Top 1 University in China and **Top 5 quantum computing center** in the world. Strong foundation in **mathematics** and **physics**, with advanced **programming skills** and expertise in **quantum computation**. Strong Intention to combine quantum computing with **fintech**. Experience in machine learning and physical models. Hands-on expertise in optimization, algorithms, SQL, Python, and R.

EDUCATION

University of Southern California, MSc   Los Angeles, CA, Expected June 2026
- Quantum Information Science (in ECE)

Tsinghua University, BSc & BEng   Beijing, China, Sep 2020-July 2024
- Mathematics and Physics
- Material Science and Technology Sep 2020-July 2024

SKILLS

- **Programming**: C++, MATLAB, R, Python, Perl, SAS, SQL, Excel/VBA; Data Structure & Algorithm
- **ML and related**: TensorFlow, NumPy, Pytorch, Transformer, Deep Learning, Data Pre-processing
- **Quantitative Aptitude**: Linear algebra, Statistics, Stochastic Process
- **Cloud:** AWS, Google Firebase
- **Quantum Information**: Qiskit, Q-machine Learning, Q-Algorithms, AWS Braket, Pennylane, D-wave
- **Tools**: MS Office, Latex, Git, GitHub, Visual Studio Code, JetBrains, Xcode

PROJECTS

Quantitative & Quantum Computation   Los Angeles, CA, Present
- Studied the use of quantum computing algorithms such as QAE and QUBO to accelerate options pricing and explored the application of these algorithms in today's NISQ systems and future fault-tolerant quantum systems
- Developing quantum machine learning algorithm to accelerate financial fraudulence detection and deploy it with AWS
- Focusing on combining fintech with quantum computing at USC-Lockheed Martin QC Center

EXPERIENCES

Internship Researcher, Peixun Fan Group   Tsinghua University, Beijing, Feb 2024-July 2024
- Constructed ML algorithm to predict superhydrophobicity of materials for laser industry, realizing classification, prediction, and inverse design with 96% accuracy and ~0.5 error
- Optimized pre-processing design and prediction of superhydrophobic laser industry, reducing experimental cost of 300$ and 3 hours each time, boosting 1000-100000+ times predictive modeling speed
- Article will publish soon. [GitHub Code Here](#)

Internship Researcher, Mingsheng Ying Group   Tsinghua University, Beijing, Feb 2022-Sep 2023
- Accelerated searching process of quantum invariants by several orders of magnitude using ML methods and quantum algorithm. Boosting verification of quantum programs with 10-1000+ times speed increase. Potential to enhance fintech optimization
- Advanced skills in convex optimization and genetic algorithms, especially in combination optimization
- Collaboration with team

LANGUAGES

- Chinese (Mandarin): Native
- English: Full Proficiency   TOEFL: 111