

Siyuan Feng

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EDUCATION

University of Warwick

Sep 2024 – Present

BSc Mathematics

Tianjin Foreign Languages School

Sep 2021 – Jun 2024

TECHNICAL SKILLS

- **Programming & Machine Learning:** Python (NumPy, pandas, matplotlib, scikit-learn, PyTorch, OpenCV), MATLAB, R, Java
- **Tools & Environments:** Linux, Git, Jupyter, Conda/Anaconda, VS Code, Windows PowerShell / CMD, $\LaTeX$
- **Languages:** Chinese (Native), English (IELTS 7.5)

RESEARCH EXPERIENCE

Undergraduate Researcher, Machine Learning Theory (Warwick URSS)

Jun 2026 – Jul 2026

Supervisor: Fanghui Liu Manuscript: *Two-Step Optimal Learning-Rate Geometry under μP*

- Studied the global geometry of optimal learning rates in a two-step deep linear μP network; derived an exact finite-width state compression and deterministic wide-limit polynomial loss.
- Proved generic uniqueness over an open dense, full-measure set of positive-definite multisample data, and constructed a full-rank exceptional family with three positive nondegenerate global optima.
- Established argmin-set stability under data perturbations and persistence of finite-width local-minimum branches; completed a full research manuscript.

INTERNSHIP EXPERIENCE

Tianma Microelectronics Co., Ltd. – Algorithm Engineering Intern

Aug 2025 – Sep 2025

- Built a pixel-level E-paper video ghosting simulation pipeline in MATLAB and Python, covering frame extraction, D/A drive mapping, and A/D grayscale output across 3 core modules; supported 1-bit input and 256-level grayscale output.
- Designed a history-frame-difference-based three-state hold algorithm; replaced pixel-wise loops with NumPy vectorisation, reducing single-run simulation time by approximately 85%.

PROJECT EXPERIENCE

Research Paper: A Symplectic-Form Proof of the Gottesman–Knill Theorem

Jan 2026 – Mar 2026

- Conducted an independent study of the Gottesman–Knill theorem and classical simulation of quantum circuits; developed a symplectic linear-algebraic proof based on binary encodings of Pauli operators.
- Paper link: [doi:10.5281/zenodo.19615972](https://doi.org/10.5281/zenodo.19615972)

Quantum Algorithm Modelling, Simulation and Variational Optimisation

Dec 2025 – Jan 2026

- Built a MindQuantum simulation environment; reproduced QFT, QAOA, and VQE, and implemented MaxCut optimisation and H_2 ground-state energy estimation.

Regression and Classification Model Implementation and Evaluation

Jan 2025 – Mar 2025

- Performed data cleaning, visualisation, baseline construction, and error diagnosis on real-world datasets; implemented linear regression, logistic regression, and a one-hidden-layer neural network in NumPy and compared generalisation across training settings.

TEACHING EXPERIENCE

A-Level Mathematics & Cambridge STEP Tutor

Apr 2024 – Aug 2024

- Delivered 100+ hours of tutoring; supported students in gaining offers from Oxford, Imperial College London, NUS, and other universities.