<Maida> <Wang>

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Education

Centre for Computational Science, UCL *UK*

Ph.D. in Quantum Computing and Machine Learning Sep. 2024 - now

Supervisor: Peter V. Coveney; Second Supervisor: Dan Browne

Wuhan University (Best Chinese Universities Rank: 9) *China*

MS in Applied Mathematics Sep. 2021 - Jun. 2024

GPA: 3.6/4.0. Score: 90.4/100.

Wuhan University (Best Chinese Universities Rank: 9) *China*

BS in Mathematics and Applied Mathematics Sep. 2017 - Jun. 2021

GPA: 3.6/4.0. Score: 85.7/100. Rank: 3/48.

Research Projects

Structural Uncertainty Geometry and Quantum Advantage in Quantum Learning

UK Engineering and Physical Sciences Research Council (EPSRC) Grant No. EP/W007711/1 and VVUQ-evaluated Exascale Applications (SEAVEA) Sep. 2024 – Present

- Topic: Quantum Advantage and Uncertainty Complexity in Variational Quantum Circuits
- Detail: This project investigates the structural properties of uncertainty propagation in parameterised quantum circuits (PQCs). I study the geometry of gradient covariance and Fisher information operators induced by Lie-algebraic parameterisations, aiming to characterise effective dimension, active subspaces, and controllability constraints. The goal is to formalise complexity-theoretic distinctions between quantum and classical overparameterised models in terms of uncertainty structure rather than raw expressivity.
- Supervisor: Peter V. Coveney

Research on Quantum advantages in Quantum Machine Learning

UK Engineering and Physical Sciences Research Council (EPSRC) Grant No. EP/W007711/1 Sep. 2024 - Present

- Topic: Quantum Advantages in Machine Learning
- Detail: This project mainly explores the potential quantum advantages in quantum machine learning, which will be explored from both theoretical and experimental perspectives. Specifically, we replicated the experiment in the article "Quantum advantage in learning from experiences" published by the Google team. In this project, I am mainly responsible for the theoretical analysis and implementation of QML.
- Supervisor: Peter V. Coveney

Quantum-Informed Machine Learning (QIML) for High-Performance Scientific AI

UCL in collaboration with NVIDIA Mar. 2022 – Present

- Topic: Quantum-Informed Machine Learning for Large-Scale Chaotic PDE Systems
- Detail: This project develops Quantum-Informed Machine Learning (QIML) architectures for integration into high-performance AI workflows targeting large-scale scientific applications, including European continental weather forecasting. In collaboration with NVIDIA, we embed quantum-derived statistical priors and classical-based dynamical structures into GPU-accelerated deep learning frameworks, aiming to enhance long-horizon stability, invariant measure consistency, and computational efficiency in exascale environments.
- Supervisor: Peter V. Coveney; Collaborator: Zohim Chandani

Publications

[1] **Maida Wang**, Xiao Xue, Mingyang Gao, Peter V. Coveney*. "Quantum-Informed Machine Learning for Predicting Spatiotemporal Chaos with Practical Quantum Advantage," *Science Advances*. [Link]

[2] **Maida Wang**, Jinyang Jiang, Peter V. Coveney*. "Parameter-Efficient Quantum Anomaly Detection Method on a Superconducting Quantum Processor," *Physical Review Research*. [Link]

[3] **Maida Wang**, Anqi Huang*, Yong Liu, et al. "A Quantum-Classical Hybrid Solution for Deep Anomaly Detection ," *Entropy*. [Link]

[4] **Maida Wang**, Zhongxiang Zhang*. "Using The Ternary Closed-loop Model to Research on Pterosaurs' flight capability," *ICMAI* . [Link]

[5] Xue, X., Yang, T., Gao, M., Pan, L., **Wang, M.**, Zhu, K., ... & Coveney, P. V. "Uni-Flow: a unified autoregressive-diffusion model for complex multiscale flows," *arXiv preprint*. [Link]

Working Experience

Department of Information Science, UCL *London*

Teaching Assistant Jan. 2025 - May. 2025

Responsible for teaching MySQL to students.

Department of Computer Science, UCL *London*

Teaching Assistant Sep. 2025 - Mar. 2026

Responsible for teaching machine learning to students.

Department of Engineering, UCL *London*

Teaching Assistant Sep. 2025 - Mar. 2026

Responsible for teaching mathematical modelling to students.

Baidu *China*

Algorithm Engineer 08. 2022 - 11. 2022

Baidu Quantum platform algorithm designer. Primary responsibility is to help set up demonstration algorithms for the cloud platform.

2086 Laboratory of China Electronics Corporation *China*

Advanced Computing Engineer 11. 2022 - 06. 2024

Responsible for researching quantum machine learning algorithms.

Technical Skills

Theoretical Foundations	Statistical Learning Theory; Covering Number Analysis; Generalisation Error Bounds; Effective Dimension; Active Subspace
Professional Softwares	Pycharm, SPSS, SQL
Programming	Python (NumPy, PyTorch, PennyLane, Qiskit); High-Performance GPU Workflows