Siqi Yao B.Sc.

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Research Statement

My research interests lie in **quantum computation** and **quantum information theory**, with a particular focus on their practical applications. I am also interested in the **intersection between quantum science and artificial intelligence**.

Education

School of Data Science, The Chinese University of Hong Kong, Shenzhen Shenzhen, China

B.Sc. in Data Science and Big Data Technology 2022.9 - 2026.7

- CGPA: 3.89/4.00, Major Rank: 7/150.
- Dean's List, 2023.6.
- Dean's List, 2024.6.
- Academic Performance Scholarship: Class B, AY2023–2024.

Berkeley Global Access program, University of California Berkeley Berkeley, U.S.

Exchange student 2024.8 - 2024.12

- GPA: 4.00.

Experiences

Prof. Kun Fang's Group | School of Data Science, The Chinese University of Hong Kong, Shenzhen 2025.6 - Current

- First author on the paper *Resource Theory of Asymmetric Distinguishability with Partial Information* completed with Prof. Fang.
- Formulated and analyzed distinguishability distillation and dilution tasks, established optimal rates' connection with quantum divergences, and proved a reversibility theorem based on regularized quantities.
- Carried out most mathematical derivations and paper drafting; strengthened skills in mathematical reasoning, collaborative research, and communicating complex theoretical ideas under pressure.

Prof. Kai Zhou's Group | School of Science and Engineering, The Chinese University of Hong Kong, Shenzhen 2024.08 - 2025.08

- Explored theoretical foundations and practical applications of score matching and flow matching.
- Investigated rectified flow and stochastic interpolation methods.
- Conducted research on the paper Energy based diffusion generator for efficient sampling of Boltzmann distributions, successfully reproduced the results, and proposed to replace its core procedure with stochastic interpolation.

Dr. Jingyi Zhao's Group | Shenzhen Research Institute of Big Data 2024.12 - 2025.6

- Conducted research on Learning to Optimize (L2O) and Mixed Integer Non-Linear Programming (MINLP). Contributed to the paper Learning to Optimize for Mixed-Integer Non-linear Programming with Feasibility Guarantees.
- Built a *predict-then-optimize* framework to solve a real-world wind power optimization problem in Shanxi Province, incorporating techniques such as Mixture of Experts (MoE) for forecasting and MINLP for constrained optimization.

Prof. Junfeng Wu's Group | School of Data Science, The Chinese University of Hong Kong, Shenzhen 2024.01 - 2024.08

- Studied Simultaneous Localization and Mapping (SLAM), Neural Radiance Fields (NeRF), and privacy-preserving techniques in machine learning, including Federated Learning and Split Learning.
- Contributed to the Split-NeRF project, which applies Split Learning to NeRF to enhance data privacy during 3D scene reconstruction.

Projects

Comparing Traditional Methods and Diffusion Models for Hybrid Image and Visual Anagram Generation Tasks | 2025 Summer

- Implemented hybrid image and visual anagram generation using diffusion model and traditional methods such as image pyramids.
- Systematically compared the performance using multiple metrics such as visual quality and CLIP similarity score.
- Link: https://github.com/YaoSiqi2003/ECE4513-Image-Processing-and-Computer-Vision.

Building Interpretable Emotional Dialogue Agents via Chain-of-Thought Reasoning | 2025 Spring

- Developed a unified framework for machine emotional intelligence that integrates emotion recognition, cause inference, shift detection, and dialogue generation using Chain-of-Thought (CoT) reasoning.
- Link: https://github.com/YaoSiqi2003/DDA4210-Advanced-Machine-Learning.

ICU Simulation and Resource Optimization | 2024 Fall

- Utilize simulation frameworks to optimize resources in the Intensive Care Unit (ICU), including critical components such as beds and nursing staff.
- Key components include ICU queue simulation, nursing staff Workflow simulation and various optimization methods such as exhaustive search, heuristics, and Pareto frontier-based method.
- Link: https://github.com/YaoSiqi2003/IND-ENG-174.

AI Programming and Applications | 2024 Fall

- Implement various applications of AI, including search algorithms, multi-agent systems, reinforcement learning, probabilistic reasoning and deep learning.
- Link: https://github.com/YaoSiqi2003/CS188-Introduction-to-Artificial-Intelligence.

Internships

Shenzhen Guanghuiyuan Asset Management Co., Ltd. | Shenzhen, China 2023.07 - 2023.08

- Studied and participated in value investment research.

Teaching

Teaching Assistant | CSC4012 Introduction to Quantum Computation and Quantum Information, The Chinese University of Hong Kong, Shenzhen 2025 Fall

- Assisting in course delivery, including grading, tutorial sessions, and student consultations.

Skills

Languages: Mandarin, Cantonese, English.

Skills: `Python`, `Qiskit`, `TensorFlow`, `PyTorch`.

Others: Solid math foundation. Eager to learn new things.

Last updated: 2025.8.28