

## RESEARCH STATEMENT

My research interest lies in AI and machine learning, including their theories and real-world applications, such as computer vision, large language models and AI4Science. I am also interested in AI's applications in optimization and operation research.

## 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.

## WORKING PAPER

- **Siqi Yao, Kun Fang.** *Resource Theory of Asymmetric Distinguishability with Partial Information.*

## EXPERIENCES

**Prof. Kun Fang's Group** | School of Data Science, The Chinese University of Hong Kong, Shenzhen 2025.7 - 2025.9

- **First author on the paper *Resource Theory of Asymmetric Distinguishability with Partial Information*.**
- Formulated and analyzed distinguishability distillation and dilution tasks in the partial information setting, 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 deep generative models such as score model and flow model, and their relationships with statistical physics.
- 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 paper *S<sup>2</sup> NeRF: Privacy-preserving Training Framework for NeRF*, which applies techniques including Split Learning to NeRF to enhance data privacy during 3D scene reconstruction.

PROJECTS	<b>Comparing Traditional Methods and Diffusion Models for Hybrid Image and Visual Anagram Generation Tasks</b>   2025 Summer <ul style="list-style-type: none"> <li>Implemented hybrid image and visual anagram generation using diffusion model and traditional methods such as image pyramids.</li> <li>Systematically compared the performance using multiple metrics such as visual quality and CLIP similarity score.</li> <li>Link: <a href="https://github.com/YaoSiqi2003/ECE4513-Image-Processing-and-Computer-Vision">https://github.com/YaoSiqi2003/ECE4513-Image-Processing-and-Computer-Vision</a>.</li> </ul>
	<b>Building Interpretable Emotional Dialogue Agents via Chain-of-Thought Reasoning</b>   2025 Spring <ul style="list-style-type: none"> <li>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.</li> <li>Link: <a href="https://github.com/YaoSiqi2003/DDA4210-Advanced-Machine-Learning">https://github.com/YaoSiqi2003/DDA4210-Advanced-Machine-Learning</a>.</li> </ul>
	<b>ICU Simulation and Resource Optimization</b>   2024 Fall <ul style="list-style-type: none"> <li>Utilize simulation frameworks to optimize resources in the Intensive Care Unit (ICU), including critical components such as beds and nursing staff.</li> <li>Key components include ICU queue simulation, nursing staff Workflow simulation and various optimization methods such as exhaustive search, heuristics, and Pareto frontier-based method.</li> <li>Link: <a href="https://github.com/YaoSiqi2003/IND-ENG-174">https://github.com/YaoSiqi2003/IND-ENG-174</a>.</li> </ul>
	<b>AI Programming and Applications</b>   2024 Fall <ul style="list-style-type: none"> <li>Implement various applications of AI, including search algorithms, multi-agent systems, reinforcement learning, probabilistic reasoning and deep learning.</li> <li>Link: <a href="https://github.com/YaoSiqi2003/CS188-Introduction-to-Artificial-Intelligence">https://github.com/YaoSiqi2003/CS188-Introduction-to-Artificial-Intelligence</a>.</li> </ul>
	<b>Shenzhen Guanghuiyuan Asset Management Co., Ltd.</b>   Shenzhen, China 2023.07 - 2023.08 <ul style="list-style-type: none"> <li>Studied and participated in value investment research.</li> </ul>
INTERNSHIPS	
TEACHING	<b>Teaching Assistant</b>   CSC4012 Introduction to Quantum Computation and Quantum Information, The Chinese University of Hong Kong, Shenzhen 2025 Fall <ul style="list-style-type: none"> <li>Assisting in course delivery, including grading, tutorial sessions, and student consultations.</li> </ul>
SKILLS	<b>Languages:</b> Mandarin, Cantonese, English.
	<b>Skills:</b> Python, TensorFlow, PyTorch, C, C++, Linux, SQL, Qiskit.
	<b>Others:</b> Solid math foundation. Eager to learn new things.

Last updated: 2025.10.3