MAO Yiteng (Richard)

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Github: https://github.com/RicharMd

Personal Pages: https://richarmd.github.io/

EDUCATION

The Chinese University of Hong Kong (Shenzhen) **| 2023 Fall – 2025 Fall**

Bachelor of Engineering, Major in CS

MGPA:3.964/4.0 | CGPA: 3.846/4.0 (Top 10% in cohort)

Relevant modules: Introduction to Computer Science and Java Programming(A), Linear Algebra and Applications(A-) Computational Laboratory Using Java(A), Discrete Mathematics(A-), C/C++ Programming(A), Data Structures(A), Probability and Statistics I(A), Computer Architecture(A), Database System(A),Operating System(A), Digital Logic and Systems(A), Matrix Computation(A), Numerical Method(A), Machine Learning(A)

Incoming Transfer Student to University of Wisconsin-Madison (Spring 2026)

University of Wisconsin-Madison **| 2026 Spring – Present**

Bachelor of Science, Major in CS

PROJECTS EXPERIENCE

Real-world Student Reasoning Benchmark & Evaluation Pipeline **| Oct. 2025 – Present**

Independent Researcher | Advisor: Prof. Hongyuan Zha

• Benchmark Construction: Built "Pointing Benchmark" (224 samples) from 300+ authentic high-school math assessments, featuring multi-step cognitive errors and fine-grained expert ground-truth.

• Evaluation Gap Discovery: Identified a gap between SOTA LLM judges evaluating "LLM-generated errors" vs. "Human-student errors"; Hypothesized that that human errors are divergent/OOD while LLM errors are convergent, challenging current Reward Models' robustness.

• Methodological Pivot: Transitioned from pure Formal Verification (Lean4) to empirical evaluation, designing a "Meta-Eval" attribution task to classify reasoning failures into "Logic Rigor" vs "Process Norms".

Lean4Eval: Formal Reasoning Models for Large Language Model Evaluation **| Jun. 2025 – Oct. 2025**

Research Assistant | Advisor: Prof. Hongyuan Zha

- Research Contribution: Explored the role of formal reasoning models (Lean4) in evaluating large language models, designing unified pipelines, adapting multiple datasets (e.g., PRM, CodeJudgeBench), and proposing collaborative frameworks to compare model reasoning capabilities;
- Methodological Rigor: Conducted in-depth analysis of bias, error patterns, and overfitting in evaluation tasks; applied reinforcement learning, GRPO, and multi-agent systems to establish a "hypothesis–experiment–analysis" research cycle;
- Scholarly Development: Strengthened independent research capacity through literature synthesis, empirical study, and benchmark design; demonstrated adaptability by refining research directions and emphasizing reproducibility, critical thinking, and interdisciplinary integration.

Algorithmic Trading Agent: RL & Transformer Integration **| Oct. 2025 – Dec. 2025**

Individual Project | Kaggle Competition

• SFT-GRPO Pipeline: Designed a two-stage pipeline: SFT (N-HiTS) for signal generation + GRPO (Generalized Reinforcement Policy Optimization) for decision making.

• "Rotten Apple" Mechanism: Implemented a rolling OOS signal generation mechanism to prevent look-ahead bias during RL training, simulating realistic noisy environments.

High-Performance Numerical Image Deblurring **| Nov. 2025 – Dec. 2025**

Individual Project | Advisor: Prof. Andre Milzarek

• Algorithm Optimization: Implemented JIT-compiled (Numba) Givens Rotation QR factorization, exploiting banded structure to outperform LAPACK (Scipy) by 6x.

Cafeteria Management System: Integrated Database and AI Architecture **| Feb. 2025 – May 2025**

Group Leader | Advisor: Prof. Clement Leung

- Technical Leadership: Directed an 8-member team in building a cafeteria management system integrating OLTP/OLAP workflows with LLM; optimized relational schemas to 4NF, reducing storage redundancy by 30%; engineered a high-concurrency transaction framework supporting multi-order-per-second throughput.
- System Integration: Designed end-to-end data pipeline from MySQL with advanced locking to star-schema data warehouse; implemented seven OLAP analysis models using window functions and hierarchical aggregation; bridged SQL backend with GPT-4 LLM interface ensuring schema-aware translation and security.

Managed database, LLM, and frontend via strategic delegation; delivered scalable AI-system for real-world campus dining.

Design and Implementation of a Decentralized Identity System for Data Spaces **| Sept. 2024 – Feb 2025**

Team Member | Advisor: Prof. Huang Jianhua

- Technical Research & Standardization: Analyzed W3C standards to systematically define core concepts of DID/VC/VP (e.g., blockchain storage, hash-based verification); created logic diagrams and published them on the team website; delivered standardized technical documentation with sample code;
- Data Space Deployment & Evaluation: Successfully deployed two open-source projects: FIWARE MVDS and EDC MVDS**;** conducted comparative analysis on scalability and interoperability; selected EDC MVDS for further functional extension;
- Technical Implementation: Built a minimal data space testbed to validate interaction flows among Holder, Issuer, and Verifier roles**;** documented the DID/VC/VP workflow to establish a “theory–prototype–evaluation” development loop.

2D Side-Scrolling Pixel-Style Games Development Based on C++ and SFML **| Sept. 2024 – Feb 2025**

Team Leader | Advisor: Prof. Huang Rui

- Project Leadership & Technical Architecture: Led technology decision-making as project lead, opted for SFML over Unreal Engine based on project requirements and performance benchmarks; designed the game architecture, including the main game loop and standardized interface conventions (.h/.cpp separation);
- Core Feature Development: Developed the player control system (movement, jump, attack) with over 2000 lines of C++; Built the NPC interaction system using object-oriented inheritance, supporting dialogue and trading functions Implemented GUI interfaces with SFML rendering;
- Code Integration & Optimization: Led multi-module integration (map, NPC, combat systems), resolving compatibility issues; diagnosed and fixed critical bugs, including memory leaks and animation state conflicts; Produced standardized documentation covering interface specifications and debug records.

Research on Digital Twin Technology and Standardization **| Jun. 2024 – Sep. 2024**

Team Member | Advisor: Prof. Huang Jianhua

- Technical Research & Analysis: Conducted a literature review on digital twin technologies, including two key academic papers; proposed a framework based on the Asset Administration Shell (AAS) concept; identified practical use cases and technical bottlenecks in Industry 4.0 applications;
- AAS System Implementation: Developed digital twin models (Student/Professor/Classroom) using the Eclipse BaSyx open-source platform (Java); implemented client-side interaction features for real-time data querying and modification;
- Project Delivery: Produced comprehensive technical documentation, including an API guide; released the project as open-source on GitHub; delivered an adaptation plan for applying industrial AAS frameworks to educational scenarios**.**

TECHNICAL SKILLS

• Languages: Python (Expert), C++ (System), Java (Enterprise), Lean4 (Formal Verification), SQL, MATLAB.

• AI & Research: PyTorch, Transformers (Hugging Face), RLHF (PPO/GRPO/DPO), Numba (HPC), OOD Detection.

• Tools: Git, Docker, Linux, LaTeX, SFML, JavaFX.

• Languages: Chinese (Native), English (Fluent, TOEFL 109).

EXTRA-CURRICULAR & INTERESTS

- **Undergraduate Student Teaching Fellow：** Serve as the USTF (Undergraduate Student Teaching Fellow) for CSC3050 Computer Architecture in the Fall 2025 semester.
- **Basketball Team Captain (2022–2023):** Led a 10-member team to the regional championship finals; enhanced team performance through strategic gameplay design, collaborative training, and leadership under pressure.
- **Competitive Sports Enthusiast:** Experienced in swimming, mountain biking, alpine skiing, badminton, and tennis, fostering resilience, teamwork, and adaptability across diverse athletic contexts.