

Runxuan Yin

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🌐 github.com/yinrx3

🌐 yinrx3.github.io

EDUCATION

Sun Yat-sen University, School of Mathematics (Zhuhai) 09/2023 - 06/2027

B.Sc. in Applied and Computational Mathematics Zhuhai, China

- GPA: 4.1/5.0 | Rank: 6/87
- National Scholarship, 2024. (Top 0.4% of undergraduate students nationwide)
- First-Class Undergraduate Scholarship, 2024 & 2025. (Top 5% of the school)

Hong Kong University of Science and Technology (Guangzhou) 04/2026 - 08/2026

Visiting Student in Information-hub Guangzhou, China

- Supervised by Assistant Professor [Zixin Zhong](#)
- Research area: Multi-armed Bandit Problems, Reinforcement learning

Sun Yat-sen University, School of Management 09/2022 - 06/2023

Economics (Retained as a minor program) Guangzhou, China

- GPA: 4.28/5.0 | Rank: 3/161 (Before transferring)

RESEARCH INTERESTS

Foundations

- Theoretical machine learning
- Graph neural networks and graph representation learning
- Causal inference and probabilistic modeling

Future Directions

- Causal preference modeling for LLM personalization
- Graph-centric multi-domain and multi-modal learning

RESEARCH EXPERIENCE

Linear Bandits with Ranking Feedback 04/2026 – Present

Visiting Student, HKUST(GZ) | Supervised by Assistant Professor [Zixin Zhong](#)

- **Problem.** Modeled industrial scenarios (e.g., online advertising, product testing) where only ordinal ranking feedback is available due to privacy constraints, as a linear bandit problem.
- **Impossibility of logarithmic regret.** Proved that logarithmic regret is information-theoretically impossible under ranking feedback, by constructing two minimally differing instances and controlling the KL divergence of the ranking observations.
- **Algorithm design and regret analysis.** (1) DREE: structure-blind baseline with super-logarithmic exploration, achieving $\tilde{O}((\log T)^{1+\delta} \sum \Delta_i)$ regret. (2) ABEE: geometry-aware elimination for $K \gg d$; proved reference-set reliability, safe elimination, and maximal element screening lemmas; achieves $\tilde{O}(d(\log T)^{1+\delta}/\Delta)$ regret.

SELECTED COURSE PROJECTS

Akari Puzzle Solver: Backtracking with Constraint Propagation 2025

Course Project, Algorithm Design and Analysis

- Built a backtracking-based solver for the Akari puzzle with constraint propagation and heuristic selection, unifying three reasoning strategies into a single pipeline.
- Implemented loose vs. strict constraint checking schemes for efficient early pruning during search, alongside a unique light-source inference mechanism to reduce branching factor.
- Verified performance on all tested instances (≤ 500 cells, ≤ 8 seconds); submitted complete source code and a technical write-up analyzing function-level design decisions.

- 3-SAT Problem Solver: Independent Algorithm Design**
2024

Course Project, Data Structures

 - Conceived a complete SAT algorithm from first principles, independently rediscovering the core DPLL framework (backtracking search + unit propagation), without prior literature consultation.
 - Enhanced with heuristic variable selection and conflict analysis; robustly solved random 3-SAT instances up to 400 variables / 500 clauses, all within 2 seconds.

- K-Shortest Path Solver for Dense Graphs**
2024

Course Project, Data Structures

 - Implemented Yen's KSP algorithm with support for node blacklisting, relay limits, and path length constraints.
 - Designed a dual adjacency matrix to guarantee correct edge removal/restoration under heavy spur-path recomputation on dense and complete graphs.

HONORS & AWARDS

- National Scholarship, Ministry of Education of China (Top 0.4%)
2024

First-Class Undergraduate Scholarship, Sun Yat-sen University (Top 5%)
2024, 2025

Special Scholarship, Sun Yat-sen University (Top 3%)
2024

Provincial First Prize, National College Student Mathematics Competition (Top 5%)
2024

Provincial First Prize, National College Student Mathematical Modeling Contest (Top 5%)
2024

TECHNICAL SKILLS & LANGUAGES

Programming & Tools: C/C++, Matlab, LaTeX, Python.

English Proficiency: IELTS 7.0 (Listening 7.5, Reading 7.5, Writing 6.5, Speaking 6.5)

TEACHING & ACADEMIC SERVICE

- Course instructor member of Student-Led Seminars**
02/2025 - 03/2026

 - Organized and led a weekly seminar for graduate and advanced undergraduate students. Content was structured at PhD qualifying exam depth.
 - Advanced Probability, Martingale Theory, Advanced Stochastic Processes,
 - Distribution Theory, Functional Analysis, PDEs, Qualitative Theory of ODEs.
- Teaching Assistant, Probability Theory Course**
05/2026 - 06/2026

 - Lectured on asymptotic theorems (SLLN, CLT, LIL) and guided problem-solving sessions.
- Teaching Assistant, Real Analysis Course**
03/2025 - 05/2025

 - Prepared weekly handouts and led recitations on measure-theoretic analysis techniques.
- Teaching Assistant, C++ Programming Course**
11/2023 - 01/2024

 - Led debugging sessions and explained algorithmic problem-solving via LeetCode exercises.

CAMPUS EXPERIENCE

- Violinist, Sun Yat-sen University Symphony Orchestra**
09/2022 - Present

 - Performed in 8 full symphony concerts
 - Arranged scores and organized string quartet performances