

Chendong Song

Research Assistant, IEDA, HKUST

Tel: (+86) 18758412322 ◊ E-mail: songcd1212@gmail.com ◊ Homepage | Google Scholar

EDUCATION

- Tsinghua University** Sep. 2021 - Jun. 2025
Zhili College, B.S. in Mathematics and Applied Mathematics, First-Class Honours Degree of Zhili College
- The Hong Kong University of Science and Technology** Dec. 2025 - now
Research Assistant in Industrial Engineering and Decision Analytics, Mentor: Zijie Zhou

RESEARCH INTERESTS

AI infra, LLM inference, AI for Mathematics

PUBLICATIONS

- Chendong Song**, Meixuan Wang, Hang Zhou, Hong Liang, Yuan Lyu, Zixi Chen, Yuwei Fan, Zijie Zhou : Theoretically Optimal Attention/FFN Ratios in Disaggregated LLM Serving. (paper)
- Zixi Chen, Tianci Bu, **Chendong Song**, Xin Lu, Yinyu Ye, Zijie Zhou : A Universal Load Balancing Principle and Its Application to Large Language Model Serving. (paper)
- Chendong Song**, Zihan Wang, Frederick Pu, Haiming Wang, Xiaohan Lin, Junqi Liu, Jia Li, Zhengying Liu : LeanGeo: Formalizing Competitional Geometry problems in Lean. (paper)
- Haiming Wang, Mert Unsal, Xiaohan Lin, Mantas Baksys, Junqi Liu, Marco Dos Santos, . . . , **Chendong Song**, . . . , Zhengying Liu, Jia Li : Kimina-Prover Preview: Towards Large Formal Reasoning Models with Reinforcement Learning. (tech report)

HONORS AND SCHOLARSHIPS

- First-Class Honours Degree of Zhili College, Tsinghua University** Jun. 2025
- Awarded to top-performing graduates; only recipient in a class of 30 students.
- National High School Mathematics Olympiad** Oct. 2020
- First Prize, Zhejiang Province.
- National Olympiad in Informatics in Provinces(NOIP)** Dec. 2017
- First Prize, Zhejiang Province.
- Tsinghua Xuetao Talent Program Scholarship, Tsinghua University** Jun. 2022 - Jun. 2025
- Awarded to top-performing graduates based on academic excellence.
- Comprehensive Excellence Scholarship, Tsinghua University** Dec. 2024
- Awarded to top 20% students for overall excellence.
- Academic Excellence Scholarship, Tsinghua University** Jan. 2023 & Jan. 2024
- Top 10% of students in two consecutive years.

RESEARCH EXPERIENCE

- Theoretical Optimization of LLM Inference Systems** Dec. 2025 - now
Research Assistant, HKUST, Advisor: Zijie Zhou

- Developed an analytical framework for sizing Attention-FFN disaggregated (AFD) decoding bundles. Modeled nonstationary Attention workloads probabilistically and derived closed-form optimal A/F provisioning ratios that maximize average throughput, validated by numerical simulation to within 10% error. (paper)
- Formulated a universal load-balancing principle for barrier-synchronized in LLM decoding systems via step-wise finite-horizon integer optimization, achieving worst-case imbalance reduction that scales with batch size B and number of workers G in an $\sqrt{B \log G}$ order. (paper)

Formalization of Geometric Problems and RL Training on Formal Mathematics Feb. 2025 - Jul. 2025

Internship, Moonshot AI, Advisor : Zhengying Liu, Jia Li

- Developed the first formal system for competition-level geometric reasoning, comprising a corpus of 260 theorems. Developed the first geometric reasoning benchmark and evaluate the performance of different LLMs. (paper)
- Used prompt engineering to generate prompt set and SFT data for training a reinforcement learning agent. Conduct reinforcement learning on geometry problems.
- Contributed to Kimina-Prover(tech report), SOTA of open-sourced theorem prover, by analyzing the result of RL experiment and preparing prompt sets and SFT data in multiple formats.

Automated Theorem Synthesis in Plane Geometry Sep. 2024 - Jun. 2025

Undergraduate Thesis, Advisor: Prof. Chenglong Bao, Tsinghua University

- Developed an automatic geometric construction system that generates precise diagrams using the formal language of AlphaGeometry.
- Explored strategies for autoformalizing natural language geometry problems, designed a three-step verification pipeline to ensure correctness, developed a dataset comprising 2,720 fully correct geometry problems.
- Deployed AlphaGeometry and conducted comprehensive testing on autoformalized dataset.(paper)

Monotone Inequalities on Ising and Potts Models Dec. 2023 - Aug. 2024

Research Assistant, Advisors: Prof. Chenlin Gu (Yau Mathematical Sciences Center), Prof. Wei Wu (NYU Shanghai)

- Studied various monotone inequalities in Ising models with external fields, such as FKG, GKS, and a recently discovered inequality: $\langle \sigma_o \rangle_{g+h} - \langle \sigma_o \rangle_{g-h} \leq \langle \sigma_o \rangle_h - \langle \sigma_o \rangle_{-h}$. Completed a survey on Ising and Potts models (link).
- Constructed counterexamples of monotone inequalities on binary trees, studied the uniqueness of AF-Potts model on binary tree, and explored optimal boundaries for AF-Potts models under $d + 1 \geq \frac{e-1/2}{e-1}q$ and $1 > w \geq 1 - \frac{q}{d+1} \left(1 - \frac{K}{d+1}\right)$.

LANGUAGES & SKILLS

- TOEFL: 99 (Reading: 28, Listening: 26, Writing: 25, Speaking: 21).
- French: TCF A2. Spanish: Beginner (ongoing).
- Programming: Python, C++, Lean, CUDA (learning).

EXTRACURRICULAR ACTIVITIES

Vice President, Science Association of Zhili College Sep. 2023 - Sep. 2024

- Organized 20 “Qingli Micro-Salon” events for face-to-face communication between mentors and students.

Committee Member, Tsinghua Association Français-Chinois (AFC) 2024.6 - 2025.6

- Organized Sino-French cultural exchange events—including exhibitions, French cultural festivals, film sessions, and student salons, producing photography that documented cross-cultural connections on campus.