Shengye Tao

Undergraduate in Mathematics and Artificial Intelligence

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Profile

Undergraduate student in the inaugural Mathematics and Artificial Intelligence program at the Beijing Institute of Mathematical Sciences and Applications (BIMSA), with an interdisciplinary background spanning electrical engineering, mathematics, machine learning, data analysis, and product development. Experienced in turning open-ended ideas into research prototypes, analytical projects, technical reports, and deployable software products. Current interests include AI for Science, generative modeling, stochastic systems, quantitative research, complex networks, and intelligent tools for human decision-making.

Education

Beijing Institute of Mathematical Sciences and Applications (BIMSA) B.S. Program in Mathematics and Artificial Intelligence — 2025 – Present

Member of the inaugural undergraduate cohort; coursework and academic activities primarily based at Renmin University of China

Beijing University of Civil Engineering and Architecture B.Eng. in Electrical Engineering and Automation — 2023 – 2028 (Expected)

Developed an increasing focus on mathematics, artificial intelligence, data science, and research-oriented project work

Selected Coursework: Mathematical Analysis, Linear Algebra, Probability and Mathematical Statistics, Stochastic Differential Equations, Functional Analysis, Discrete Mathematics, Data Structures, Machine Learning, Data Mining, and Mathematical Modeling.

Selected Projects

Visualized Deadline Founder, Product Designer, and Developer — 2026 – Present

- Designed and built a progressive web application for students and other high-workload users, integrating deadlines, task priority, workload pressure curves, heat zones, and long-term goals into a unified interface.
- Implemented user authentication and data storage with Supabase, and iteratively developed achievement tracking, weekly reports, task ranking, analytics, and mobile usability improvements.
- Managed the full product cycle, including user needs analysis, product definition, interface design, deployment, domain configuration, privacy documentation, and early-stage user operations.
- Acquired more than 30 early registered users, demonstrating the ability to translate a personal productivity problem into a generalizable software product.

MarketManifold Independent Quantitative Research Project — 2026

- Built a market-structure visualization framework using rolling correlations, distance matrices, multidimensional scaling, principal component analysis, and clustering.
- Investigated how common factors, asset concentration, and market geometry change across different market regimes.
- Developed a reproducible workflow for data preprocessing, modeling, visualization, and interpretation, providing a foundation for future work on low-frequency quantitative trading and risk monitoring.

Stochastic Information Diffusion on Networks Mathematical Modeling Project — 2026

- Extended a baseline information diffusion model by introducing stochasticity, network topology, and node heterogeneity to better represent real social propagation processes.
- Designed the modeling framework, interpreted variables, proposed simulation experiments, analyzed expected behavior, and prepared a complete technical report in LaTeX.
- Demonstrated the ability to move beyond standard coursework requirements and formulate a more research-oriented extension.

Machine Learning Paper Reproduction and Research Proposal Team Research Training Project — 2026

- Conducted structured reading and decomposition of an assigned *iScience* paper, including research-question extraction, methodological analysis, and experiment planning.
- Contributed to a research workflow covering paper review, question generation, proposal writing, reproduction planning, and repository-based collaboration.
- Worked with a student team to convert an existing paper into a concrete and executable research plan.

Academic Activities and Highlights

- Participated in the 2026 Tsinghua University AI for Science summer program, with exposure to Wasserstein distance, generative models, diffusion models, stochastic differential equations, numerical methods, and Gaussian approximation.
- Participated in the 2026 Yau College Student Mathematics Contest as part of long-term training in mathematical foundations, proof writing, and advanced problem solving.
- Earned an A in Data Mining through a project emphasizing methodological extension, visualization, technical interpretation, and presentation quality.
- Regularly document projects, technical ideas, and research notes through GitHub, a personal website, and public writing platforms.

Technical Skills

Programming and Tools	Python, C++, Git/GitHub, LaTeX, Supabase, basic web and PWA development, data processing, and visualization
Data and Modeling	Probability and statistics, rolling correlation, PCA, MDS, clustering, network models, Monte Carlo methods, introductory machine learning, and time-series analysis
Research Workflow	Literature review, problem decomposition, research proposal writing, experiment design, code-assisted development, result verification, technical writing, and presentation
Additional Strengths	Project initiation, product thinking, public communication, user feedback collection, interdisciplinary learning, and rapid prototyping

Research Interests

AI for Science, generative modeling, stochastic processes, world models, artificial life, quantitative finance, market structure, complex networks, scientific visualization, and intelligent systems for cognition and decision-making.

This resume is written to remain factual and verifiable while emphasizing research potential, project ownership, interdisciplinary ability, and execution.