Hongbo Ma

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Education

- **Tsinghua University** — Beijing, China
  B.S. in Computer Science and Technology (Major), GPA: 3.8/4.0 — *2022 – Present*
  - **Selected Coursework [Grade]**: Artificial Neural Networks [A], Fundamentals of Computer Graphics [A], Linear Algebra [A], Calculus A(2) [A], Probability and Statistics [A]
- **Tsinghua University** — Beijing, China
  Minor in Economics and Management, GPA: 3.8/4.0 — *2023 – Present*
  - **Selected Coursework [Grade]**: Political Economy [A], Investment [A]

Technical Skills

- **Programming Languages**: Python, C/C++, Swift, MATLAB, Rust, Java, TypeScript/JavaScript, SystemVerilog
- **AI Techniques**: Deep learning architectures (CNNs, RNNs, Transformers); Generative modeling (AR, VAE, GANs, Diffusion, Flow Matching); Reinforcement learning (PPO, DPO, GRPO); 3D vision; AI for drug discovery
- **Tools & Frameworks**: PyTorch, NumPy, MLX
- **Other Skills**: Paper illustration, LaTeX typesetting

Publications

- **Batched Contextual Reinforcement**
  ICML 2026, Under Review
  Bangji Yang, **Hongbo Ma***, Jiajun Fan, Ge Liu*
- **Towards High-Fidelity Mobile Video Synthesis with Slimmed Diffusion-Transformer**
  CVPR 2026, Under Review
  *Juncheng Yan, Qi Qin, **Hongbo Ma**, Le Zhuo, Yinan Liang, Yuandong Pu, Yi Xin, Wenzhao Zheng, Yu Qiao, Yihao Liu, Jiwen Lu*
- **StyleTailor: Towards Personalized Fashion Styling via Hierarchical Negative Feedback**
  AAAI 2026, Oral
  ***Hongbo Ma**, Fei Shen, Hongbin Xu, Xiaoce Wang, Gang Xu, Jinkai Zheng, Liangqiong Qu, Ming Li*
- **Empower Structure-based Molecule Optimization with Gradient Guidance**
  ICML 2025, Poster
  *Keyue Qiu, Yuxuan Song, Jie Yu, **Hongbo Ma**, Ziyao Cao, Mingyue Zheng, Hao Zhou, Wei-Ying Ma*
- **Redefining the Task of Bioactivity Prediction**
  ICLR 2025, Poster
  *Yanwen Huang, Bowen Gao, Yinjun Jia, **Hongbo Ma**, Wei-Ying Ma, Ya-Qin Zhang, Yanyan Lan*

Projects

- **Research on AI-Enabled Production and Dissemination of Traditional Culture Videos**
  National-Level College Students' Innovation and Entrepreneurship Training Program
  Hongbo Ma, Ailei Wang**

Research Experience

- **Siebel School of Computing and Data Science, UIUC** — Illinois, United States
  Research Intern — Advisor: Prof. Ge Liu — *Dec 2025 – Present*
  - **Efficient Math LLM Reasoning**: Proposed Batched Contextual Reinforcement (BCR), an RL framework derived from GRPO for multi-question prompting. BCR rewards only answer correctness and exploits the model's internal capability to solve question groups efficiently, reducing token usage by ∼50% without performance degradation.
  - **LLM Post-training**: Contributed to reward design and training pipeline development, building solid experience in post-training mathematical LLMs with TRL.
- **i-Vision Group @ Department of Automation, Tsinghua University** — Beijing, China
  Research Intern — Advisor: Prof. Jiwen Lu — *Sep 2025 – Oct 2025*
  - **On-device Video Generation**: Designed a compact Diffusion Transformer (DiT) architecture for mobile deployment under limited VRAM. Combined distillation techniques to achieve practical inference speed on phones with constrained compute.
  - **On-device Neural Network Development**: Built and optimized inference pipelines in Swift + MLX to overcome PyTorch limitations on edge devices.
- **Guangming Lab (Shenzhen)** — Shenzhen, China
  Research Intern — Advisor: Prof. Ming Li — *May 2025 – Aug 2025*
  - **Agent-related Research**: Designed a negative-feedback mechanism across base models and applied it to human-centric e-commerce via a multi-agent fashion system covering design, recommendation, virtual try-on, and evaluation. Established evaluation protocols for related tasks.
  - **End-to-end Publication Experience**: Served as sole first author and completed the full publication cycle, including writing, figure design, and rebuttal preparation.
- **GenSi Lab @ AIR Tsinghua** — Beijing, China
  Research Intern — Advisor: Prof. Hao Zhou — *Jul 2024 – Feb 2025*
  - **Generative Model Research**: Studied theoretical foundations of generative models (e.g., VAE, Diffusion) and implemented PyTorch-based model architectures.
  - **Molecular Optimization Framework**: Developed a Bayesian Flow Networks (BFN)-based framework for small-molecule optimization, addressing 3D spatial alignment and positional encoding challenges.
- **ATOM Lab @ AIR Tsinghua** — Beijing, China
  Research Intern — Advisor: Prof. Yanyan Lan — *Feb 2024 – Jun 2024*
  - **AI Pipeline Development**: Executed end-to-end AI workflows including data preprocessing, model training, and hyperparameter optimization.
  - **Data Analysis**: Implemented statistical evaluation metrics and visualization dashboards using Matplotlib.

Leadership

- **Xinya College, Tsinghua University**: President of Student Union

Honors & Awards

- **Outstanding Scientific and Technological Innovation Scholarship** — Tsinghua University
  Awarded for achievements in scientific and technological innovation — *2024 – 2025*
- **Outstanding Student Leader** — Tsinghua University
  Top 6 among 400+ students in Xinya College — *2023 – 2024*
- **Outstanding Social Work Scholarship** — Tsinghua University
  Awarded for leadership and community contributions — *2022 – 2023, 2023 – 2024, 2024 – 2025*
- **Second Prize Freshman Scholarship** — Tsinghua University
  Top 10 science-track students in provincial Gaokao — *2022*

Languages

- **Chinese**: Native
- **English**: Fluent, TOEFL: 96 (R26, L24, S21, W25)