Minghao Fu

PH.D. STUDENT · HALICIOĞLU DATA SCIENCE INSTITUTE

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Education

University of California, San Diego   *San Diego, CA, USA*
PH.D. STUDENT, HALICIOĞLU DATA SCIENCE INSTITUTE   *Aug 2025 – Present*
- Advisor: Biwei Huang

Carnegie Mellon University   *Pittsburgh, PA, USA*
VISITING STUDENT, CLEAR, PHILOSOPHY DEPARTMENT   *Jun 2024 – Nov 2024*
- Advisors: Peter Spirtes & Kun Zhang

Mohamed bin Zayed University of Artificial Intelligence (MBZUAI)   *Abu Dhabi, UAE*
M.S. IN MACHINE LEARNING   *Aug 2023 – Jun 2025*
- Advisor: Kun Zhang
- Thesis Committee: Kun Zhang (chair), Mingming Gong, Biwei Huang (external)

University of Electronic Science and Technology of China   *Chengdu, China*
B.S. IN SOFTWARE ENGINEERING   *Sep 2019 – Jun 2023*
- Graduated with Honor Research, Outstanding Undergraduate Thesis

Research Interests

My works cover world models (multi-modal learning, VLMs, temporal state-space models), decision-making (VLAs, reinforcement learning), and theoretical aspects of generative models.

Publications & Preprint

WORLD MODEL & REINFORCEMENT LEARNING

Minghao Fu, Fan Feng, Wenyuan Wang, Biwei Huang. *Superstructuring a Task-Sufficient World Model on Top of Visual Foundational Model.*
Manuscript.

Fan Feng[*], Yujia Zheng[*], **Minghao Fu**, Yongqiang Chen, Guangyi Chen, Kevin Patrick Murphy, Biwei Huang, Kun Zhang. *Learning Task–Sufficient World Models via Intervention–Curriculum Co-Design.*
Under Review.

Jinzhou Tang, Fan Feng, **Minghao Fu**, Wenjun Lin, Jing Yang, Biwei Huang, Keze Wang. *DreamSAC: Learning Hamiltonian World Models via Symmetry Exploration.*
Under Review.

Zijian Li[*], **Minghao Fu**[*], Junxian Huang, Yifan Shen, Ruichu Cai, Yuewen Sun, Guangyi Chen, Kun Zhang. *Towards Identifiability of Hierarchical Temporal Causal Representation Learning.*
NeurIPS 2025.

Fan Feng, Selena Ge, **Minghao Fu**, Zijian Li, Yujia Zheng, Zeyu Tang, Yingyao Hu, Biwei Huang, Kun Zhang. *Ada-Diffuser: Latent-Aware Adaptive Diffusion for Decision Making.*
NeurIPS 2025 EWMDM (*Embodied World Models for Decision Making*).

THEORY OF GENERATIVE MODEL

Minghao Fu, Biwei Huang, Zijian Li, Yujia Zheng, Ignavier Ng, Guangyi Chen, Yingyao Hu, Kun Zhang. *Learning General Causal Structures with Hidden Dynamic Processes for Climate Analysis.*
NeurIPS 2025 CauScien (*Uncovering Causality in Science*).

Zijian Li, Changze Zhou, **Minghao Fu**, Sanjay Manjunath, Fan Feng, Guangyi Chen, Yingyao Hu, Ruichu Cai, Kun Zhang. *Online Time Series Forecasting with Theoretical Guarantees.*

NeurIPS 2025.

Minghao Fu, Sheng Zhang, Guangyi Chen, Zijian Li, Yifan Shen, Fan Feng, Shaoan Xie, Kun Zhang. *From Comparison to Composition: Understanding Machine Cognition of Unseen Categories.* NeurIPS 2025 CogInterp (*Interpreting Cognition in Deep Learning Models*).

Loka Li[*], Wong Yu Kang[*], **Minghao Fu**, Guangyi Chen, Zhenhao Chen, Gongxu Luo, Yuewen Sun, Salman Khan, Peter Spirtes, Kun Zhang. *PersonaX: Multimodal Datasets with LLM-Inferred Behavior Traits.* Under Review.

Professional Experience

Cradle AI *Abu Dhabi, UAE*
Cofounder & CTO *Jun 2024 – Jun 2025*
- Co-founded an AI startup improving parenting and early education.
- Secured >**50,000 AED** seed funding from the Innovation & Entrepreneurship Center (IEC).
- Launched LetBabyTalk, an AI-powered parenting app with **200+ active users**, decoding infant cries and providing guidance.
- Led machine learning model development for baby cry detection (data collection, training, configuration) and oversaw app design and development for UX and performance.

Shanghai Artificial Intelligence Laboratory *Shanghai, China*
Research Intern, Ark NLP Group *Nov 2022 – Mar 2023*
- Mentor: Lingpeng Kong
- Research Topics: Non-Autoregressive Transformer, Linear Attention, Machine Translation

SAP *Chengdu, China*
Cloud Developer, Internship *Jan 2022 – Mar 2022*
- Hands-on experience with cloud architecture and environment setup.
- Integrated cloud services into applications to enhance functionality and performance.

Awards, Fellowships, & Honors

Jun 2025	**Machine Learning Citizen Award (1/37)**, MBZUAI
May 2023	**The First-ever Human Phenotype Project Hackathon, Rank-1st**, Weizmann Institute of Science & MBZUAI
May 2023	**Advanced Study Scholarship (< 5%)**, UESTC
Apr 2023	**Undergraduate High-Level Paper Award (<1%)**, UESTC
Jun 2023	**Honor Research Scholarship (< 1%)**, UESTC
2020-2023	**Excellent Student Scholarship (<10%)**, UESTC

Service & Professional Activities

Service & Outreach Volunteer, Neurips 2025 Dec 2025
Organizer, CradleAI LetBabyTalk Hackathon Dec 2024
Mentor, "Sadeeq" MBZUAI Buddy Aug 2024 – Jun 2025
Mentor, MBZUAI Undergraduate Research Internship Program (UGRIP) Jun 2024 – Aug 2024
Peer Review

Journals: IEEE TIP 2024
Conferences: CVPR 2026, WMW 2026, ICLR 2026, NeurIPS 2025, BMVC 2023

Skills

Deep Learning: PyTorch, Tensorflow, scikit-learn, Weights & Biases
Programming: Python, C++, Bash, MATLAB