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 research centers on **causal-driven world models** that integrate causal mechanisms into reinforcement learning to achieve reliable real-world generalization. This direction bridges **causal representation learning**, **world modeling**, and **agent discovery**, aiming to build interactive agents that learn and act through causality rather than correlation.

Publications & Preprint

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 (*The 39th Conference on Neural Information Processing Systems*).

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 (*The 39th Conference on Neural Information Processing Systems*).

Minghao Fu, Biwei Huang, Zijian Li, Yujia Zheng, Ignavier Ng, Guangyi Chen, Yingyao Hu, Kun Zhang. *Learning General Causal Structures with Hidden Dynamic Process for Climate Analysis.*
NeurIPS 2025 CauScien Workshop (*Uncovering Causality in Science*). Under Review at ICLR 2026.

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 Workshop (*Interpreting Cognition in Deep Learning Models*). Under Review at ICLR 2026.

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 Workshop (*Embodied World Models for Decision Making*). Under Review at ICLR 2026.

Loka Li, Ibrahim Aldarmaki, **Minghao Fu**, Wong Yu Kang, Yunlong Deng, Qiang Huang, Jing Yang, Jin Tian, Guangyi Chen, Kun Zhang. *How Effective is Your Rebuttal? Identifying Causal Models from the OpenReview System.*
NeurIPS 2025 CauScien Workshop (*Uncovering Causality in Science*). Under Review at ICLR 2026.

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 at ICLR 2026 (*The 14th International Conference on Learning Representations*).

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 at ICLR 2026 (*The 14th International Conference on Learning Representations*).

Minghao Fu[*], Danning Li[*], Aryan Gadhiya, Benjamin Lambright, Mohab Bahnassy, Mohamed Alowais, Saad El Dine ELEtter, Hawau Olamide Toyin, Haiyan Jiang, Kun Zhang, Hanan Aldarmaki. *Infant Cry Detection Using Causal Temporal Representation.*
Applied in LetBabyTalk, Cradle AI; ICASSP 2025 (*The 50th International Conference on Acoustics, Speech, and Signal Processing*).

Minghao Fu, Dongyang Zhang, Min Lei, Kun He, Changyu Li, Jie Shao. *Wide Feature Projection with Fast and Memory-Economic Attention for Efficient Image Super-Resolution.*
BMVC 2022 (*The 33rd British Machine Vision Conference*).

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	Nov 2024 – Dec 2024
Organizer, CradleAI LetBabyTalk Hackathon	Nov 2024 – 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: ICLR 2025, NeurIPS 2025, BMVC 2023

Skills

Languages: English (fluent), Chinese (native)
Deep Learning: PyTorch, Transformers, NumPy, Triton, JAX, scikit-learn
Programming: Python, C++, Bash, MATLAB
Research Tools: LaTeX, Jupyter, Weights & Biases, Git