

Mingjia Huo

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Education

University of California, San Diego (UCSD)

PhD in Electrical and Computer Engineering (GPA: 4.0)

- Advisor: Tajana Rosing, Hao Zhang

California, US

Sep 2023 - now

University of Illinois, Urbana-Champaign (UIUC)

MS in Electrical and Computer Engineering (GPA: 3.95)

- Advisor: Kirill Levchenko

Illinois, US

Aug 2020 - Dec 2022

Peking University

BS in Computer Science (Turing Class, GPA: 3.76, rank top 10%)

- Advisor: Qun Huang

Beijing, China

Sep 2016 - Jun 2020

Research Projects

Imgame Bench and Multi-Turn RL Training on Games

Feb 2025 - now

- Benchmarked state-of-the-art LLMs on six video games under various settings, both with and without structured harnesses to aid game-state understanding, and established Imgame bench leaderboard.
- Built LLM agents with visual perception and memory modules for interacting with game environments.
- Led multi-turn RL training of Qwen2.5-7B-Instruct on text-only Sokoban and Tetris, and demonstrated improved generalization on spatial reasoning, planning and multi-turn decision-making tasks.

LLM Watermarking

Sep 2023 - Feb 2024

- Applied LLM watermarks by adjusting LLM logits during inference time, and trained networks to adjust watermark strength based on previous tokens.
- Designed a multi-objective optimization framework to balance detectability and semantic coherence.
- Applied Gumbel-Softmax and a straight-through estimator to preserve gradients.
- Evaluated on C4 dataset and demonstrated improvements on the Pareto frontier of detection-semantics trade-off curves.
- Explained the rationality of learned parameters with respect to part-of-speech (POS) tags.

Multi-Modal Large Language Model for Protein Function Prediction

Jul 2023 - Oct 2024

- Applied multimodal learning (LLAVA) to perform instruction tuning based on Llama2-13B on one million QA data points.
- Evaluated the performance on open-text generations and classification tasks using F1-score, perplexity, BLEU, and SimCSE.
- Compared with BLASTp and ProtNLM (the protein annotation tools in UniProt), and demonstrated improved accuracy.

Publication

[1] Lanxiang Hu, Mingjia Huo, Yuxuan Zhang, et al. Imgame-Bench: How Good are LLMs at Playing Games? (Under Review)

[2] Mingjia Huo, Sai Ashish Somayajula, Youwei Liang, et al. Token-Specific Watermarking with Enhanced Detectability and Semantic Coherence for Large Language Models. International Conference on Machine Learning (ICML), 2024.

[3] Mingjia Huo, Han Guo, Xingyi Cheng, et al. Multi-Modal Large Language Model Enables Protein Function Prediction. (Under Review)

[4] Mingjia Huo, Maxwell Bland, Kirill Levchenko. All Eyes On Me: Inside Trackers' Exfiltration of PHI from Healthcare Providers' Online Systems. Proceedings of the 21th ACM Workshop on Privacy in the Electronic Society (WPES), 2022.

Work Experience

Google DeepMind - Gen AI

California, US

Student Researcher

Jun 2025 - Oct 2025

- Developed a benchmark based on 30 Atari games to evaluate high-FPS video understanding and decision-making of vision-language models (VLMs).
- Identified key failure modes of current VLMs, including movement detection errors and weak spatiotemporal reasoning.
- Trained Gemma models (4B-27B) with PPO on Atari games and analyzed their generalization behaviors.

Trova AI, Inc.

Illinois, US

AI Developer

May 2022 - April 2023

- Conducted customer segmentation using clustering methods for Snap-on, a US manufacturing company.
- Performed feature engineering on the purchase history of 6 million customers spanning from 2010 to 2022.
- Trained XGBoost model to predict individual purchase intention, and improved F1-score by 14%.

Skills

Tool PyTorch, Matlab, Kubeflow, Snowflake, Adobe Illustrator
Programming Python(Fluent), SQL(Fluent), C, C++

University Work Experience

2025	Teaching Assistant, DSC 204A: Scalable Data Systems	UCSD
2025	Teaching Assistant, ECE 268: Security of Hardware Embedded Systems	UCSD

Selected Awards

2019	Fellowship , Hui-Chun Chin and Tsung-Dao Lee Chinese Undergrad Research Endowment
2015	Silver Medal , Chinese Mathematical Olympiad
2015	Gold Medal , Chinese Girls' Mathematical Olympiad