Shibo Hao

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Education

University of California, San Diego **Sep. 2022 – Present**
Ph.D. in Data Science. Advisor: Zhiting Hu *La Jolla, CA*

Peking University **Sep. 2018 – Jun. 2022**
B.S. in Computer Science *Beijing, China*

Experience

MBZUAI Institute of Foundation Models **Oct. 2025 – Present**
Research Intern, post-training of a 70B fully open-source LLM *Remote*

Bloomberg L.P. **Jun. 2025 – Sep. 2025**
Data Scientist Intern (Bloomberg Data Science Fellow), web agents *New York, NY*

Meta FAIR Lab **Jun. 2024 – Jan. 2025**
Research Scientist Intern (Mentors: Yuandong Tian, Jason Weston), latent reasoning *Menlo Park, CA*

Research Interests

My research focuses on pushing the boundaries of machine reasoning in large language models. I develop latent-space reasoning methods (COCONUT, COCONUT-Theory, COCONUT-Dynamics), train LLMs to reason via reinforcement learning (Guru, OREO, FoR), build system-2 reasoning frameworks with world-model planning (RAP, LLM Reasoners, Pandora), and find better ways for LLM agents to interact with the world (ToolkenGPT, CocoaBench). I also work on large-scale post-training of LLMs for general reasoning ability (K2-V2, K2-Think).

Awards

Bloomberg Data Science Ph.D. Fellowship (3 recipients worldwide) 2024

Best Paper Award at SoCal NLP Symposium 2023

Outstanding Graduate Award, Peking University 2022

Leo KoGuan Scholarship (Top 1% at Peking University) 2022

First Prize, National Olympiad in Informatics in Provinces (NOIP) 2017

Selected Publications

(* indicates equal contribution)

Training Large Language Models to Reason in a Continuous Latent Space
Shibo Hao, Sainbayar Sukhbaatar, DiJia Su, Xian Li, Zhiting Hu, Jason Weston, Yuandong Tian
COLM 2025
Highlighted by Quanta Magazine

Reasoning with Language Model is Planning with World Model
Shibo Hao*, Yi Gu*, Haodi Ma, Joshua Jiahua Hong, Zhen Wang, Daisy Zhe Wang, Zhiting Hu
EMNLP 2023
Featured in State of AI Report 2023

ToolkenGPT: Augmenting Frozen Language Models with Massive Tools via Tool Embeddings
Shibo Hao, Tianyang Liu, Zhen Wang, Zhiting Hu
NeurIPS 2023 (Oral, 67 / 12345)
Best Paper Award at SoCalNLP 2023

LLM Reasoners: New Evaluation, Library, and Analysis of Step-by-Step Reasoning with Large Language Models
Shibo Hao*, Yi Gu*, Haotian Luo*, Tianyang Liu, Xiyan Shao, Xinyuan Wang, Shuhua Xie, Haodi Ma, Adithya Samavedhi, Qiyue Gao, Zhen Wang, Zhiting Hu
COLM 2024
2.3k Stars (as of Dec. 2025) at Github

Offline Reinforcement Learning for LLM Multi-Step Reasoning
Huaijie Wang*, **Shibo Hao***, Hanze Dong, Shenao Zhang, Yilin Bao, Ziran Yang, Yi Wu
Findings of ACL 2025
ICLR 2025 Workshop on Reasoning and Planning for LLMs (Oral, 7 / 181)

Revisiting Reinforcement Learning for LLM Reasoning from A Cross-Domain Perspective
Zhoujun Cheng*, **Shibo Hao***, Tianyang Liu*, *et al.*
NeurIPS 2025 Datasets & Benchmarks Track

Reasoning by Superposition: A Theoretical Perspective on Chain of Continuous Thought
Hanlin Zhu*, **Shibo Hao***, Zhiting Hu, Jiantao Jiao, Stuart Russell, Yuandong Tian
NeurIPS 2025

K2-V2: A 360-Open, Reasoning-Enhanced LLM
Zhengzhong Liu, Liping Tang, Linghao Jin, Haonan Li, Nikhil Ranjan, Desai Fan, Shaurya Rohatgi, Richard Fan, Omkar Pangarkar, Huijuan Wang, Zhoujun Cheng, Suqi Sun, Seungwook Han, Bowen Tan, Gurpreet Gosal, Xudong Han, Varad Pimpalkhute, **Shibo Hao**, Ming Shan Hee, Joel Hestness, Haolong Jia, Liqun Ma, Aaryamonvikram Singh, Daria Soboleva, Natalia Vassilieva, Renxi Wang, Yingquan Wu, Yuekai Sun, Taylor Killian, Alexander Moreno, John Maggs, Hector Ren, Guowei He, Hongyi Wang, Xuezhe Ma, Yuqi Wang, Mikhail Yurochkin, Eric P. Xing
arXiv preprint arXiv:2512.06201, 2025

K2-Think: A Parameter-Efficient Reasoning System
Zhoujun Cheng*, Richard Fan*, **Shibo Hao***, Taylor W. Killian*, Haonan Li*, Suqi Sun*, *et al.*
arXiv preprint arXiv:2509.07604, 2025

CocoaBench: An Evaluation Framework for General Agents with Compositional Cognitive Abilities
Shibo Hao*, Zhining Zhang*, Zhiqi Liang*, Tianyang Liu*, Zilong Wang*, *et al.*
Blog Post, https://cocoabench.github.io/

Pandora: Towards General World Model with Natural Language Actions and Video States
Jiannan Xiang*, Guangyi Liu*, Yi Gu*, Qiyue Gao, Yuting Ning, Yuheng Zha, Zeyu Feng, Tianhua Tao, **Shibo Hao**, Yemin Shi, Zhengzhong Liu, Eric P. Xing, Zhiting Hu
arXiv preprint arXiv:2406.09455, 2024

Flow of Reasoning: Efficient Training of LLM Policy with Divergent Thinking
Fangxu Yu, Lai Jiang, Haoqiang Kang, **Shibo Hao**, Lianhui Qin
ICML 2025

LLM Pretraining with Continuous Concepts
Jihoon Tack, Jack Lanchantin, Jane Yu, Andrew Cohen, Ilia Kulikov, Janice Lan, **Shibo Hao**, Yuandong Tian, Jason Weston, Xian Li
arXiv preprint arXiv:2502.08524, 2025

Emergence of Superposition: Unveiling the Training Dynamics of Chain of Continuous Thought
Hanlin Zhu, **Shibo Hao**, Zhiting Hu, Jiantao Jiao, Stuart Russell, Yuandong Tian
arXiv preprint arXiv:2509.23365, 2025

Technical Skills

Programming: Python, C++, HTML, JavaScript

Deep Learning: Pytorch, Transformers, Distributed Training (e.g., FSDP), Accelerated Inference (SGLang/vLLM)

Languages: English – Fluent, Chinese – Native

Services

Reviewer for ICML (2024 - 2025), NeurIPS (2024), ICLR (2025), and ACL-ARR (Oct. 2023 - Now)