

Chi Han

PHD STUDENT · UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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Research Vision

My long-term research goal is to develop **the science of language models (LMs)** by asking and answering the following questions: What role does each hidden representation play in LMs? When will they malfunction or cause counterintuitive phenomena? How can we adapt the mechanisms to transcend their inherent limits and better serve the downstream tasks? To this end, I have been working on a theoretical and empirical analysis of LLM hidden representations LMs, with the aim of providing insights and developing useful tools and cures for LMs.

Education

University of Illinois at Urbana-Champaign

PHD OF COMPUTER SCIENCE

- Advisor: Prof. Heng Ji

Urbana, IL, USA

2021 - present

Tsinghua University

UNDERGRADUATE IN YAO CLASS

- Thesis Advisor: Prof. Chongjie Zhang

Beijing, China

2016-2020

Massachusetts Institute of Technology

VISITING STUDENT IN DEPARTMENT OF BRAIN AND COGNITIVE SCIENCES

- Advisor: Prof. Joshua Tenenbaum, Prof. Jiajun Wu, Prof. Chuang Gan, Jiayuan Mao

Boston, MA, USA

2019

Awards & Fellowships

- 2024 **ACL 2024 Outstanding Paper Award**, ACL
- NAACL 2024 Outstanding Paper Award**, NAACL
- Amazon AICE PhD Fellowship**, Amazon-Illinois AICE Center (Fall 2024 - Spring 2025)
- 2016-2019 **Yao Class Scholarship**, Tsinghua University
- 2017-2019 **Community Service Award**, Tsinghua University
- 2016 **Second Prize, Freshman Scholarship**, Tsinghua University
- Third Prize, 'Baidu Star of the Future' Scholarship**, Tsinghua University

Publications

LM-Infinite: Zero-Shot Extreme Length Generalization for Large Language Models

Chi Han, Qifan Wang, Wenhan Xiong, Yu Chen, Heng Ji, and Sinong Wang.

North American Chapter of the Association for Computational Linguistics (NAACL 2024). (**NAACL Outstanding Paper Award**)

Word Embeddings Are Steers for Language Models

Chi Han, Jialiang Xu, Manling Li, Yi Fung, Chenkai Sun, Nan Jiang, Tarek Abdelzaher, and Heng Ji.

Association for Computational Linguistics (ACL 2024). (**ACL Outstanding Paper Award**)

Explaining Emergent In-Context Learning as Kernel Regression

Chi Han, Ziqi Wang, Han Zhao, and Heng Ji.

arXiv preprint arXiv:2305.12766 (2023)

Zero-Shot Classification by Logical Reasoning on Natural Language Explanations

Chi Han, Hengzhi Pei, Xinya Du, and Heng Ji.

Findings of the Association for Computational Linguistics (ACL 2023)

CREATOR: Disentangling Abstract and Concrete Reasonings of Large Language Models through Tool Creation

Qian, Cheng, [Chi Han](#), Yi R. Fung, Yujia Qin, Zhiyuan Liu, and Heng Ji.
Findings of the Association for Computational Linguistics (EMNLP 2023)

Understanding the Effect of Data Augmentation on Knowledge Distillation

Wang, Ziqi, [Chi Han](#), Wenxuan Bao, and Heng Ji.
arXiv preprint arXiv:2305.12565 (2023)

RCOT: Detecting and Rectifying Factual Inconsistency in Reasoning by Reversing Chain-of-Thought

Xue, Tianci, Ziqi Wang, Zhenhailong Wang, [Chi Han](#), Pengfei Yu, and Heng Ji.
arXiv preprint arXiv:2305.11499 (2023)

Logical Entity Representation in Knowledge-Graphs for Differentiable Rule Learning

[Chi Han](#), Qizheng He, Charles Yu, Xinya Du, Hanghang Tong, and Heng Ji.
The Eleventh International Conference on Learning Representations (ICLR 2022)

Learning Shared Semantic Space for Speech-to-Text Translation

[Chi Han](#), Mingxuan Wang, Heng Ji, and Lei Li.
Findings of the Association for Computational Linguistics: (ACL-IJCNLP 2021)

Birds of a Feather Flock Together: A Close Look at Cooperation Emergence via Multi-Agent RL

Dong, Heng, Tonghan Wang, Jiayuan Liu, [Chi Han](#), and Chongjie Zhang.
arXiv preprint arXiv:2104.11455 (2021)

Visual Concept-Metaconcept Learning

[Chi Han](#), Jiayuan Mao, Chuang Gan, Josh Tenenbaum, and Jiajun Wu.
Advances in Neural Information Processing Systems 32 (NeurIPS 2019)

Invited Talks

Towards A Physiology of Language Model Representations

Guest Lecture, Case West Reserve University, 2024

The Quest for A Science of LMs

Guest Lecture, University of Illinois at Urbana-Champaign CS546 Course, 2024

Towards A Physiology of Language Model Representations

Invited Talk, UIUC ML Seminar, 2024

Media Coverage

CS PhD student Chi Han diagnoses language models

UIUC CS News, 2024

Professional Service

Tutorials

“The Quest for A Science of Language Models”, [Chi Han](#), Heng Ji, AAAI 2025 Tutorial

Area Chair

EMNLP Demo Track, 2024

Journal Reviewer

IEEE Transactions on Circuits and Systems for Video Technology (IEEE TCSVT)
IEEE Transactions on Neural Networks and Learning Systems (IEEE TNNLS)
Transactions on Intelligent Systems and Technology (TIST)

Program Committee Member

ACL (2023-), EMNLP (2023-), NAACL (2023-), EMNLP Demo (2024), ICLR (2025), AISTATS(2025)

Seminar Organization

UIUC-NLP Seminar (2023-2024), Co-organizer

Teaching and Mentoring

TEACHING

2024 **Teaching Assistant**, UIUC CS546

MENTORED STUDENTS

- 2024 **Xuehang Guo**, LLM agent (in submission), Pittsburgh University
Cheng Li, Cultural bias in LLM (in submission), Microsoft Research Asia
- 2023 **Jiaxin Qin**, “Creator” tool learning (EMNLP 2024 Findings), Remin University → UIUC CS MSCS
Ziyi Gao, Curing direct preference learning (in submission), Tsinghua University → Deepseek AI
- 2022 **Cheng Qian**, Knowledge editing (EMNLP 2023 Findings), Tsinghua University → UIUC CS Ph.D.

Working Experience

Amazon AI

Seattle, WA

APPLIED SCIENTIST INTERN

Summer 2024

- Project: A Comprehensive Benchmark for Large Language Model Multi-Turn Capabilities
- Advisor: Xin Liu, Qingyu Yin

Meta GenAI

Bellevue, WA

RESEARCH SCIENTIST INTERN

Summer 2023

- Project: LM-Infinite: Zero-Shot Extreme Length Generalization for Large Language Models (NAACL 2024 Outstanding Paper)
- Advisor: Sinong Wang, Qifan Wang, Wenhan Xiong, Yu Chen

ByteDance AI Lab

Shanghai, China

RESEARCH INTERN ON NATURAL LANGUAGE PROCESSING

2020-2021

- Project: Learning Shared Semantic Space for Speech-to-Text Translation. (ACL 2021 Findings)
- Advisor: Prof. Lei Li (now Assistant Professor at CMU)