Yifei He | Curriculum Vitae

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I am interested in making foundation models and agents learn from multiple sources and tasks in an efficient, robust and scalable manner. My research involves the full life cycle of LLMs:

- **Pretraining**: Derived optimal data mixtures through multilingual scaling laws.
- **Post-training:** Enhanced post-training efficiency with model merging, PEFT and unsupervised training.
- **Agentic AI:** Trained Computer Use Agents via scalable data synthesis without human annotation.

Education

University of Illinois Urbana-Champaign (UIUC) — **Urbana, IL, USA**
Ph.D. in Computer Science — *Aug 2021 - May 2026 (Expected)*

University of Michigan (UM) — **Ann Arbor, MI, USA**
B.S.E. in Data Science, minor in Mathematics — *Aug 2019 - Apr 2021*
Summa Cum Laude

Shanghai Jiao Tong University (SJTU) — **Shanghai, China**
B.S.E. in Electrical and Computer Engineering — *Sept 2017 - Aug 2021*

Industry Experience

Microsoft — **Redmond, WA, USA**
Applied Scientist Intern, Turing — *May 2025 - Aug 2025*
- Improved reasoning capabilites of computer-use agent.

Research Intern, GenAI — *Aug 2024 - Feb 2025*
- Improved efficiency of Mixture-of-Experts (MoE) models.

Applied Scientist Intern, Turing — *May 2024 - Aug 2024*
- Developed scaling laws for multilingual language models.

Amazon — **Seattle, WA, USA**
Applied Scientist Intern, Search Science and AI — *May 2023 - Aug 2023*
- Improved large-scale multi-task tuning of foundation models.
- Developed a vision-language retrieval foundation model with instruction tuning.

Publications (* denotes equal contribution)

[1] **WebSTAR: Scalable Data Synthesis for Computer Use Agents with Step-Level Filtering.**
Yifei He*, Pranit Chawla*, Yaser Souri, Subhojit Som, Xia Song
Under review.

[2] **MergeBench: A Benchmark for Merging Domain-Specialized LLMs.**
Yifei He, Siqi Zeng, Yuzheng Hu, Rui Yang, Tong Zhang, Han Zhao
Neural Information Processing Systems Datasets and Benchmarks Track. **(NeurIPS 2025)**

[3] **Efficiently Editing Mixture-of-Experts Models with Compressed Experts.**
Yifei He, Yang Liu, Chen Liang, Hany Awadalla.
Conference on Empirical Methods in Natural Language Processing 2025. **(EMNLP 2025 Findings)**

[4] **Scaling Laws for Multilingual Language Models.**
Yifei He, Alon Benhaim, Barun Patra, Praneetha Vaddamanu, Sanchit Ahuja, Parul Chopra, Vishrav Chaudhary, Han Zhao, Xia Song.
Meeting of the Association for Computational Linguistics. **(ACL 2025 Findings)**

[5] **Task Vector Bases: A Unified and Scalable Framework for Compressed Task Arithmetic.**
Siqi Zeng, **Yifei He**, Meitong Liu, Weiqiu You, Yifan Hao, Yao-Hung Hubert Tsai, Makoto Yamada, Han Zhao.
Under review.

[6] **Towards Understanding the Fragility of Multilingual LLMs against Fine-Tuning Attacks.**
Samuele Poppi, Zheng-Xin Yong, **Yifei He**, Bobbie Chern, Han Zhao, Aobo Yang, Jianfeng Chi.
The Nations of the Americas Chapter of the Association for Computational Linguistics 2025. **(NAACL 2025 Findings)**

[7] **Localize-and-Stitch: Efficient Model Merging via Sparse Task Arithmetic.**
Yifei He, Yuzheng Hu, Yong Lin, Tong Zhang, Han Zhao.
Transactions of Machine Learning Research. **(TMLR, J2C Certificate)**

[8] **Semi-Supervised Reward Modeling via Iterative Self-Training.**
Yifei He*, Haoxiang Wang*, Ziyan Jiang, Alexandros Papangelis, Han Zhao.
Conference on Empirical Methods in Natural Language Processing 2024. **(EMNLP 2024 Findings)**

[9] **Robust Multi-Task Learning with Excess Risks.**
Yifei He, Shiji Zhou, Guojun Zhang, Hyokun Yun, Yi Xu, Belinda Zeng, Trishul Chilimbi, Han Zhao.
International Conference on Machine Learning. **(ICML 2024)**

[10] **Gradual Domain Adaptation: Theory and Algorithms.**
Yifei He*, Haoxiang Wang*, Bo Li, Han Zhao.
Journal of Machine Learning Research. **(JMLR)**

[11] **Efficient Modality Selection in Multimodal Learning.**
Yifei He*, Runxiang Cheng*, Gargi Balasubramaniam*, Yao-Hung Hubert Tsai, Han Zhao.
Journal of Machine Learning Research. **(JMLR)**
(Extended version of publication [12].)

[12] **Greedy Modality Selection via Approximate Submodular Maximization.**
Runxiang Cheng*, Gargi Balasubramaniam*, **Yifei He***, Yao-Hung Hubert Tsai, Han Zhao.
Conference on Uncertainty in Artificial Intelligence. **(UAI 2022)**

[13] **Conformer-RL: A Deep Reinforcement Learning Library for Conformer Generation.**
Runxuan Jiang, Tarun Gogineni, Joshua Kammeraad, **Yifei He**, Ambuj Tewari, Paul Zimmerman.
Journal of Computational Chemistry. **(JCC)**

[14] **A Hierarchical Approach to Multi-Event Survival Analysis.**
Donna Tjandra, **Yifei He**, Jenna Wiens.
AAAI Conference on Artificial Intelligence. **(AAAI 2021)**

Professional Service

Reviewer: UAI, NeurIPS, ICLR, AISTATS, ICML, TMLR, ACL

Teaching Experience

Teaching assistant at UIUC
- CS 598 Foundations of Data Science — 2025 Fall
- CS 357 Numerical Methods I — 2022 Fall, 2022 Spring
- CS 441 Applied Machine Learning — 2021 Fall

Teaching assistant at UM
- EECS 445 Intro to Machine Learning — 2020 Fall

Skills

Framework: TRL, PyTorch, DeepSpeed, TensorFlow, Keras, Gym