Yuheng Wu

Curriculum Vitae

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Research Interests

Reasoning in large language models (LLMs), efficient test-time methods and scaling laws, LLMs for programming, verification and formal methods, machine learning systems, and hardware-software co-design.

Education

09.2024 – now **Stanford University**, Stanford, California, USA.
Master of Science in Electrical Engineering, GPA: 4.05

09.2020 – 06.2024 **Wuhan University**, Wuhan, Hubei, P.R.China.
Bachelor of Engineering in Electronic Information Engineering, GPA: 3.98

Publications

Preprint

Preprint Yuzong Chen, Chao Fang, Xilai Dai, **Yuheng Wu**, Thierry Tambe, Marian Verhelst, and Mohamed Abdelfattah. "Unlocking Efficient Processing-In-Memory for Edge LLM Inference with Hybrid Numerical Formats," *Arxiv Preprint*, Nov. 2025
`https://arxiv.org/abs/2511.06838`

Preprint **Yuheng Wu**, Azalia Mirhoseini, and Thierry Tambe. "On the Role of Temperature Sampling in Test-Time Scaling," *Arxiv Preprint*, Oct. 2025
`https://arxiv.org/abs/2510.02611`

Conference

EMNLP'25 **Yuheng Wu**, Jianwen Xie, Denghui Zhang, and Zhaozhuo Xu. "DEL-ToM: Inference-Time Scaling for Theory-of-Mind Reasoning via Dynamic Epistemic Logic," *in Proceedings of the Conference on Empirical Methods in Natural Language Processing*, Nov. 2025.
`https://aclanthology.org/2025.emnlp-main.573`

EMNLP'25 Anjiang Wei*, **Yuheng Wu***, Yingjia Wan, Tarun Suresh, Huanmi Tan, Zhanke Zhou, Sanmi Koyejo, Ke Wang, and Alex Aiken. "SATBench: Benchmarking LLMs' Logical Reasoning via Automated Puzzle Generation from SAT Formulas," *in Proceedings of the Conference on Empirical Methods in Natural Language Processing*, Nov. 2025.
`https://aclanthology.org/2025.emnlp-main.1716`

COLM'25 Anjiang Wei, Tarun Suresh, Jiannan Cao, Naveen Kannan, **Yuheng Wu**, Kai Yan, Thiago S. F. X. Teixeira, Ke Wang, and Alex Aiken. "CodeARC: Benchmarking Reasoning Capabilities of LLM Agents for Inductive Program Synthesis," *in Proceedings of the Conference on Language Modeling*, Oct. 2025.
`https://openreview.net/forum?id=Q5pVZCrrKr`

CVPR'24	Yang Yu*, Erting Pan*, Xinya Wang, **Yuheng Wu**, Xiaoguang Mei, and Jiayi Ma. "Unmixing before Fusion: A Generalized Paradigm for Multi-Source-Based Hyperspectral Image Synthesis," *in Proceedings of the Conference on Computer Vision and Pattern Recognition*, Jun. 2024.
	https://ieeexplore.ieee.org/document/10656158

Journal

NPJ AI	**Yuheng Wu**, Wentao Guo, Zirui Liu, Heng Ji, Zhaozhuo Xu, and Denghui Zhang. "How Large Language Models Encode Theory-of-Mind: A Study on Sparse Parameter Patterns," *Nature Partner Journals on Artificial Intelligence*, 1, 20, 2025.
	https://www.nature.com/articles/s44387-025-00031-9

Workshop

NeurIPS'25	**Yuheng Wu** and Thierry Tambe. "On the Role of Temperature Sampling in Test-Time Scaling," *in Efficient Reasoning Workshop and Foundations of Reasoning in LMs Workshop at the Conference on Neural Information Processing Systems*, Dec. 2025
ICML'25	**Yuheng Wu**, Jianwen Xie, Denghui Zhang, and Zhaozhuo Xu. "DEL-ToM: Inference-Time Scaling for Theory-of-Mind Reasoning via Dynamic Epistemic Logic," *in Efficient Systems for Foundation Models Workshop at the International Conference on Machine Learning*, Jul. 2025
ICLR'25	**Yuheng Wu**, Wentao Guo, Zirui Liu, Zhaozhuo Xu, and Denghui Zhang. "Sensitivity Meets Sparsity: The Impact of Extremely Sparse Parameter Patterns on Theory-of-Mind of Open-Source Large Language Models," *in Open Science for Foundation Models Workshop at the International Conference on Learning Representations*, Apr. 2025.

Experience

05.2025 – now	Research Intern, Test-Time Methods for LLMs and Enbodied AI, Stanford University Mentor/Collaborator: **Thierry Tambe** and **Azalia Mirhoseini**
	• Revealed the saturation limit of sample-based test-time scaling and introduced temperature scaling as a new axis to unlock LLMs' reasoning potential, with an efficient multi-temperature voting method to reduce inference overhead. [Preprint]
03.2025 – 09.2025	Research Intern, Logical Reasoning and Formal Methods, Stanford University Mentor/Collaborator: **Alex Aiken** and **Sanmi Koyejo**
	• Built a SAT-solver-grounded logical puzzle generation and evaluation framework with formal verification, exposing systematic failures of LLMs in search-based logical reasoning. [EMNLP'25]
	• Developed a data-generation pipeline for supervised fine-tuning (SFT) on inductive reasoning, enabling LLMs to learn inductive program synthesis through differential testing feedback. [COLM'25]
06.2024 – 09.2025	Research Intern, Reasoning and Interpretability, Stevens Institute of Tech. & UIUC Mentor/Collaborator: **Zhaozhuo Xu**, **Denghui Zhang**, and **Heng Ji**
	• Developed a formal-method-based framework for inference-time scaling of theory-of-mind reasoning in LLMs, grounded in dynamic epistemic logic; enabled verifiable belief-trace reasoning via a learned process belief model that supervises step-level belief updates during inference. [EMNLP'25]
	• Identified Fisher-informative sparse parameters in LLMs that modulate query-key angles in attention heads, revealed RoPE-related effects, and linked these mechanisms to downstream theory-of-mind reasoning capabilities. [NPJ AI]

06.2023 – 05.2024 Research Intern, Multi-Spectral Computational Imaging, Wuhan University
Mentor/Collaborator: **Xiaoguang Mei** and **Jiayi Ma**
- Designed an asymmetric autoencoder with physical constraints in the latent space, integrating RGB inputs with diffusion and normalizing-flow models to synthesize credible and diverse hyperspectral data. [CVPR'24]

Honors and Awards

2024	Outstanding Graduate Scholarship, Wuhan University
2021, 2023	National Scholarship, Ministry of Education, P.R.China
2021, 2022, 2023	Merit Student, Wuhan University
2023	Outstanding Young Volunteer, Wuhan University
2022	Yu Gang - Song Xiao Scholarship, Wuhan University

Service

Reviewer CVPR 2026, ICLR 2026, NeurIPS 2025, IEEE Transactions on Image Processing, Journal of Artificial Intelligence Research, IEEE Transactions on Neural Networks and Learning Systems, Pattern Recognition