

Minglu Zhao

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ACADEMIC **University of California, Los Angeles (UCLA)**
BACKGROUND *Ph.D. Candidate in Statistics* Sep 2021 - 2026 (Expected)
M.S. in Statistics Sep 2021 - Jun 2023
GPA: 4.0 / 4.0; Co-advised by Prof. Ying Nian Wu and Prof. Tao Gao
B.S. Statistics, B.S. Cognitive Science, minor in Mathematics Sep 2017 - Dec 2020
GPA: 3.9 / 4.0; *Magna Cum Laude*

RESEARCH INTERESTS Language models, Decision making, Generative models, Representation learning

SELECTED PUBLICATIONS (* denotes equal contributions)

Deqian Kong*, **Minglu Zhao***, Dehong Xu*, Bo Pang, Shu Wang, Edouardo Honig, Zhangzhang Si, Chuan Li, Jianwen Xie, Sirui Xie, Ying Nian Wu. “Scalable Language Models with Posterior Inference of Latent Thought Vectors.” Preprint. *In submission to ICML 2025*.

Qian Long*, Ruoyan Li*, **Minglu Zhao***, Tao Gao, Demetri Terzopoulos. “Inverse Attention Agent in Multi-Agent System.” *International Conference on Learning Representations (ICLR)*, 2025.

Minglu Zhao, Dehong Xu, Wenhao Zhang, Ying Nian Wu, “A minimalistic representation model for head direction system.” *NeurIPS 2024 Workshop on Symmetry and Geometry in Neural Representations*

Deqian Kong*, Dehong Xu*, **Minglu Zhao***, Bo Pang, Jianwen Xie, Andrew Lizarraga, Yuhao Huang, Sirui Xie, Ying Nian Wu. “Latent Plan Transformer: Planning as Latent Variable Inference.” *Conference on Neural Information Processing Systems (NeurIPS)*, 2024.

Shaozhe Cheng, **Minglu Zhao**, Ning Tang, Yang Zhao, Jifan Zhou, Mowei Shen, and Tao Gao. “Intention beyond desire: Spontaneous intentional commitment regulates conflicting desires.” *Cognition* 238 (2023): 105513.

Minglu Zhao, Ning Tang, Annya L. Dahmani, Yixin Zhu, Federico Rossano, and Tao Gao. “Sharing rewards undermines coordinated hunting.” *Journal of Computational Biology* 29, no. 9 (2022): 1022-1030.

Ning Tang, Siyi Gong, **Minglu Zhao**, Chenya Gu, Jifan Zhou, Mowei Shen, and Tao Gao. “Exploring an imagined “we” in human collective hunting: Joint commitment within shared intentionality.” *Annual Conference of the Cognitive Science Society (CogSci)*, 2022.

Stephanie Stacy, Chenfei Li, **Minglu Zhao**, Yiling Yun, Qingyi Zhao, Max Kleiman-Weiner, and Tao Gao. “Modeling communication to coordinate perspectives in cooperation.” *Annual Conference of the Cognitive Science Society (CogSci)*, 2021.

- RESEARCH EXPERIENCE **Natera, Inc.** Feb 2025 - present
Research scientist intern, Advisor: Dr. Zijun Frank Zhang
- Designing and pretraining an efficient foundation model of genomics data.
- GE Research** Jun 2023 - Sep 2023
Research scientist intern, Advisor: Dr. Peter Tu
- Designed a real-time video understanding framework that extracts and classifies predicates and actions from real-world video, enabling automated plan recognition and high-level goal inference in dynamic settings.
- UCLA, Department of Statistics** Sep 2021 - present
Research assistant, Advisors: Prof. Ying Nian Wu and Prof. Tao Gao
- Language modeling with latent thought representations
 - Proposed *Latent-Thought Language Models (LTMs)*, incorporating explicit latent thought vectors and a dual-rate variational Bayes framework. This approach achieves superior sample efficiency, emergent in-context reasoning, and outperforms conventional autoregressive models in zero-shot and few-shot language modeling.
 - Decision-making and robotics as latent plan inference
 - Planning as latent variable inference: Developed the *Latent Plan Transformer*, an unsupervised solution to decision-making via sequence modeling by inferring a latent variable from a target return to guide policy execution as a plan.
 - Iterative latent plan refinement for robotics control: developed a real-time replanning method using a few Langevin steps at each timestep, enhancing robustness under uncertainty while remaining computationally efficient.
 - Multi-agent RL inspired by Theory-of-Mind
 - Proposed *Imagined We*, a Bayesian Theory-of-mind approach that bridges centralized and decentralized multi-agent systems via a unified “We” perspective, enabling superior cooperation and more human-like behavior.
 - Developed the *Inverse Attention Agents* that leverage an attention mechanism to dynamically infer and adjust to other agents’ goals in multi-agent environments, enhancing cooperation, competition, and human-agent interactions.
- ORAL PRESENTATIONS
- *Conference of the Cognitive Science Society (CogSci), 2022 (Oral Presentation)*
Exploring an Imagined “We” in Collective Hunting: Joint Commitment within Shared Intentionality
 - *RSS Workshop on Social Intelligence in Humans and Robots, 2022 (Spotlight)*
Exploring an Imagined “We” in Collective Hunting: Joint Commitment within Shared Intentionality
 - *Conference of the Cognitive Science Society (CogSci), 2021 (Oral Presentation)*
Modeling Animal Coordinated Hunting with Reinforcement Learning
 - *ICRA Workshop on Social Intelligence in Humans and Robots, 2021 (Spotlight)*
Modeling Communication to Coordinate Perspectives in Cooperation
 - *ICRA Workshop on Social Intelligence in Humans and Robots, 2021 (Spotlight)*
Modeling Animal Coordinated Hunting with Reinforcement Learning
- SKILLS *Programming Skills:* Python, PyTorch, TensorFlow, HuggingFace, Latex, C++

AWARDS	<i>Graduate Student Fellowship, UCLA</i>	2021 - 2026
	<i>Doctoral Student Travel Award, UCLA</i>	2021 - 2026
	<i>UCLA Dean's Honors List</i>	2017 - 2021

PROFESSIONAL **Peer-reviewed Journals and Conferences**
SERVICES

Transactions on Machine Learning Research (TMLR)
International Conference on Machine Learning (ICML)
International Conference on Learning Representations (ICLR)
Conference on Neural Information Processing Systems (NeurIPS)
International Conference on Artificial Intelligence and Statistics (AISTATS)
Annual Conference of the Cognitive Science Society (CogSci)