

Lance Ying

AFFILIATION

School of Engineering and Applied Sciences, Harvard
Department of Brain and Cognitive Science, MIT

Contact: lanceying@seas.harvard.edu
lanceying@mit.edu

SUMMARY

PhD Student in Computer Science with interests in AI, Cognitive Science and Human-AI Interaction, especially in scalable multimodal models of cooperative agents.

EDUCATION

Harvard University August 2022 - Present
PhD Candidate in Computer Science Cambridge, MA
Advisor: Joshua Tenenbaum, Samuel Gershman

Harvard University August 2022 - May 2024
S.M. in Computer Science, GPA: 3.9/4.0 Cambridge, MA

University of Michigan – Ann Arbor Graduated Dec 2021
Bachelor of Science, Quadruple Major in Honors Computer Science, Mathematics, Ann Arbor, MI
Honors Psychology, and Honors Cognitive Science

GPA: 3.9/4.0, High Distinction

RESEARCH INTERESTS

Computational Cognitive Science, Multimodal reasoning, Social Cognition, Multi-agent Systems, Human-AI Interaction, Cooperative AI

PAPER UNDER REVIEW

* Equal contribution

Ying, L.*, Hillel, A.*, Truong., R.*, Mansinghka., V., Tenenbaum, J. B., Zhi-Xuan, T. (2025). Belief Attribution as Mental Explanation: The Role of Accuracy, Informativity, and Causality

Ying, L.*, Xu, D.*, Zhang, A., Collins, K. M., Siegel, M., Tenenbaum, J. B. (2025). What's in the box? Reasoning about Unseen Objects from Multimodal Cues

Ying, L., Truong, R., Tenenbaum, J., & Gershman, S. J. (2025). Adaptive Social Learning using Theory of Mind. *PsyArxiv*, https://osf.io/preprints/psyarxiv/4ctjp_v2

Ying, L., Collins, K. M., Wong, L., Sucholutsky, I., Liu, R., Weller, A., Shu, T., Griffiths, T. L., & Tenenbaum, J. B. (2025). On benchmarking human-like intelligence in machines.

Kim, H., Sclar, M., Zhi-Xuan, T., **Ying, L.**, Levine, S., Liu, Y., Tenenbaum, J. B., & Choi, Y. (2025). Hypothesis-driven theory-of-mind reasoning for large language models. arXiv. Retrieved from <https://arxiv.org/abs/2502.11881>

Ying, L., Liu, X. J.*, Aarya, S.*, Fang, Y., Tellex, S., Tenenbaum, J. B., & Shu, T. (2024) SIFTtoM: Robust Spoken Instruction Following through Theory of Mind.

PUBLICATION

Walsh, S., Wang, Q., **Ying, L.**, Theory of Mind in Human-AI Interaction (2025)., in *Handbook of Human-centered AI (to appear)*

Ying, L.*, Zhi-Xuan, T*, Wong, L., Mansinghka, V., & Tenenbaum, J. B. (2024). Understanding Epistemic Language with a Bayesian Theory of Mind. *Transactions of the Association of Computational Linguistics (to appear)*

Ying, L., Jha, K., Aarya, S., Tenenbaum, J. B., Torralba, A., & Shu, T. (2024). GOMA: Proactive Embodied Cooperative Communication via Goal-Oriented Mental Alignment. *IROS 2024*

Ying, L.*, Zhi-Xuan, T*, Wong, L., Mansinghka, V., & Tenenbaum, J. B. (2024). Grounding Language about Belief in a Bayesian Theory of Mind. In *Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 46, No. 46).

Zhi-Xuan, T*, **Ying, L.***, Mansinghka, V., & Tenenbaum, J. B. (2024). Pragmatic Instruction Following and Goal Assistance via Cooperative Language-Guided Inverse Planning. *AAMAS 2024*

Ying, L., Gajos, K. (2024), Communicating Common Goal Knowledge Improves Trust Calibration in Human-AI Collaboration. *2024 CHI workshop on Theory of Mind in Human-AI Interactions*

Ying, L., Collins, K. M., Wei, M., Zhang, C. E., Zhi-Xuan, T., Weller, A., Tenenbaum, J. B., & Wong, L. (2023). The Neuro-Symbolic Inverse Planning Engine (NIPE): Modeling Probabilistic Social Inferences from Linguistic Inputs. *2023 ICML Workshop on Theory of Mind in Communicating Agents*

Ying, L.*, Zhi-Xuan, T. *, Mansinghka, V., & Tenenbaum, J. B. (2023). Inferring the Goals of Communicating Agents from Actions and Instructions. *Proceeding of AAAI Symposium Series, 2023*

Ying, L., Michal, A., & Zhang, J. (2022). A Bayesian Drift-Diffusion Model of Schachter-Singer's Two-Factor Theory of Emotion. In *Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 44, No. 44).

HONORS, AWARDS & GRANTS

2022 – Harvard SEAS Fellowship

2021 – CRA Outstanding Undergraduate Researcher Award (Honorable Mention)

2021 – University of Michigan Angell B. Scholar

2020 – Tanner's Memorial Award (\$1,500)

2020 – Sprayregan Scholarship (\$1,500)

2020 – University of Michigan OptiMize Fellowship (\$9,000)

RESEARCH EXPERIENCE

Research Affiliate Sept 2022 – Present
Massachusetts Institute of Technology Cambridge, MA

- Developed multi-agent goal inference and assistance algorithms for effective Human-AI Interaction and Collaboration
- Developing Bayesian inference algorithm for joint goal and belief inference based on agent action observations
- Presented research papers at 2023 ICML Workshop and AAAI Fall Symposium Series

Research Assistant Jun 2021 – Dec 2021
University of Michigan Ann Arbor, MI

- Conducted independent research in three different labs for my three honors theses in Computer Science, Psychology and Cognitive Science, respectively, supervised by Prof. Emily Mower Provost, Prof. Jun Zhang, and Prof. Mari Kira

PROFESSIONAL EXPERIENCE

Machine Learning intern Jun 2020 – Aug 2020
Tencent Shenzhen, China

- Used SQL, XGBoost, Word2Vec to conduct feature engineering on users' browsing data and train advertisement recommendation models to increase Tencent Ads Click-Through Rate (CTR)

Protection Intern Jan 2019 – July 2019
UNHCR, the UN Refugee Agency Beijing, China

- Facilitated the registration procedures and provided counseling services for over 200 applicants seeking asylum from Syria, Yemen, etc.
- Proposed an automated asylum registration system. Secured \$5000 funding and used Python to develop the UI Interface

Founder March 2017 – May 2020
Tide Initiative San Francisco, CA

- Founded Tide Initiative, a California 501(c)(3) nonprofit to promote social emotional learning in the U.S, Korea, and China. Partnered with schools and nonprofits to influence over 5 thousand students through workshops