Zheyuan "Brian" Zhang

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Research Interests

My research interests center on embodied AI, multimodality, and natural language processing, with the goal of creating scalable cognitive agents that perceive, act, and learn continuously and sample-efficiently from experiences, similar to humans in both physical and virtual worlds.

Areas: Embodied AI, Natural Language Processing, Computer Vision, Deep Learning, Machine Learning, Developmental Psychology, Cognitive Science

Education

Johns Hopkins University, Baltimore, MD, US — 08/2025 - 05/2030 (expected)
Ph.D. in Computer Science — Advisor: Tianmin Shu, Daniel Khashabi

University of Michigan, Ann Arbor, MI, US — 08/2022 - 04/2024
M.S. in Robotics and Graduate Certificate in Cognitive Science — Advisor: Joyce Chai
GPA: 4.000/4.000
Relevant Courses: Mathematics for Robotics, Robotic Systems Laboratory, Natural Language Processing, Computational Modeling of Cognition, Cross-Disciplinary Perspectives in Cognitive Science, Advanced Topics in Computer Vision, Mobile Manipulation Systems, Advanced Artificial Intelligence

University of Massachusetts Amherst, Amherst, MA, US — 09/2018 - 05/2022
B.S. in Computer Science
GPA: 3.848/4.000
Relevant Courses: Introduction to Computer Vision, Artificial Intelligence, Introduction to Robotics: Perception, Mechanics, Dynamics, and Control, Game Programming, Machine Learning, Practice and Applications of Data Management, Introduction to Computer Graphics, Probabilistic Graphical Models

Publications

* → equal contribution

[**P.1**] Hongxin Zhang*, **Zheyuan Zhang***, Zeyuan Wang*, Zunzhe Zhang, Lixing Fang, Qinhong Zhou, Chuang Gan. "Ella: Embodied Social Agents with Lifelong Memory". In *Submission*. 2025.

[**P.2**] Qinhong Zhou*, Hongxin Zhang*, Xiangye Lin*, **Zheyuan Zhang***, Yutian Chen, Wenjun Liu, Zunzhe Zhang, Sunli Chen, Lixing Fang, Qiushi Lyu, Xinyu Sun, Jincheng Yang, Zeyuan Wang, Bao Chi Dang, Zhehuan Chen, Daksha Ladia, Jiageng Liu, Chuang Gan. "Virtual Community: An Open World for Humans, Robots, and Society". In *The Thirteenth International Conference on Learning Representations (ICLR)*. 2026.

[**C.1**] **Zheyuan Zhang***, Fengyuan Hu*, Jayjun Lee*, Freda Shi, Parisa Kordjamshidi, Joyce Chai, Ziqiao Ma. "Do Vision-Language Models Represent Space and How? Evaluating Spatial Frame of Reference Under Ambiguities". In *The Thirteenth International Conference on Learning Representations (ICLR)*, Oral Presentation (1.8%). 2025.

[**C.2**] Yuncong Yang*, Jiageng Liu*, **Zheyuan Zhang**, Siyuan Zhou, Reuben Tan, Jianwei Yang, Yilun Du, Chuang Gan. "MindJourney: Test-Time Scaling with World Models for Spatial Reasoning". In *Advances in Neural Information Processing Systems 39 (NeurIPS)*. 2025.

[**C.3**] Shane Storks, Itamar Bar-Yossef, Yayuan Li, **Zheyuan Zhang**, Jason J. Corso, Joyce Chai. "Transparent and Coherent Procedural Mistake Detection". In *Proceedings of the 2025 Conference on Empirical Methods in Natural Language Processing (EMNLP), Long Papers*. 2025.

[**C.4**] Hongxin Zhang*, Zeyuan Wang*, Qiushi Lyu*, **Zheyuan Zhang**, Sunli Chen, Tianmin Shu, Yilun Du, Behzad Dariush, Kwonjoon Lee, Chuang Gan. "Compositional World Models for Embodied Multi-Agent Cooperation". In *The Thirteenth International Conference on Learning Representations (ICLR)*. 2025.

[**C.5**] **Zheyuan Zhang**. "A Combinatorial Approach to Neural Emergent Communication". In *Proceedings of the 31th International Conference on Computational Linguistics (COLING)*. 2025.

[**C.6**] Keunwoo Peter Yu, **Zheyuan Zhang**, Fengyuan Hu, Shane Storks, Joyce Chai. "Eliciting In-Context Learning in Vision-Language Models for Videos Through Curated Data Distributional Properties". In *Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP), Long Papers*. 2024.

[**C.7**] **Zheyuan Zhang***, Shane Storks*, Fengyuan Hu, Sungryull Sohn, Moontae Lee, Honglak Lee, Joyce Chai. "From Heuristic to Analytic: Cognitively Motivated Strategies for Coherent Physical Commonsense Reasoning". In *Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP), Long Papers*. 2023.

[**C.8**] **Zheyuan Zhang**, Huiliang Shang. "Low-cost Solution for Vision-based Robotic Grasping". In *Proceedings of the 2021 International Conference on Networking Systems of AI (INSAI), Second Prize Excellent Paper Award*. 2021.

Research Experience

MIT-IBM Watson AI Lab, Visiting Researcher — Cambridge, MA, US
UMass Amherst CICS, Research Internship — 06/2024 - 05/2025
Adviser: Chuang Gan

University of Michigan SLED Research Lab, Research Assistant — Ann Arbor, MI, US
Adviser: Joyce Chai — 11/2022 - 05/2024

Fudan University RAS Lab, Research Internship — Shanghai, CN
Adviser: Huiliang Shang, Ruijiao Li — 06/2021 - 08/2021

Honors and Awards

Oral Presentation (1.8%). ICLR 2025 Conference. — 2025

Chancellor's Award, $40,000 USD (total). UMass Amherst. — 2018-2022

Dean's List Honors (all semesters). UMass Amherst. — 2018-2022

Second Prize Excellent Paper Award. INSAI 2021 Conference. — 2021

Teaching

Graduate Student Instructor (GSI) Winter 2024, Fall 2023
EECS 492: Introduction to Artificial Intelligence
Topics: Search, Constraint Satisfaction Problem, Logic and Inference, Uncertainty, Bayesian Networks, Decision Trees, Linear Regression, Neural Networks and Generative AI, Nonparametric Methods, Decision Theory, Reinforcement Learning, Game Theory

Presentations

1. **Zheyuan Zhang**. "Guest Lecture: Embodied AI". In EECS 492, University of Michigan.
2. **Zheyuan Zhang**. "Guest Lecture: Foundation Models". In EECS 492, University of Michigan.

Academic Service

Conference Reviewer

- ICLR 2025, 2026
- ACL ARR 2025

Workshop Reviewer

- EACL-SRW 2026
- ACL-SRW 2025
- NeurIPS 2024 Pluralistic Alignment
- RSS 2025 Continual Robot Learning from Humans

Other Projects

1. Bot Lab: Autonomous Ground Vehicle from Low-level Control, SLAM to Planning and Exploration 2022
2. Clara in Wonderland: 3D Open-world Adventure Game (Unity, C#) 2021
3. Quanin: Automatic Stock Screener (Python, C#) 2021
4. Blockchain From Scratch (C++) 2020
5. Findurcourse.com: Node.js Web Application (HTML/CSS, JavaScript, PostgreSQL) 2020
6. ZiZoyaOS: 32-Bit Operating System From Scratch (Assembly, C) 2020

Skills

- Programming Languages: Python, C/C++, C#, JavaScript, MATLAB, Visual Basic, Pascal
- Other Computer Languages and Software: HTML/CSS, SQL, LaTeX, Blender, Unity, Unreal Engine