Zheyuan "Brian" Zhang

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Research Interests

Embodied Intelligence, Natural Language Processing, Computer Vision, Deep Learning, Cognitive Science

Education

University of Michigan Ann Arbor Ann Arbor, MI, United States
M.S. in Robotics & Graduate Certificate in Cognitive Science August 2022 - April 2024

- **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, United States
B.S. in Computer Science September 2018 - May 2022

- **GPA** 3.848/4.000
- **Computer Science Courses** Introduction to Problem Solving with Computers, Programming with Data Structures, Programming Methodology, Computer Systems Principles, Reasoning Under Uncertainty, Introduction to Computation, Introduction to Algorithms, Web Programming, Social Issues in Computing, 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

Preprints

[P1] Qinhong Zhou*, Hongxin Zhang*, Yutian Chen*, **Zheyuan Zhang***, Xiangye Lin, Jincheng Yang, Lixing Fang, Jiageng Liu, Xinyu Sun, Zeyuan Wang, Sunli Chen, Chuang Gan. "Virtual Community: A Generative Social World for Embodied AI". In *Submission*. 2024.

[P2] Shane Storks, Itamar Bar-Yossef, Yayuan Li, **Zheyuan Zhang**, Jason J. Corso, Joyce Chai. "Explainable Procedural Mistake Detection". In *Submission*. 2024.

Publications

[C1] **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)*. 2025.

[C2] 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.

[C3] **Zheyuan Zhang**. "A Combinatorial Approach to Neural Emergent Communication". In *Proceedings of the 31th International Conference on Computational Linguistics (COLING)*. 2025.

[C4] 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.

[C5] **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.

[C6] **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
  UMass Amherst CICS, Research Internship
  Advised by Prof. Chuang Gan
  Cambridge, MA, United States
  June 2024 – May 2025

- **University of Michigan SLED Research Lab**, Research Assistant
  Advised by Prof. Joyce Chai
  Ann Arbor, MI, United States
  November 2022 – May 2024

- **Fudan University RAS Lab**, Research Internship
  Advised by Prof. Huiliang Shang, Dr. Ruijiao Li
  Shanghai, China
  June 2021 – August 2021

Honors and Awards

- Chancellor's Award. UMass Amherst. $10,000 USD. 2018, 2019, 2020, 2021
- Dean's List Honors. UMass Amherst. 2018-2022 (8 semesters)
- 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
- **Responsibilities** host office hours, create homework and discussion slides, answer questions on Piazza, proctor midterm and final exams, deliver guest lectures

Presentations

- "Guest Lecture on Embodied AI". EECS 492: Introduction to Artificial Intelligence (Winter 2024), University of Michigan. Ann Arbor, MI, United States.
- "Guest Lecture on Foundation Models". EECS 492: Introduction to Artificial Intelligence (Fall 2023), University of Michigan. Ann Arbor, MI, United States.

Selected Projects

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