Yinong He

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EDUCATION

Carnegie Mellon University   Pittsburgh, Pennsylvania
M.S. in Robotics   *Aug. 2025 – May 2027*

UM-SJTU Joint Institute   Ann Arbor, Michigan / Shanghai, China
B.S.E. in Data Science and Electrical and Computer Engineering   *Sept. 2021 – May 2025*
- Completed the program with two years at the University of Michigan and two years at Shanghai Jiao Tong University.

University of Michigan   Ann Arbor, Michigan
B.S.E in Data Science   *Sept. 2023 – May 2025*

Shanghai Jiao Tong University   Shanghai, China
B.S.E. in Electrical and Computer Engineering   *Sept. 2021 – Aug. 2023*

RESEARCH INTERESTS

Embodied AI, Human-Robotics Interaction, Planning, Robotic Manipulation, Foundation Models, Real World Learning, Humanoid

WORKING PAPER AND PUBLICATION

1. Teaching Embodied Reinforcement Learning Agents: Informativeness and Diversity of Language Use
   Yinong He*, Jiajun Xi*, Jianing Yang, Yinpei Dai, Joyce Chai
   Accepted at EMNLP 2024 Main Conference (* indicates equal contribution) [Paper]

2. Implicit Contact Diffuser: Sequential Contact Reasoning with Latent Point Cloud Diffusion
   Zixuan Huang, **Yinong He***, Yating Lin*, Dmitry Berenson
   Accepted at ICRA 2025 (* indicates equal contribution) [Paper]
   Best Technical Contribution Award at Michigan AI Symposium

3. Language-Conditioned 3D Goal Generation for Deformable Object Manipulation
   Yinong He, Zixuan Huang, Dmitry Berenson
   Accepted at 3D-LLM/VLA Workshop, CVPR 2025

RESEARCH EXPERIENCE

NeoMatrix Internship   May 2025 – Present
Advisor: Cewu Lu   *Shanghai, China*
- Developed a diffusion policy for dexterous manipulation (e.g., tissue extraction).
- Implemented real-world demonstration data via teleoperation and human demonstrations.
- Discretized hand poses using a VQ-VAE to learn a latent codebook.
- Designed a 3D-aware model that predicts TCP pose and hand pose codebook indices for stable grasp synthesis.

Autonomous Robotic Manipulation Lab   May 2024 – Present
Advisor: Dmitry Berenson, Associate Professor in Robotics & EECS Department   *Ann Arbor, Michigan*
- Developed a cable routing task within the Mujoco environment, and created a scripted policy for data collection.
- Trained implicit neural descriptive field to encode the spatial and topological relationship between the rope and the hooks.
- Trained latent diffusion models to generate subgoals in the Neural Descriptor Field feature space for planning, and executed the trajectory using MPPI.
- Trained VLMs and diffusion models for interpreting human intent and generating the goal state of the rope routing the hook. The diffusion models' generation result is supervised by the NDF features.

Situated Language and Embodied Dialogue Lab Aug. 2023 – Present
Advisor: Joyce Chai, Professor in EECS Department *Ann Arbor, Michigan*
- Designed and developed an offline reinforcement learning algorithm to build embodied agents capable of functioning effectively with human-provided language feedback.
- Conducted empirical studies across four RL benchmarks, demonstrating that agents trained with diverse and informative language feedback achieved enhanced in-domain performance and effective transfer to new tasks with human language instructions.
- Investigated which task settings allow language inputs to most effectively aid agents, and analyzed agent performance under adversarial attacks or varying language frequency scenarios.

SELECTED PROJECTS

State-Feedback Control Design with Sector-Bounded Nonlinearities
Course Project for ECE598 Convex Optimization in Control. *Instructor: Peter Seiler*
- Developed state-feedback control theorems using advanced mathematical tools, including the Lyapunov Theorem, Circle Criterion, Schur Complement, and Linear Matrix Inequalities (LMI), leveraging Semi-Definite Programming (SDP) for convex optimization to ensure stability and performance under nonlinear sector-bounded dynamics.
- Optimized controllers with both H_2 performance for minimizing energy response and H_∞ performance for robust disturbance rejection.

AWARDS

Best Technical Contribution Award @ Michigan AI Symposium	Oct. 2024
Dean's Honor List	Apr. 2024
Dean's Honor List	Dec. 2023
Silver Medal in University Physics Competition	Nov. 2022
Shanghai Jiao Tong University Science and Technology Scholarship	May 2023

LANGUAGE PROFICIENCY

- TOEFL: 113 (Reading: 30, Listening: 28, Speaking: 26, Writing: 29)
- GRE: 331 (Verbal: 161, Quant: 170)

TEACHING EXPERIENCE

Grader for EECS498 Large Language Models	Aug. 2024 – Dec. 2024
Instruction Assistant for MATH186 Honors Calculus II	Aug. 2022 – Jan. 2023

SELECTED COURSEWORK

Advanced Artificial Intelligence (A), Mathematical Foundation of Robotics (A), Large Language Models (A+), Convex Optimization in Control (A+), Introduction to Robotic Manipulation (A+), Deep Learning for Robot Perception (A), Introduction to Machine Learning (A), Data Structure and Algorithms (A+), Discrete Stochastic Process (A), Combination and Graph Theory (A+), Differential Equation (A+), Numerical Analysis(A+)

EXTRA CURRICULUM

Minister of Student Science, Technology and Innovation Association Aug. 2022 – Jun. 2023
- ∗ Prepared for workshops intended for students in the department.
- ∗ Organized the Robotics Competition in the department.

Class Advisor Aug. 2022 – Present
- ∗ Assisted class students in their coursework, research, and future plans.