Huaidian Hou

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Education

University of Michigan, Ann Arbor, MI

B.S.E. Computer Science, Minor in Mathematics   *Aug 2022 – May 2026 (Expected)*

- **GPA**: 3.984/4.00 (Major GPA: 4.00/4.00)
- **Core Courses:** Robot Learning (A+), Advanced Artificial Intelligence (A), Algorithms for Robotics (A), Computer Vision (A), Reinforcement Learning (A), Natural Language Processing (A+)
- **Honors:** 7-term Angell Scholar (2024-2026); Engineering Honors Program.

Research & Experiences

AI Robotics Researcher | ARM Lab, UMich   *Jan 2025 – Present*

- Engineered a **multimodal diffusion framework** using controllable modality noise schedule for forceful manipulation, outperforming DP3 baseline by up to 60% in real world tasks.
- Second author of "Multimodal Diffusion Forcing for Forceful Manipulation", accepted to **ICRA 2026.**
- Created an **IsaacSim engine maintenance task** suite for forceful manipulation learning with custom assets and teleoperation support. Simulation used for Diffusion Policy training and symbolic planning research.
- Optimized a **teleoperation pipeline** using VR controllers and Unity3D, reducing control-to-data-logging latency by 70% over the prior system for real-time data collection.

LLM Robustness Researcher | CSE 692, UMich   *Jan 2025 – May 2025*

- Curated LLM Robustness evaluation dataset by augmenting MMLU, TruthfulQA, and CommonsenseQA.
- Proposed, evaluated novel LLM robustness metrics and analyzed model errors across 15 LLMs. Key insights used to fine-tune Pref-Aligner model, achieving SOTA robustness.
- Fourth author of "Benchmarking and Improving LLM Robustness for Personalized Generation"; accepted to **EMNLP 2025**.

Programmable Dice Project Lead | Shapiro Design Lab, UMich   *Mar 2024 – Present*

- Designed multi-screen dice prototype for interactive language learning. Presented at Serious Play 2025.
- Architected hybrid multi-screen system for synchronized text, image, and gif display using custom protocol with SPI Bus between Raspberry Pi and multiple ESP32 screen controllers.
- Designed and manufactured compact package **75% smaller** in volume than existing multi-screen projects.

Robot Dynamics Research Assistant | BIRDS Lab, UMich   *Jan 2024 – Dec 2024*

- **Designed Moteus motor controller architecture** for PyCKBot library, powering a novel version of the RHex robot (FastANT) with 7 times more powerful motors, improving dynamics under heavy load.
- Architected asynchronous command aggregation and lifecycle management for Moteus driver, achieving **60% less bus occupation** in real-life usage and reduced bus collision rate.

Driver Behavior Research Assistant | UMTRI, UMich   *May 2024 – Aug 2024*

- Identified parametric driver modeling limitations under congestion through time-series clustering.
- Created a CUDA accelerated framework for parametric car-following model evaluation and optimization, which accelerated parametric model evaluation by **30 times** on consumer-grade GPU.
- **First author** of Evaluating Parametric Car-Following Models in Naturalistic Congestion: Insights in Driver Behavior and Model Limitations; accepted to **TRBAM 2025.**

Skills

- **Programming Languages**: Python, C++, MATLAB
- **Frameworks & Tools**: NVIDIA IsaacSim & IsaacLab, PyTorch, ROS2, Arduino, ESP32, CUDA.
- **Design & Fabrication**: Fusion 360, SolidWorks, 3D Printing, Laser Cutting
- **Languages:** English (proficient), Mandarin (native)