Xiaoji Zheng

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Education

Southeast University, BS in Computer Science — Sept. 2020 – June 2024

- **GPA:** 3.87/4.0 (rank: 5/113) **Honor:** National Scholarship, President's Scholarship

Tsinghua University, MS in Autonomous Driving — Sept. 2024 – June 2027

- **GPA:** 4.0/4.0 (rank: 1/56) **Honor:** National Scholarship

Experience

Research Assistant, Institute for AI Industry Research (AIR), Tsinghua University — Aug. 2023 – Present

- Building a world-model-driven IL+RL framework (**CoIRL-AD**) for end-to-end autonomous driving, achieving **68% collision-rate reduction** under cross-city generalization compared with strong baselines.
- Building an LLM-enhanced motion prediction framework (**LLM-Augmented-MTR**), rank 21/40 at Waymo Challenge 2024
- Developed $\boldsymbol{E^3AD}$, integrating human cognitive signals (EEG) into end-to-end autonomous driving, achieving **26% collision-rate reduction** compared with UniAD

Software Engineer Intern, Architecture and Design Department, HUAWEI — Sept. 2023 – Mar. 2024

- Designed and implemented **Flow RSS++** for flow-level packet load balancing framework for $\geq$ **100Gbps data center networks**
- validated via C++ simulator, reducing packet loss from **50% to 10%** under extreme congestion

Research Intern, Multi-modal Intelligence Department, World Model Group, XPENG Robotics Center — Jan. 2026 – Present

- Investigating the closed-loop interaction between Vision-Language-Action (VLA) models and world models via reinforcement learning
- Studying the effectiveness of sim-to-real transferred data generated by world models for improving VLA performance

Publications

[1] **CoIRL-AD: Collaborative-Competitive Imitation-Reinforcement Learning in Latent World Models for Autonomous Driving** (ICML 2026) [website] [arxiv] [github]

Xiaoji Zheng*, Ziyuan Yang*, Yanhao Chen, Yuhang Peng, Yuanrong Tang, Gengyuan Liu, Bokui Chen, Jiangtao Gong

- Designed and implemented a world-model-driven IL+RL framework, enabling closed-loop rollout without external simulators
- Introduced a competitive–collaborative mechanism between IL and RL actors, achieving 68% collision-rate reduction under cross-city generalization (0.69% $\rightarrow$ 0.22%)

[2] **Embodied Cognition Augmented End2End Autonomous Driving** (NeurIPS 2025) [arxiv] [neurips]

Ling Niu, Xiaoji Zheng, Han Wang, Ziyuan Yang, Chen Zheng, Bokui Chen, Jiangtao Gong

- Aligned cognitive (EEG) and visual perception representations via contrastive learning on a self-collected ⟨EEG, video⟩ dataset.
- Improved end-to-end autonomous driving by integrating cognition-aligned perception features

[3] **FreeAskWorld: An Interactive and Closed-Loop Simulator for Human-Centric Embodied AI** (AAAI 2025, **Oral**) [arxiv] [github] [dataset]

Yuhang Peng, Yizhou Pan, Xinning He, Jihaoyu Yang, Xinyu Yin, Han Wang, Xiaoji Zheng, Chao Gao, Jiangtao Gong

- Co-developed FreeAskWorld, an interactive closed-loop simulator and benchmark for human-centric embodied navigation

- Enabled agents to interact with humans for goal-directed assistance in urban VLN tasks

[4] **Large Language Models Powered Context-aware Motion Prediction in Autonomous Driving** (IROS 2024) [website] [arxiv] [github]

Xiaoji Zheng, Lixiu Wu, Zhijie Yan, Hao Zhao, Chen Zhong and Jiangtao Gong

- Enabled LLMs to interpret BEV-style traffic scenes and generate high-level semantics (intentions, affordances, drivable areas), improving motion prediction performance

[5] **An EEG Dataset for Understanding Driving Expertise from Naturalistic Urban Road Experiments** (Nature Scientific Data) [nature_link]

Jiangtao Gong, Yueteng Yu, Yancheng Cao, Ruoxuan Yang, Xiang Chang, Haoming Tang, Xiaoji Zheng, Yiyao Liu, Shanhe You, Chen Zheng, Guyue Zhou

- Collected a large-scale multimodal dataset of human driving behavior, including EEG, electrodermal activity (EDA), and heart rate signals
- Led preprocessing and analysis of EEG data, including signal cleaning, feature extraction, and quality validation

[6] **Extended VR: Exploring the Integration of VR Experiences and Real-world Engagement** (DIS 2023) [video] [paper]

Xiaoji Zheng, Shaojun Sun, Ying Cao, Jiatong Li, Ding Ding, Zhuying Li

- Collected user behavior data to bridge virtual experiences with the physical world
- Proposed the "Extended VR" design paradigm, which encourages users to re-engage with the real world through virtual experiences

Skills

Programming: Python, C++, basic experience with Java, JavaScript, SQL

Topics: World Models, Reinforcement Learning, End-to-End Autonomous Driving, Embodied AI