JIAWEI REN

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EDUCATION

Master of Science | *Computer Science* — Sep. 2024 – Present
University of California, San Diego — San Diego, CA

Bachelor of Engineering | *Software Engineering* — Sep. 2020 – Jul. 2024
Tsinghua University — Beijing, China

PUBLICATIONS

(* equal contribution)

- Yan Zhuang*, **Jiawei Ren***, Xiaokang Ye*, Xuhong He, Zijun Gao, Ryan Wu, Mrinaal Dogra, Cassie Zhang, Kai Kim, Bertt Wolfinger, Ziqiao Ma, Tianmin Shu, Zhiting Hu, Lianhui Qin. SimWorld: A World Simulator for Scaling Photorealistic Multi-Agent Interactions *(CVPR Demo 2025)*.
- Xiaokang Ye*, **Jiawei Ren***, Yan Zhuang, Xuhong He, Yiming Liang, Yiqing Yang, Mrinaal Dogra, Xianrui Zhong, Eric Liu, Kevin Benavente, Rajiv Mandya Nagaraju, Dhruv Vivek Sharma, Ziqiao Ma, Tianmin Shu, Zhiting Hu, Lianhui Qin. SimWorld-Agent: An Open-ended Simulator for Agents in Physical and Social Worlds *(NeurIPS Main 2025 Spotlight)*.
- Yan Zhuang, **Jiawei Ren**, Xiaokang Ye, Jianzhi Shen, Ruixuan Zhang, Tianai Yue, Muhammad Faayez, Xuhong He, Xiyan Zhang, Ziqiao Ma, Lianhui Qin, Zhiting Hu, Tianmin Shu. SimWorld-Robot: Synthesizing Photorealistic and Dynamic Urban Environments for Multimodal Robot Navigation and Collaboration *(NeurIPS Main 2025)*.
- Gengyuan Shi, Chaokun Wang, Yabin Liu, **Jiawei Ren**. Adaptive and Robust Translation from Natural Language to Multi-model Query Languages *(ACL Main 2025)*.

EXPERIENCE

Research Assistant — Sep. 2024 – Present
Project Leader — UC San Diego

- Developed **SimWorld**, a next-generation simulator built on Unreal Engine 5 for training and evaluating embodied and agentic AI systems. SimWorld provides high-fidelity world simulation with realistic physical and social dynamics, supports language-conditioned procedural generation, and offers a multimodal interface that connects perception, reasoning, and action for LLM/VLM agents.
- Designed and implemented the **SimWorld Agent Task** for large-scale evaluation of multimodal reasoning, including (1) **social reasoning tasks** where multiple agents collaborate or compete in delivery and negotiation scenarios, and (2) **physical reasoning tasks** where agents navigate dynamic urban environments using visual perception under realistic traffic dynamics.
- Developed scalable pipelines for simulation, evaluation, and model deployment, supporting systematic analysis of agent behaviors and interoperability across different frameworks and workflows.

Research Assistant — Sep. 2023 – Jul. 2024
Core Member — Tsinghua University

- Conducted research on **Multi-Model Query Optimization and AI4DB**, proposing a method to accelerate cross-engine query execution by directly accessing low-level storage layers, reducing query translation overhead.
- Formulated the **Text-to-Multi-Model Query Language (Text-to-MMQL)** task to enable natural language interaction with heterogeneous databases (AQL, ECQL, SQL++). Constructed the first benchmark dataset covering multiple query dialects for systematic evaluation.
- Fine-tuned a T5 model for multi-dialect query generation, achieving strong generalization across diverse schemas and establishing a foundation for unified semantic understanding across query languages.

Data Engineer Intern — Jun. 2023 – Sep. 2023
Intern — Data and Intelligence Development Group, JD Retail

- Developed a **high-throughput data tracking and management platform** using Spring Boot and MySQL, supporting real-time data ingestion and improving backend system scalability and reliability.
- Designed and implemented **ETL pipelines** for integrating heterogeneous data sources, performing data cleaning, transformation, and loading to support downstream analysis.

SKILLS

Programming: Python, C/C++, Java, JavaScript
Web development: Vue3, Flutter, Flask, Django, Spring Boot
Database management systems: MySQL, SQLite, PostgreSQL, Neo4J
Operating systems: Windows, Linux
Languages: English (fluent), Chinese (Native)