

Ruizhe Zhou

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EDUCATION

Sun Yat-sen University

Undergraduate of Intelligent Science and Technology (3.5 / 4.0)

Shenzhen, China

Sep. 2023 – Jun. 2027

RESEARCH INTERESTS

Reasoning | Visual Intelligence | Physical Intelligence

EXPERIENCE

Sun Yat-sen University / SYSU

Jun. 2025 – Oct. 2025

HCP Lab

Advisor: Xiaodan Liang

- Systematically surveyed tasks, datasets, models, and evaluation benchmarks in Physical AI.
- Proposed a unified development roadmap spanning perception and reasoning to world modeling and embodied interaction.
- Completed a comprehensive survey on Physical AI and built an open-sourced GitHub repository curating related resource.

University of California San Diego / UCSD

Nov. 2025 – Feb. 2026

PXie Lab

Advisor: Pengtao Xie

- Constructed the SCOPE-60K and SCOPE-250 (Fingerprinting) datasets.
- Proposed SCOPE, a scalable and controllable model routing framework that predicts model performance and cost through pre-hoc reasoning.
- Enabled dynamic accuracy–efficiency trade-offs by explicitly modeling routing outcomes instead of selecting fixed model identities.

Mohamed bin Zayed University of Artificial Intelligence / MBZUAI

Feb. 2026 – Jun. 2026

Cooperate with Transsion

Advisor: Xiaodan Liang

- Developed a complete data processing pipeline, including data filtering and annotation.
- Introduced Semantic Channel Transfer and Visualized Task Semantics (VTS), a benchmark framework for evaluating whether multimodal reasoning behaviors transfer when task instructions move from text tokens to image pixels.
- Identified a novel look–read–bind failure mode, showing that multimodal reasoning failures arise from weak instruction binding rather than OCR limitations alone.
- Proposed Prompt-Region Grounding, a post-training framework that aligns rendered prompt regions with textual semantics, reducing the semantic channel gap while preserving original reasoning performance.

University of North Carolina at Chapel Hill / UNC-Chapel Hill

May. 2026 – Present

CV Lab

Advisor: Xiaoming Liu

- Explored spatial reasoning in multimodal LLMs for robust geometric and visual-spatial understanding.

PUBLICATIONS

[1] **Aligning Perception, Reasoning, Modeling and Interaction: A Survey on Physical AI** *TPAMI*

Kun Xiang*, Terry Jingchen Zhang*, Yinya Huang*, Jixi He, Zirong Liu, Yueling Tang, **Ruizhe Zhou**, Lijing Luo, Youpeng Wen, Xiuwei Chen, Bingqian Lin, Jianhua Han, Hang Xu, Hanhui Li, Bin Dong, Xiaodan Liang

[2] **Models Under SCOPE: Scalable and Controllable Routing via Pre-hoc Reasoning** *ICML 2026*

Qi Cao*, Shuhao Zhang*, **Ruizhe Zhou**, Ruiyi Zhang, Peijia Qin, Pengtao Xie

[3] **When Prompts Become Pixels: Semantic Channel Transfer in Multimodal Reasoning** *Under Review*

Yongxin Wang*, **Ruizhe Zhou***, Yueling Tang, Yingying Zhu, Xuemin Zhao, Xiaojun Chang, Xiaodan Liang

REWARDS

First Prize in the National College Students Mathematics Competition

2025

Sun Yat-sen University Outstanding Student Scholarship

2024

Sun Yat-sen University Inspirational Scholarship

2024

Second Prize in the 39th National Physics Competition for Middle School Students

2023