RUOHAO LI

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EDUCATION

Ph.D. Student, Computational Media 2024 – 2028 (expected)
The Hong Kong University of Science and Technology
Research Interests: Vision-Language Models, Multi-Agent Systems, 3D Reconstruction, XR/VR, Human-Centered AI

M.S., Smart Cities (Transferred to PhD), GPA: 3.7/4.0 2023 – 2024
University of Pennsylvania

B.S., GPA: 3.6/4.0 2019 – 2023
Zhejiang University

PUBLICATIONS

- *RemVerse: Supporting Reminiscence Activities for Older Adults through AI-Assisted Virtual Reality.*
  ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp' 2025) ***Oral***
  Published on *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*
  Ruohao Li, Jiawei Li, Jia Sun, Zhiqing Wu, Zisu Li, Ziyan Wang, Ge Lin Kan, Mingming Fan.
  https://doi.org/10.1145/3749505

- *Habitat protection in urban–rural fringes through coordinated ecological network construction and territorial planning*
  Land, 2024
  Yuting Xie, Jiaxin Ying, Jie Zou, Ruohao Li, Haoxun Zhang, Qie Shi, Yonghua Li.
  https://doi.org/10.3390/land13070935

RESEARCH EXPERIENCE

SwarmSys: Decentralized Multi-Agent Reasoning System 2024 – Present
HKUST

· Designed a swarm-intelligence-inspired framework for distributed reasoning, task decomposition, and consensus building.
· Implemented role-based agents (explorer, worker, validator, regulator) and agent-event matching via embedding-based decision-making.
· Conducted experiments on math exams, research problems, and multi-domain tasks; evaluated scalability, robustness, and efficiency.

Reality-Preserving Digital Twins for Collaboration 2024 – Present
HKUST

· Developed graph-based digital twin representations bridging perceptual realism and interactive affordances.
· Explored integration of distributed multi-agent systems with GPU-accelerated 3D reconstruction pipelines.
· Applications in education, collaborative problem-solving, and healthcare XR.

RemVerse: AI-Assisted VR 2024
HKUST

· Built immersive VR environments reconstructed from historical photos and videos using large-scale 3D Gaussian Splatting and Unreal Engine.
· Integrated conversational agents powered by VLMs to guide reminiscence, evoke long-term memories, and enhance emotional engagement.
· Conducted user studies with older adults, evaluating memory recall, communication patterns, and emotional responses.

Hurricane Damage Area Prediction with YOLO Mar 2024 – May 2024
University of Pennsylvania

- Split large satellite images into 10,000 patches and annotated 1000 images in OpenCV.
- Conducted data wrangling, created SQL tables for cloud storage, and managed cloud pipeline.
- Fine-tuned YOLOv9 model with image & JSON-text data; deployed results in cloud buckets.

SKILLS

Programming	Python (PyTorch, TensorFlow, NumPy, Pandas), SQL, R, Java, HTML/CSS/JS
AI/ML & Agents	LLM fine-tuning, multi-agent systems, vision–language models, 3D Gaussian Splatting
Frameworks & Tools	Linux, Git, Unity, Unreal Engine 5, LaTeX, OpenCV, ArcGIS, PostGIS
Domains	Distributed systems, XR/VR, digital twins, human–computer interaction, cloud computing