

Xiuwei Xu

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Education

Department of Automation, Tsinghua University

PhD in Control Science and Engineering

Advisor: Prof. Jiwen Lu

Beijing, China

2021-

Department of Automation, Tsinghua University

B.S. in Automation

Beijing, China

2017-2021

Experience

GigaAI

Intern in World Model Group

Engineer topic: world model as simulator, 3D-aware action control, manipulation data generation.

Beijing, China

2026

BOSCH China

Intern in Autonomous Driving Department

Engineer topic: multi-task scene understanding, semi-supervised object detection.

Shanghai, China

2023

Cambricon

Intern in Intelligent Processor Research Center

Engineer topic: CNN acceleration and deployment on microserver with C-based language.

Beijing, China

2020

Research Interests

My research interest lies in robotics, with a focus on scalable general-purpose manipulation models. My earlier work was rooted in 3D vision, where I studied 3D scene understanding and its applications to embodied navigation and manipulation. I now focus on building general embodied agents that can perceive, reason, and act in complex environments, with manipulation as the core capability. My 3D vision background further supports my research in embodied data processing, spatial representation learning, and model design.

Publications

* Equal contribution, † Project leader.

First-Authored Top Conference/Journal

- [1] **Xiuwei Xu***, Angyuan Ma*, Hankun Li, Bingyao Yu, Zheng Zhu, Jie Zhou, Jiwen Lu
R2RGen: Real-to-Real 3D Data Generation for Spatially Generalized Manipulation
Robotics: Science and Systems (RSS), 2026
- [2] Wenxuan Guo*, **Xiuwei Xu***, Hang Yin, Ziwei Wang, Jianjiang Feng, Jie Zhou, Jiwen Lu
Incremental 3D Gaussian Localization for Image-goal Navigation
IEEE International Conference on Computer Vision (ICCV), 2025
- [3] Hang Yin*, **Xiuwei Xu*†**, Linqing Zhao, Ziwei Wang, Jie Zhou, Jiwen Lu
UniGoal: Towards Universal Zero-shot Goal-oriented Navigation
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2025
- [4] Wenxuan Guo*, **Xiuwei Xu***, Ziwei Wang, Jianjiang Feng, Jie Zhou, Jiwen Lu
Text-guided Sparse Voxel Pruning for Efficient 3D Visual Grounding
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR, **Highlight**), 2025
- [5] **Xiuwei Xu**, Huangxing Chen, Linqing Zhao, Ziwei Wang, Jie Zhou and Jiwen Lu

EmbodiedSAM: Online Segment Any 3D Thing in Real Time

The Thirteenth International Conference on Learning Representations (ICLR, **Oral**), 2025

- [6] Hang Yin*, **Xiuwei Xu**^{*†}, Zhenyu Wu, Jie Zhou, Jiwen Lu
SG-Nav: Online 3D Scene Graph Prompting for LLM-based Zero-shot Object Navigation
Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2024
- [7] **Xiuwei Xu***, Zhihao Sun*, Ziwei Wang, Hongmin Liu, Jie Zhou, Jiwen Lu
3D Small Object Detection with Dynamic Spatial Pruning
European Conference on Computer Vision (ECCV), 2024
- [8] **Xiuwei Xu**, Ziwei Wang, Jie Zhou, Jiwen Lu
Back to Reality: Learning Data-Efficient 3D Object Detector with Shape Guidance
IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), 2024
- [9] **Xiuwei Xu***, Chong Xia*, Ziwei Wang, Linqing Zhao, Yueqi Duan, Jie Zhou, Jiwen Lu
Memory-based Adapters for Online 3D Scene Perception
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024
- [10] **Xiuwei Xu**, Ziwei Wang, Jie Zhou, Jiwen Lu
Binarizing Sparse Convolutional Networks for Efficient Point Cloud Analysis
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023
- [11] **Xiuwei Xu**, Yifan Wang, Yu Zheng, Yongming Rao, Jie Zhou, Jiwen Lu
Back to Reality: Weakly-supervised 3D Object Detection with Shape-guided Label Enhancement
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022

Peer-Reviewed Conference Publications

- [12] Hang Yin*, Haoyu Wei*, **Xiuwei Xu**[†], Wenxuan Guo, Jie Zhou, Jiwen Lu
GC-VLN: Instruction as Graph Constraints for Training-free Vision-and-Language Navigation
Ninth Annual Conference on Robot Learning (CoRL), 2025
- [13] Zhenyu Wu*, Angyuan Ma*, **Xiuwei Xu**[†], Hang Yin, Yinan Liang, Ziwei Wang, Jiwen Lu, Haibin Yan
MoTo: A Zero-shot Plug-in Interaction-aware Navigation for General Mobile Manipulation
Ninth Annual Conference on Robot Learning (CoRL), 2025
- [14] Zhenyu Wu, Yuheng Zhou, **Xiuwei Xu**, Ziwei Wang, Haibin Yan
MoManipVLA: Transferring Vision-language-action Models for General Mobile Manipulation
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2025
- [15] Yinan Liang, Ziwei Wang, **Xiuwei Xu**, Jie Zhou, Jiwen Lu
EfficientLLaVA: Generalizable Auto-Pruning for Large Vision-language Models
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2025
- [16] Changyuan Wang, Ziwei Wang, **Xiuwei Xu**, Yansong Tang, Jie Zhou and Jiwen Lu
Q-VLM: Post-training Quantization for Large Vision-Language Models
Thirty-eighth Conference on Neural Information Processing Systems (NeurIPS), 2024
- [17] Changyuan Wang, Ziwei Wang, **Xiuwei Xu**, Yansong Tang, Jie Zhou and Jiwen Lu
Towards Accurate Post-training Quantization for Diffusion Models
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR, **Highlight**), 2024
- [18] Linqing Zhao, **Xiuwei Xu**, Ziwei Wang, Yunpeng Zhang, Borui Zhang, Wenzhao Zheng, Dalong Du, Jie Zhou and Jiwen Lu
LowRankOcc: Tensor Decomposition and Low-Rank Recovery for Vision-based 3D Semantic Occupancy Prediction
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024
- [19] Yinan Liang, Ziwei Wang, **Xiuwei Xu**, Yansong Tang, Jie Zhou and Jiwen Lu
MCUFormer: Deploying Vision Transformers on Microcontrollers with Limited Memory
Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023

Peer-Reviewed Journal Publications

- [20] Ziwei Wang, Changyuan Wang, **Xiuwei Xu**, Jie Zhou and Jiwen Lu
Quantformer: Learning Extremely Low-precision Vision Transformers
IEEE Transactions on Pattern Analysis and Machine Intelligence (**T-PAMI**), 2023
- [21] Yu Zheng, **Xiuwei Xu**, Jie Zhou and Jiwen Lu
PointRas: Uncertainty-Aware Multi-Resolution Learning for Point Cloud Segmentation
IEEE Transactions on Image Processing (**T-IP**), 2022

Honors and Awards

- First Place in CVPR 2026 **World Model as Evaluator** Challenge 2026
- NSFC Youth Student Research Grant (PhD) 2024
- Chinese National Scholarship 2024
- Outstanding Graduate of Beijing 2021
- Innovation Award of Science and Technology, Tsinghua University 2020
- Innovation Award of Science and Technology, Tsinghua University 2019

Teaching Experience

Department of Automation, Tsinghua University Teaching assistant for Computer Vision	Beijing, China 2024-2025
Department of Automation, Tsinghua University Teaching assistant for Pattern Recognition and Machine Learning	Beijing, China 2022-2023
Department of Automation, Tsinghua University Teaching assistant for Numerical Analysis	Beijing, China 2021

Academic Services

Conference Reviewer

- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2025-2026)
- Neural Information Processing Systems (NeurIPS 2024-2025)
- IEEE/CVF International Conference on Computer Vision (ICCV 2023, 2025)
- European Conference on Computer Vision (ECCV 2024, 2026)
- International Conference on Machine Learning (ICML 2025-2026)
- International Conference on Representation Learning (ICLR 2025-2026)
- Conference on Robot Learning (CoRL 2025-2026)

Journal Reviewer

- International Journal of Computer Vision (IJCV)
- IEEE Transactions on Image Processing (T-IP)
- IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT)
- IEEE Transactions on Multimedia (T-MM)
- IEEE Transactions on Intelligent Transportation Systems (T-ITS)