Xiuwei Xu

xxw21@mails.tsinghua.edu.cn • xuxw98.github.io

Education

Department of Automation, Tsinghua University — Beijing, China
PhD in Control Science and Engineering — *2021-*
Advisor: Prof. Jiwen Lu

Department of Automation, Tsinghua University — Beijing, China
B.S. in Automation — *2017-2021*

Experience

BOSCH China — Shanghai, China
Intern in Autonomous Driving Department — *2023*
Engineer topic: multi-task scene understanding, semi-supervised object detection.

Cambricon — Beijing, China
Intern in Intelligent Processor Research Center — *2020*
Engineer topic: CNN acceleration and deployment on microserver with C-based language.

Research Interests

My research interest is 3D vision and robotics. In particular, I am interested in 3D scene understanding and its application in embodied tasks like navigation and manipulation. I believe embodied intelligence will reshape the society and benefit our lives. My long-term goal is to construct general embodied agents with the ability to perceive, plan and act in 3D space.

Publications

* Equal contribution, † Project leader.

First-Authored Top Conference/Journal

[1] 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

[2] 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

[3] 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

[4] **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

[5] 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

[6] **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

[7] **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

[8] **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

[9] **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

[10] **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

[11] 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

[12] 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

[13] 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

[14] 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

[15] 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

[16] 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

[17] 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

[18] 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

[19] 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

[20] 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

- 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 Beijing, China
Teaching assistant for Computer Vision *2024-2025*

Department of Automation, Tsinghua University Beijing, China
Teaching assistant for Pattern Recognition and Machine Learning *2022-2023*

Department of Automation, Tsinghua University Beijing, China
Teaching assistant for Numerical Analysis *2021*

Academic Services

Conference Reviewer

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

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)