Ziwei Wang

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Working Experience

School of Electrical and Electronic Engineering, Nanyang Technological University
Assistant Professor   *2024-*

Robotics Institute, Carnegie Mellon University
Postdoc Fellow with Prof. Changliu Liu   *2023-2024*

Computer Science and Artificial Intelligence Laboratory, MIT
Research assistant with Prof. Edward Adelson   *2017*

Education

Department of Automation, Tsinghua University   Beijing, China
    PhD in Control Science and Engineering   *2018-2023*
    Advisor: Prof. Jiwen Lu

Department of Physics, Tsinghua University   Beijing, China
    B.S. in Maths and Physics   *2014-2018*

Research Interests

Embodied AI and Robotics

Publications

Peer-Reviewed Conference Publications

[1] Wenkai Guo, Guanxing Lu, Haoyuan Deng, Zhenyu Wu, Yansong Tang, **Ziwei Wang**
Vla-reasoner: Empowering vision-language-action models with reasoning via online monte carlo tree search
IEEE International Conference on Robotics and Automation (**ICRA**), 2026

[2] Runhao Li, Wenkai Guo, Zhenyu Wu, Changyuan Wang, Haoyuan Deng, Zhenyu Weng, Yap-Peng Tan, **Ziwei Wang**
MAP-VLA: Memory-Augmented Prompting for Vision-Language-Action Model in Robotic Manipulation
IEEE International Conference on Robotics and Automation (**ICRA**), 2026

[3] Haoyuan Deng, Wenkai Guo, Qianzhun Wang, Zhenyu Wu, **Ziwei Wang**
SafeBimanual: Diffusion-based trajectory optimization for safe bimanual manipulation
9th Annual Conference on Robot Learning (**CoRL**), 2025

[4] 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
9th Annual Conference on Robot Learning (**CoRL**), 2025

[5] Zongzheng Zhang, Chenghao Yue, Haobo Xu, Minwen Liao, Xianglin Qi, Huan-ang Gao, **Ziwei Wang**, Hao Zhao
RoboChemist: Long-Horizon and Safety-Compliant Robotic Chemical Experimentation
9th Annual Conference on Robot Learning (**CoRL**), 2025

[6] Zongzheng Zhang, Haobo Xu, Zhuo Yang, Chenghao Yue, Zehao Lin, Huan-ang Gao, **Ziwei Wang**, Hao Zhao
Elucidating the Design Space of Torque-aware Vision-Language-Action Models
9th Annual Conference on Robot Learning (**CoRL**), 2025

[7] Guanxing Lu*, Tengbo Yu*, Haoyuan Deng, Season Si Chen, Yansong Tang, **Ziwei Wang**
AnyBimanual: Transferring Unimanual Policy for General Bimanual Manipulation
IEEE International Conference on Computer Vision (**ICCV**), 2025

[8] Guanxing Lu*, Boxiong Jia*, Puhao Li*, Yixin Chen, **Ziwei Wang**, Yansong Tang, Siyuan Huang
GWM: Towards Scalable Gaussian World Models for Robotic Manipulation
IEEE International Conference on Computer Vision (**ICCV**), 2025

[9] 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

[10] Tengbo Yu*, Guanxing Lu*, Zaijia Yang*, Haoyuan Deng, Si Chen, Jiwen Lu, Wenbo Ding, Guoqiang Hu, Yansong Tang, **Ziwei Wang**
ManiGaussian++: General Robotic Bimanual Manipulation with Hierarchical Gaussian World Model
IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), 2025

[11] Zhenyu Wu, Xiuwei Xu, **Ziwei Wang**, Chong Xia, Linqing Zhao, Jiwen Lu, Haibin Yan
Anyview: Generalizable Indoor 3D Object Detection with Variable Frames
IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), 2025

[12] Zhenyu Wu, **Ziwei Wang**, Xiuwei Xu, Jiwen Lu, Haibin Yan
Embodied Instruction Following in Unknown Environments
IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), 2025

[13] Zhenyu Wu, Yuheng Zhou, Xiuwei Xu, **Ziwei Wang** and 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 and Jiwen Lu
EfficientLLaVA:Generalizable Auto-Pruning for Large Vision-language Models
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2025

[15] Wenxuan Guo, Xiuwei Xu, **Ziwei Wang**, Jianjiang Feng, Jie Zhou and Jiwen Lu
Text-guided Sparse Voxel Pruning for Efficient 3D Visual Grounding
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR, Highlight**), 2025

[16] Hang Yin*, Xiuwei Xu*, Linqing Zhao, **Ziwei Wang**, Jie Zhou and Jiwen Lu
UniGoal: Towards Universal Zero-shot Goal-oriented Navigation
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2025

[17] Guanxing Lu, **Ziwei Wang**, Changliu Liu, Jiwen Lu and Yansong Tang
ThinkBot: Embodied Instruction Following with Thought Chain Reasoning
The Thirteenth International Conference on Learning Representations (**ICLR**), 2025

[18] 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

[19] 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

[20] Guanxing Lu, Shiyi Zhang, **Ziwei Wang**, Changliu Liu, Jiwen Lu and Yansong Tang
ManiGaussian: Dynamic Gaussian Splatting for Multi-task Robotic Manipulation
European Conference on Computer Vision (**ECCV**), 2024

[21] Xiuwei Xu*, Zhihao Sun*, **Ziwei Wang**, Hongming Liu, Jie Zhou and Jiwen Lu
3D Small Object Detection with Dynamic Spatial Pruning
European Conference on Computer Vision (**ECCV**), 2024

[22] 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

[23] Xiuwei Xu, Chong Xia, **Ziwei Wang**, Linqing Zhao, Yueqi Duan, Jie Zhou and Jiwen Lu
Memory-based Adapters for Online 3D Scene Perception
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2024

[24] 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

[25] 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

[26] Xiuwei Xu, **Ziwei Wang**, Jie Zhou and Jiwen Lu
Binarizing Sparse Convolutional Networks for Efficient Point Cloud Analysis
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2023

[27] Zhenyu Wu, **Ziwei Wang**, Jiwen Lu and Haibin Yan
Category-level Shape Estimation for Densely Cluttered Objects
IEEE International Conference on Robotics and Automation (**ICRA**), 2023

[28] Quan Zheng, **Ziwei Wang**, Jie Zhou and Jiwen Lu
Shap-CAM: Visual Explanations for Convolutional Neural Networks based on Shapley Value
17_{th} European Conference on Computer Vision (**ECCV**), 2022

[29] Zhenyu Wu*, **Ziwei Wang***, Zibu Wei, Yi Wei and Haibin Yan
Smart Explorer: Recognizing Objects in Dense Clutter via Interactive Exploration
IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), 2022

[30] Zhan Liu, **Ziwei Wang**, Sichao Huang, Jie Zhou and Jiwen Lu
GE-Grasp: Efficient Target-Oriented Grasping in Dense Clutters
IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**), 2022

[31] Han Xiao, **Ziwei Wang**, Zheng Zhu, Jie Zhou, and Jiwen Lu
Shapley-NAS: Discovering Operation Contribution for Neural Architecture Search
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2022

[32] **Ziwei Wang**, Han Xiao, Jiwen Lu and Jie Zhou
Generalizable Mixed-Precision Quantization via Attribution Rank Preservation
IEEE International Conference on Computer Vision (**ICCV**), 2021

[33] **Ziwei Wang**, Yunsong Wang, Ziyi Wu, Jiwen Lu and Jie Zhou
Instance Similarity Learning for Unsupervised Feature Representation
IEEE International Conference on Computer Vision (**ICCV**), 2021

[34] **Ziwei Wang**, Quan Zheng, Jiwen Lu and Jie Zhou
Deep Hashing with Active Pairwise Supervision
European Conference on Computer Vision (**ECCV**), 2020

[35] **Ziwei Wang**, Ziyi Wu, Jiwen Lu and Jie Zhou
BiDet: An Efficient Binarized Object Detector
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2020

[36] **Ziwei Wang**, Jiwen Lu, Chenxin Tao and Jie Zhou
Learning Channel-wise Interactions for Binary Convolutional Neural Networks
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2019

[37] Yueqi Duan, **Ziwei Wang**, Jiwen Lu, Xudong Lin and Jie Zhou
GraphBit: Bitwise Interaction Mining via Deep Reinforcement Learning
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2018

[38] Yueqi Duan, Jiwen Lu, **Ziwei Wang**, Jianjiang Feng and Jie Zhou
Learning Deep Binary Descriptor with Multi-Quantization
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2017

Peer-Reviewed Journal Publications

[39] Zhenyu Wu, **Ziwei Wang**, Sichao Huang, Zhan Liu, Xiuwei Xu, Haibin Yan and Jiwen Lu
RoboPacker: An Autonomous Robotic Packing System for General Objects
IEEE Transactions on Automation Science and Engineering (**T-ASE**), 2025

[40] Xiuwei Xu, **Ziwei Wang**, Jie Zhou and 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

[41] Zhenyu Wu, **Ziwei Wang**, Shengyu Liu, Hao Luo, Jiwen Lu, Haibin Yan
FairScene: Learning Unbiased Object Interactions for Indoor Scene Synthesis
Pattern Recognition (**PR**), 2024

[42] Ruixuan Liu, Kangle Deng, **Ziwei Wang**, and Changliu Liu
StableLego: Stability Analysis of Block Stacking Assembly
IEEE Robotics and Automation Letters (**RAL**), 2024

[43] **Ziwei Wang**, Han Xiao, Jie Zhou and Jiwen Lu
Learning Generalizable Mixed-Precision Quantization via Attribution Imitation
International Journal of Computer Vision (**IJCV**), 2024

[44] Tianhao Wei, **Ziwei Wang**, Peizhi Niu, Abulikemu Abuduweili, Weiye Zhao, Casidhe Hutchison, Eric Sample, Changliu Liu
Improve Certified Training with Signal-to-Noise Ratio Loss to Decrease Neuron Variance and Increase Neuron Stability
Transactions on Machine Learning Research (**TMLR**), 2024

[45] Jingyi Zhang, **Ziwei Wang**, Haoyu Wang, Jie Zhou and Jiwen Lu
Anycost Network Quantization for Image Super-Resolution
IEEE Transactions on Image Processing (**T-IP**), 2024

[46] **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

[47] **Ziwei Wang**, Jiwen Lu, Han Xiao, Shengyu Liu and Jie Zhou
Learning Accurate Performance Predictors for Ultrafast Automated Model Compression
International Journal of Computer Vision (**IJCV**), 2023

[48] **Ziwei Wang**, Han Xiao, Yueqi Duan, Jie Zhou and Jiwen Lu
Learning Deep Binary Descriptors via Bitwise Interaction Mining
IEEE Transactions on Pattern Analysis and Machine Intelligence (**T-PAMI**), 2023

[49] Sichao Huang, **Ziwei Wang**, Jie Zhou and Jiwen Lu
Planning Irregular Object Packing via Hierarchical Reinforcement Learning
IEEE Robotics and Automation Letters (**RAL**), 2022

[50] **Ziwei Wang**, Jiwen Lu, Ziyi Wu and Jie Zhou
Learning Efficient Binarized Object Detectors with Information Compression
IEEE Transactions on Pattern Analysis and Machine Intelligence (**T-PAMI**), 2022

[51] **Ziwei Wang**, Jiwen Lu, and Jie Zhou
Learning Channel-wise Interactions for Binary Convolutional Neural Networks
IEEE Transactions on Pattern Analysis and Machine Intelligence (**T-PAMI**), 2021

[52] Yueqi Duan, Jiwen Lu, **Ziwei Wang**, Jianjiang Feng and Jie Zhou
Learning Deep Binary Descriptor with Multi-Quantization
IEEE Transactions on Pattern Analysis and Machine Intelligence (**T-PAMI**), 2019

Honors and Awards

- Outstanding Doctoral Dissertation of Beijing *2024*
- Outstanding Doctoral Dissertation of Tsinghua University *2023*

Teaching Experience

School of Electrical and Electronic Engineering, Nanyang Technological University
Tutor for Signals and Systems *2025*

School of Electrical and Electronic Engineering, Nanyang Technological University
Lecturer for Machine Learning Design and Application *2025*

Robotics Institute, Carnegie Mellon University
Guest lecturer for Safety in Provable Control *2024*

Academic Services

Membership

- Committee member of IEEE Robotics and Automation Society Chapter of Singapore

Journal Reviewer

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Robotics
- IEEE Transactions on Image Processing
- IEEE Transactions on Neural Networks and Learning Systems
- IEEE Transactions on Circuits and Systems for Video Technology
- IEEE Robotics and Automation Letters
- ACM Transactions on Graphics
- Journal of Field Robotics

Conference Reviewer

- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2020-2026)
- Neural Information Processing Systems (NeurIPS 2020-2025)
- IEEE International Conference on Computer Vision (ICCV 2021, 2023, 2025)
- European Conference on Computer Vision (ECCV 2022, 2024)
- International Conference on Machine Learning (ICML 2021-2026)
- International Conference on Representation Learning (ICLR 2021-2026)
- International Conference on Robotics and Automation (ICRA 2023-206)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2024-2025)
- Conference on Robot Learning (CoRL 2025)