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

Computer Vision, Machine Learning and Robotics

Publications

Peer-Reviewed Journal Publications

[1] 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

[2] 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

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

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

[5] 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

[6] 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

[7] **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

[8] **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

[9] **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

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

[11] **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

[12] **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

[13] 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

Peer-Reviewed Conference Publications

[14] 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

[15] 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

[16] 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**), 2025

[17] 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

[18] 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

[19] 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

[20] 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

[21] 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

[22] 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

[23] 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

[24] 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

[25] 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

[26] 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

[27] 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

[28] 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

[29] 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

[30] 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

[31] 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

[32] 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

[33] **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

[34] **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

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

[36] **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

[37] **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

[38] 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

[39] 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

Honors and Awards

o Outstanding Doctoral Dissertation of Beijing   *2024*

o Outstanding Doctoral Dissertation of Tsinghua University   *2023*

o National Scholarship   *2022*

o National Scholarship   *2020*

o Chi-Sun Yeh Scholarship   *2018*

o Qualcomm Scholarship   *2016*

Invited Talk

o **Efficient Policy Learning for General Bimanual Manipulation**
Embodied AI Workshop, DAI, 2024

o **Embodied Visual Perception in Unknown Environments**
Recent Advances in Video Content Understanding and Generation Tutorial, ECCV, 2024

o **Compact Visual Representation Learning**
Young Annual Conference of Chinese Association of Automation, 2021

Teaching Experience

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

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

Department of Automation, Tsinghua University
Teaching assistant for Pattern Recognition and Machine Learning   2022

Academic Services

Membership

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

Journal Reviewer

o IEEE Transactions on Pattern Analysis and Machine Intelligence

o IEEE Transactions on Image Processing

o IEEE Transactions on Neural Networks and Learning Systems

o IEEE Transactions on Circuits and Systems for Video Technology

o IEEE Robotics and Automation Letters

o ACM Transactions on Graphics

o Journal of Field Robotics

Conference Reviewer

- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2020-2025)

- 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 2021-2025)

- International Conference on Representation Learning (ICLR 2021-2025)

- International Conference on Robotics and Automation (ICRA 2023-2024)