Ziwei Wang

ziwei.wang@ntu.edu.sg • ziweiwangthu.github.io

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**, 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

[8] **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

[9] **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**), 2022

[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] 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

[15] 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

[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] 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

[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

[20] 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

[21] 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

[22] 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

[23] 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

[24] 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

[25] 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

[26] **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

[27] **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

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

[29] **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

[30] **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

[31] 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

[32] 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

- Outstanding Doctoral Dissertation of Tsinghua University, Tsinghua University *2023*
- National Scholarship, Ministry of Education of China *2022*
- National Scholarship, Ministry of Education of China *2020*
- Chi-Sun Yeh Scholarship, Tsinghua University *2018*
- Qualcomm Scholarship, Qualcomm *2016*

Invited Talk

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

Teaching Experience

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

Journal Reviewer

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- 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 2020-2024)
- Neural Information Processing Systems (NeurIPS 2020-2024)
- IEEE International Conference on Computer Vision (ICCV 2021, 2023)
- European Conference on Computer Vision (ECCV 2022, 2024)
- International Conference on Machine Learning (ICML 2021-2024)
- International Conference on Representation Learning (ICLR 2021-2024)
- International Conference on Robotics and Automation (ICRA 2023, 2024)