

# SHUZHAO XIE

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## RESEARCH INTEREST

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*Efficient 3D Vision, Robot Manipulation*

## EDUCATION

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### Tsinghua University

Ph.D. Student in Computer Science, Advisor: Zhi Wang

08/2024 – Current

### Tsinghua University

M.E. in Computer Technology, Advisor: Zhi Wang

08/2020 – 06/2023

### Beijing Normal University

B.S. in Computer Science and Technology

09/2016 – 07/2020

## EXPERIENCE

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### Efficient 3D Gaussian Splatting

Tsinghua SIGS, 10/2023 – Current

*3D Gaussian Compression, Mixed Precision Quantization*

[ECCV '24, ArXiv '24]

- Carefully designed pruning techniques and introduced Octree and RAHT to compress the 3D Gaussians.
- Proposed a block-wise way to quantize attributes and a well-crafted fine-tuning scheme to restore quality.
- Designed a tailored mixed-precision quantization for 3D Gaussians to further enhance the compression quality and implemented a CUDA module to accelerate the quantization process.

### Cost Efficient MLaaS Inference

Tsinghua SIGS, 07/2020 – 08/2023

*Multicloud-based Analytics*

[INFOCOM '22, TMM '24]

- Measured the performance (e.g., accuracy, throughput, and latency) of machine learning inference services (mainly object detection services) on AWS, Azure, Google Cloud, and Alibaba Cloud.
- Found the higher cost but occasionally lower accuracy problem under the multi-cloud environment and solved this NP-hard problem with the combinatorial reinforcement learning algorithm.
- Evaluation results show that our solution decreases the cost by 67% without any sacrifice to accuracy.

### Respiratory Disease Diagnosis

Healall, 06/2022 – 12/2024

*Respiratory Sound Classification*

[2 × ICASSP '25]

- Built a cloud service to support the respiratory sound classification model.
- Transferred multiple models to respiratory sound classification, including ResNet, Glance-and-Gaze, Faster-RCNN, and Conformer.

### Detection Model Deployment

Tencent, 01/2022 – 06/2022

*Faster RCNN, ML Deployment*

- Analyzed user data from Hupu and appended TFRecord to reduce the latency of model training.
- Implemented Faster-RCNN and deployed it with LibTorch and CUDA.
- Tested the latency and accuracy of object detection models on PyTorch, ONNX, OpenVino, and TensorRT.

## PUBLICATIONS/PREPRINTS

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### Conference & Journal Papers

1. MesonGS: Post-training Compression of 3D Gaussians via Efficient Attribute Transformation  
[Shuzhao Xie](#), Weixiang Zhang, Chen Tang, Yunpeng Bai, Rongwei Lu, Shijia Ge, and Zhi Wang  
*European Conference on Computer Vision (ECCV) 2024*, [Page] [PDF] [Code]

2. Cost Effective MLaaS Federation: A Combinatorial Reinforcement Learning Approach  
Shuzhao Xie, Yuan Xue, Yifei Zhu, and Zhi Wang  
*IEEE Conference on Computer Communications (INFOCOM) 2022*, [Page] [PDF] [Code]
3. SkyML: A MLaaS Federation Design for Multicloud-based Multimedia Analytics  
Shuzhao Xie, Yuan Xue, Yifei Zhu, and Zhi Wang  
*IEEE Transactions on Multimedia (TMM) 2024*, [PDF]
4. Enhancing Implicit Neural Representations via Symmetric Power Transformation  
Weixiang Zhang, Shuzhao Xie, Chengwei Ren, Shijia Ge, Mingzi Wang, Zhi Wang  
*The AAAI Conference on Artificial Intelligence (AAAI) 2025*, [PDF] [Code]
5. RFQuant: Retraining-free Model Quantization via One-Shot Weight-Coupling Learning  
Chen Tang, Yuan Meng, Jiacheng Jiang, Shuzhao Xie, Rongwei Lu, Xinzhu Ma, Zhi Wang, Wenwu Zhu  
*IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2024*, [PDF] [Code]
6. Lungmix: A Mixup-Based Strategy for Generalization in Respiratory Sound Classification  
Shijia Ge, Weixiang Zhang, Shuzhao Xie, Baixu Yan, Zhi Wang  
*IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2025*, [PDF]
7. PulmoScan: A Practical Pulmonary Disease Pre-Screening System  
Baixu Yan, Shijia Ge, Meizi Lu, Weixiang Zhang, Shuzhao Xie, Zhi Wang  
*IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2025*, [PDF]
8. A Joint Approach to Local Updating and Gradient Compression for Efficient Asynchronous FL  
Jiajun Song, Jiajun Luo, Rongwei Lu, Shuzhao Xie, Bin Chen, Zhi Wang, Wenwu Zhu  
*International European Conference on Parallel and Distributed Computing (Euro-Par) 2024*, [PDF]

## Under Review

1. SizeGS: Size-aware Compression of 3D Gaussians with Hierarchical Mixed Precision Quantization  
Shuzhao Xie, Jiahang Liu, Weixiang Zhang, Shijia Ge, Sicheng Pan, Chen Tang, Yunpeng Bai, Zhi Wang
2. Expansive Supervision for Neural Radiance Field  
Weixiang Zhang, Shuzhao Xie, Shijia Ge, Wei Yao, Chen Tang, Zhi Wang
3. Tuning-Free Visual Customization via View Iterative Self-Attention Control  
Xiaojie Li, Chenghao Gu, Shuzhao Xie, Yunpeng Bai, Weixiang Zhang, Zhi Wang
4. TextIR: A Simple Framework for Text-based Editable Image Restoration  
Yunpeng Bai, Cairong Wang, Shuzhao Xie, Chao Dong, Chun Yuan, Zhi Wang
5. EVOS: Efficient Implicit Neural Training via EVolutionary Selector  
Weixiang Zhang, Shuzhao Xie, Chengwei Ren, Siyi Xie, Chen Tang, Shijia Ge, Mingzi Wang, Zhi Wang
6. WATER-GS: Toward Copyright Protection for 3D Gaussian Splatting via Universal Watermarking  
Yuqi Tan, Xiang Liu, Shuzhao Xie, Bin Chen, Shu-Tao Xia, Zhi Wang
7. DragScene: Interactive 3D Scene Editing with Single-view Drag Instructions  
Chenghao Gu, Zhenzhe Li, Zhengqi Zhang, Yunpeng Bai, Shuzhao Xie, Zhi Wang

## PROFESSIONAL SERVICE AND TEACHING

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### Conference & Journal Reviewer

- CVPR: 2025
- ACM MM: 2024
- ICASSP: 2023-2025

### Teaching Assistant

- Big Data System (B), Tsinghua University, Fall 2021
- Distributed Machine Learning, Tsinghua University, Fall 2024

## SKILLS

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**Programming Languages:** Python, C/C++, Rust, Bash, XML, Java

**Tools and Frameworks:** Git, L<sup>A</sup>T<sub>E</sub>X, PyTorch, CUDA, Docker, Spark, Android