

Zhiwen Fan

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RESEARCH INTERESTS

My research focuses on advancing *spatial computing* and *immersive technologies* through the development of innovative *3D vision models*, which unifies key innovations in efficient few-shot learning, end-to-end 3D reconstruction, and semantic understanding. My current research interests include:

- Few-shot 3D learning: novel view synthesis, geometry reconstruction, and pose estimation
- Semantic 3D modeling and scene understanding
- Scalable 3D/4D asset generation and editing
- Efficient on-device 3D vision and SLAM
- Solving inverse problems in 3D reconstruction and computational imaging

EDUCATION

The University of Texas at Austin (UT Austin) Ph.D. Student, Electrical and Computer Engineering	Aug. 2021 - Present Advisor: Prof. Zhangyang “Atlas” Wang
Xiamen University Master, Electronic and Communication Engineering	Sep. 2016 - Jun. 2019 Advisor: Prof. Xinghao Ding
Shandong Agriculture University Bachelor, Electronic Information Science and Technology	Sep. 2012 - Jun. 2016

PROFESSIONAL EXPERIENCE

Meta Reality Lab Research Intern, Managers: Dr. Dilin Wang , Dr. Vikas Chandra	May. 2024 - Present
NVIDIA Research Research Intern, Managers: Prof. Yue Wang , Prof. Marco Pavone	Feb. 2024 - May. 2024
Google AR Research Intern, Managers: Dr. Sergio Orts-Escolano	May. 2022 - Aug. 2022
Alibaba Group (Full Time) Senior ML Algorithm Engineer, Managers: Prof. Ping Tan , Dr. Siyu Zhu	Jul. 2019 - Aug. 2021

SELECTED CONFERENCE PUBLICATIONS

Zhiwen Fan has co-authored over 50 papers in top-tier computer vision and machine learning venues (NeurIPS, ICML, ICLR, CVPR, ICCV, ECCV, TPAMI, TIP, AAAI, IROS, etc.). As of August 2024, his works have been **cited over 2,300 times** (single paper highest citation > 700), with an **h-index of 21** [Google Scholar].

Below are his selected publications: [†] denotes Zhiwen as the project lead; NAME denotes the author as his mentee; and * indicates an equal contribution.

NeurIPS 2024 [\[link\]](#): **Zhiwen Fan**[†], Jian Zhang*, Wenyan Cong, Peihao Wang, Renjie Li, Kairun Wen, Shijie Zhou, Achuta Kadambi, Zhangyang Wang, Danfei Xu, Boris Ivanovic, Marco Pavone, Yue Wang “Large Spatial Model: Real-time Unposed Images to Semantic 3D”

NeurIPS 2024 (Spotlight) [\[link\]](#): **Zhiwen Fan**[†], Kevin Wang*, Kairun Wen, Dejia Xu, Zehao Zhu, Zhangyang Wang, “LightGaussian: Unbounded 3D Gaussian Compression with 15x Reduction and 200+ FPS”

NeurIPS 2024 [\[link\]](#): Hezhen Hu, **Zhiwen Fan**, Tianhao Wu, Yihan Xi, Seoyoung Lee, Georgios Pavlakos, Zhangyang Wang “Expressive Gaussian Human Avatars from Monocular RGB Video”

ECCV 2024 [\[link\]](#): **Zhiwen Fan**[†], Zehao Zhu*, Yifan Jiang, Zhangyang Wang, Suyu You, Zhangyang Wang, Achuta Kadambi “FSGS: Real-Time Few-shot View Synthesis using Gaussian Splatting”

ECCV 2024 [\[link\]](#): **Zhiwen Fan***, Shijie Zhou*, Dejie Xu*, Haoran Chang, Pradyumna Chari, Tejas Bhargava, Suyu You, Zhangyang Wang, Achuta Kadambi “DreamScene360: Unconstrained Text-to-3D Scene Generation with Panoramic Gaussian Splatting ”

ECCV 2024 [\[link\]](#): Renjie Li, **Zhiwen Fan***[†], Bohua Wang, Peihao Wang, Zhangyang Wang, Xi Wu “VersatileGaussian: Real-time Neural Rendering for Versatile Tasks using Gaussian Splatting”

IROS 2024 [\[link\]](#): Lisong C Sun, Neel P Bhatt, Jonathan C Liu, **Zhiwen Fan**, Zhangyang Wang, Todd E Humphreys, Ufuk Topcu “MM3DGS SLAM: Multi-modal 3D Gaussian Splatting for SLAM Using Vision, Depth, and Inertial Measurements ”

CVPR 2024 [\[link\]](#): Mukund Varma T, Peihao Wang, **Zhiwen Fan**, Zhangyang Wang, Hao Su, Ravi Ramamoorthi “Lift3D: Zero-Shot Lifting of Any 2D Vision Model to 3D ”

CVPR 2024 [\[link\]](#): Peihao Wang, Dejie Xu, **Zhiwen Fan**, Dilin Wang, Sreyas Mohan, Forrest Iandola, Rakesh Ranjan, Yilei Li, Qiang Liu, Zhangyang Wang, Vikas Chandra “Taming Mode Collapse in Score Distillation for Text-to-3D Generation”

CVPR 2024 (Highlight) [\[link\]](#): Shijie Zhou, Haoran Chang, Sicheng Jiang, **Zhiwen Fan**, Zehao Zhu, Dejie Xu, Pradyumna Chari, Suyu You, Zhangyang Wang, Achuta Kadambi “Feature 3DGS: Supercharging 3D Gaussian Splatting to Enable Distilled Feature Fields” (Press Release by UCLA News)

3DV 2024 [\[link\]](#): **Zhiwen Fan** ^{*†}, Panwang Pan*, Brandon Y Feng, Peihao Wang, Chenxin Li, Zhangyang Wang “Learning to Estimate 6DoF Pose from Limited Data: A Few-Shot, Generalizable Approach using RGB Images”

ICCV 2023 [\[link\]](#): Chenxin Li*, Brandon Y Feng*, **Zhiwen Fan***[†], Zhangyang Wang, “StegaNeRF: Embedding Invisible Information within Neural Radiance Fields”

ICCV 2023 [\[link\]](#): Wenyan Cong, Hanxue Liang, Peihao Wang, **Zhiwen Fan**, Tianlong Chen, Mukund Varma, Yi Wang, Zhangyang Wang, “Enhancing NeRF akin to Enhancing LLMs: Generalizable NeRF Transformer with Mixture-of-View-Experts”

CVPR 2023 (Highlight) [\[link\]](#): Dejie Xu, Yifan Jiang, Peihao Wang, **Zhiwen Fan**, Yi Wang, Zhangyang Wang, “NeuralLift-360: Lifting An In-the-wild 2D Photo to A 3D Object with 360 Views”

ICLR 2023 [\[link\]](#): **Zhiwen Fan**, Peihao Wang, Xinyu Gong, Yifan Jiang, Dejie Xu, Zhangyang Wang, “NeRF-SOS: Any-View Self-supervised Object Segmentation from Complex Real-World Scenes”

ASP-DAC 2023 [\[link\]](#): Yimeng Zhang*, Akshay Karkal Kamath*, Qiucheng Wu*, **Zhiwen Fan***, Wuyang Chen, Zhangyang Wang, Shiyu Chang, Sijia Liu, Cong Hao, “Data-Model-Circuit Tri-Design for Ultra-Light Video Intelligence on Edge Devices”

NeurIPS 2022 [\[link\]](#): Hanxue Liang*, **Zhiwen Fan***, Rishov Sarkar, Ziyu Jiang, Tianlong Chen, Kai Zou, Yu Cheng, Cong Hao, Zhangyang Wang, “M³ViT: Mixture-of-Experts Vision Transformer for Efficient Multi-task Learning with Model-Accelerator Co-design” (Its hardware prototype won 3rd place for “University Demo Best Demonstration” at DAC 2022)

NeurIPS 2022 [\[link\]](#): Dejie Xu, Peihao Wang, Yifan Jiang, **Zhiwen Fan**, Zhangyang Wang, “Signal Processing for Implicit Neural Representations”

ECCV 2022 [\[link\]](#): **Zhiwen Fan***, Yifan Jiang*, Peihao Wang*, Xinyu Gong, Dejie Xu, Zhangyang Wang, “Unified Implicit Neural Stylization”

ECCV 2022 [\[link\]](#): Dejie Xu*, Yifan Jiang*, Peihao Wang, **Zhiwen Fan**, Humphrey Shi, Zhangyang Wang, “SinNeRF: Training Neural Radiance Fields on Complex Scenes from a Single Image”

ECCV 2022 [\[link\]](#): Hanxue Liang , Hehe Fan, **Zhiwen Fan**, Yi Wang, Tianlong Chen, Yu Cheng, Zhangyang Wang, “Point Cloud Domain Adaptation via Masked Local 3D Structure Prediction”

ICML 2022 [\[link\]](#): Peihao Wang, **Zhiwen Fan**, Tianlong Chen, Zhangyang Wang, “Neural Implicit Dictionary Learning via Mixture-of-Expert Training”.

CVPR 2022(Oral) [\[link\]](#): **Zhiwen Fan**, Tianlong Chen, Peihao Wang, Zhangyang Wang, “CADTransformer: Panoptic Symbol Spotting Transformer for CAD Drawings”.

CVPR 2022 [\[link\]](#): Tianlong Chen, Peihao Wang, **Zhiwen Fan**, Zhangyang Wang, “Aug-NeRF: Training Stronger Neural Radiance Fields with Triple-Level Physically-Grounded Augmentations”.

3DV 2021 [\[link\]](#): Rakesh Shrestha, **Zhiwen Fan**, Qingkun Su, Zuozhuo Dai, Siyu Zhu, Ping Tan, “MeshMVS: Multi-View Stereo Guided Mesh Reconstruction”.

ICCV 2021 [\[link\]](#): **Zhiwen Fan***, Lingjie Zhu*, Honghua Li, Xiaohao Chen, Siyu Zhu, Ping Tan, “FloorPlanCAD: A Large-Scale CAD Drawing Dataset for Panoptic Symbol Spotting”.

CVPR 2020(Oral) [\[link\]](#): **Zhiwen Fan***, Xiaodong Gu*, Siyu Zhu, Zuozhuo Dai, Feitong Tan, Ping Tan “Cascade Cost Volume for High-Resolution Multi-View Stereo and Stereo Matching”.

ECCV 2018 [\[link\]](#): **Zhiwen Fan***, Liyan Sun*, Xinghao Ding, Yue Huang, Congbo Cai, John Paisley, “A Segmentation-aware Deep Fusion Network for Compressed Sensing MRI”.

AAAI 2018 [\[link\]](#): Liyan Sun*, **Zhiwen Fan***, Yue Huang, Xinghao Ding, John Paisley “Compressed Sensing MRI Using a Recursive Dilated Network”.

PREPRINTS

Preprint [\[link\]](#): Renjie Li, Panwang Pan, Dejia Xu, Shijie Zhou, Xuanyang Zhang, Zeming Li, Achuta Kadambi, Zhangyang Wang, **Zhiwen Fan** “4K4DGen: Panoramic 4D Generation at 4K Resolution”, submitted to NeurIPS 2024.

Preprint [\[link\]](#): **Zhiwen Fan**, etc. “InstantSplat: Sparse-view SfM-free Gaussian Splatting in Seconds”, submitted to NeurIPS 2024.

SELECTED JOURNAL PUBLICATIONS

TIP 2019 [\[link\]](#): Liyan Sun, **Zhiwen Fan**, Xueyang Fu, Yue Huang, Xinghao Ding, John Paisley, “A deep information sharing network for multi-contrast compressed sensing MRI reconstruction”, Transactions on Image Processing.

MRI 2019 [\[link\]](#): Liyan Sun, **Zhiwen Fan**, Xinghao Ding, Yue Huang, John Paisley, “Region-of-interest undersampled MRI reconstruction: A deep convolutional neural network approach”, Magnetic Resonance Imaging.

MRI 2019 [\[link\]](#): Liyan Sun, **Zhiwen Fan**, Xinghao Ding, Congbo Cai, Yue Huang, John Paisley “A divide-and-conquer approach to compressed sensing MRI”, Magnetic Resonance Imaging.

HONORS

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|---|-----------|
| • Qualcomm Innovation Fellowship [Qualcomm News] [UT News] | Aug. 2022 |
| • Professional Development Award, UT Austin | Jul. 2022 |
| • 3rd place, “Best University Demo” Competition, Design Automation Conference (DAC) | Jul. 2022 |
| • Outstanding Graduates of Xiamen University | Jun. 2019 |
| • AAAI 2018 Travel Award | Jan. 2018 |

INVITED TALKS

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| • “Spatial Intelligence via Reconstruction, Distillation, and Generation” @ Shanghai AI Lab | July. 2024 |
| • “Streamlined 3D/4D: From Hours to Seconds to Millisecond” @ Google Research | May. 2024 |
| • “Streamlined 3D/4D: From Hours to Seconds to Millisecond” @ VALSE Webinar | May. 2024 |
| • “Real-Time Few-shot View Synthesis using Gaussian Splatting” @ IARPA WRIVA Workshop | Apr. 2024 |
| • “Data-efficient and Rendering-efficient Neural Rendering” @ IFML Workshop on Generative AI | Nov. 2023 |
| • “Unified Implicit Neural Stylization” @ Xiamen University; Kungfu.ai. | Jul. 2022 |

SERVICES AND MENTORING

Reviewer: TPAMI, TIP, NeurIPS, ICML, ICLR, CVPR, ICCV, ECCV, SIGGRAPH, SIGGRAPH Asia, AAAI

Student Mentoring:

- Kevin Wang (Now PhD Student at UT Austin)
- Hanxue Liang (Now PhD Student at Cambridge)
- Renjie Li (Now PhD Student at TAMU)

- Chenxin Li (Now PhD Student at CUHK)
- Panwang Pan (Now Researcher at Pico)