Zhiwen Fan

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RESEARCH INTERESTS

Computer Vision (CV):

- 3D reconstruction & perception
- Scalable and seamless 3D/4D generation (Omnidirectional)
- Inverse problems (e.g., Compressed sensing MRI)

Machine Learning (ML) and Optimization:

- Efficient training/inference (e.g., Dynamic routing)
- Trustworthy ML (e.g., Steganography)

Interdisciplinary Applications:

- Hardware-software co-design
- Tissues reconstruction (e.g., Endoscopic reconstruction)
- Medical image understanding (e.g., Brain tumor segmentation)
- Symbolic representation and spotting
- LLMs for spatial reasoning

PREPRINTS

Preprint [link]: **Zhiwen Fan, etc.** "`Large Spatial Model:Real-time Unposed Images to Semantic 3D`"

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`"

Preprint [link]: **Zhiwen Fan, etc.** "`InstantSplat: Sparse-view SfM-free Gaussian Splatting in Seconds`"

Preprint [link]: **Zhiwen Fan, etc.** "`LightGaussian: Unbounded 3D Gaussian Compression with 15x Reduction and 200+ FPS`"

Preprint [link]: Hezhen Hu, **Zhiwen Fan, etc.** "`Expressive Gaussian Human Avatars from Monocular RGB Video`"

SELECTED CONFERENCE PUBLICATIONS

Zhiwen Fan has co-authored over 50 papers in top-tier computer vision, machine learning, and medical imaging venues (`CVPR`, `ICCV`, `ECCV`, `TPAMI`, `TIP`, `NeurIPS`, `ICML`, `ICLR`, `AAAI`, `ICCAD`, `IPMI`, etc.). As of 07/2024, his works have been cited over 2,200 times, with an h-index of 21 [Google Scholar]. Below are his selected publications: † **denotes Zhiwen as the project lead, while NAME denotes the author is his mentee;** * **indicates an equal contribution.**

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

ECCV 2024 (Accepted) [link]: Zehao Zhu*, **Zhiwen Fan***†, Yifan Jiang, Zhangyang Wang, Suya You, Zhangyang Wang, Achuta Kadambi "`FSGS: Real-Time Few-shot View Synthesis using Gaussian Splatting`"

ECCV 2024 (Accepted) [link]: Shijie Zhou*, **Zhiwen Fan***, Dejia Xu*, Haoran Chang, Pradyumna Chari, Tejas Bharadwaj, Suya You, Zhangyang Wang, Achuta Kadambi "`DreamScene360: Unconstrained Text-to-3D Scene Generation with Panoramic Gaussian Splatting` "

IROS 2024 (Accepted) [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, Dejia 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, Dejia Xu, Pradyumna Chari, Suya You, Zhangyang Wang, Achuta Kadambi "Feature 3DGS: Supercharging 3D Gaussian Splatting to Enable Distilled Feature Fields"

ICCAD 2023 [link]: Stefan Abi-Karam, Rishov Sarkar, Dejia Xu, **Zhiwen Fan**, Zhangyang Wang, Cong Hao, "INR-Arch: A Dataflow Architecture and Compiler for Arbitrary-Order Gradient Computations in Implicit Neural Representation Processing"

ICCAD 2023 [link]: Rishov Sarkar, Hanxue Liang, **Zhiwen Fan**, Zhangyang Wang, Cong Hao, "Edge-MoE: Memory-Efficient Multi-Task Vision Transformer Architecture with Task-Level Sparsity via Mixture-of-Experts"

3DV 2023 [link]: Panwang Pan*, **Zhiwen Fan** *†, 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 (Hightlight) [link]: Dejia 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, Dejia 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, "M^{3}ViT: Mixture-of-Experts Vision Transformer for Efficient Multi-task Learning with Model-Accelerator Co-design"

NeurIPS 2022 [link]: Dejia 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, Dejia Xu, Zhangyang Wang, "Unified Implicit Neural Stylization"

ECCV 2022 [link]: Dejia 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]: Xiaodong Gu*, **Zhiwen Fan***, Siyu Zhu, Zuozhuo Dai, Feitong Tan, Ping Tan "Cascade Cost Volume for High-Resolution Multi-View Stereo and Stereo Matching".

IPMI 2019 [link]: Liyan Sun*, **Zhiwen Fan***, Xinghao Ding, Yue Huang, John Paisley "`Joint CS-MRI reconstruction and segmentation with a unified deep network`".

ACM MM 2019 [link]: **Zhiwen Fan***, Huafeng Wu*, Xueyang Fu, Yue Huang, Xinghao Ding "`Residual-guide network for single image deraining`".

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`".

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".

PROFESSIONAL EXPERIENCE

Meta Reality Lab (Research Intern) May. 2024 - Present

NVIDIA Research (Research Intern) Feb. 2024 - May. 2024

Meta Reality Lab (Research Intern) May. 2023 - Aug. 2023

Google AR (Research Intern) May. 2022 - Aug. 2022

The University of Texas at Austin (Research Assistant) Aug. 2021 - Present

Alibaba Group, China Jul. 2019 - Aug. 2021
Senior Algorithm Engineer, Managers: Prof. Ping Tan, Dr. Siyu Zhu

EDUCATION

The University of Texas at Austin (UT Austin) Aug. 2021 - Present
Ph.D. Student, Electrical and Computer Engineering Advisor: Prof. Zhangyang (Atlas) Wang

Xiamen University (XMU) Sep. 2016 - Jun. 2019
Master, Electronic and Communication Engineering Advisor: Prof. Xinghao Ding

Shandong Agriculture University (SDAU) Sep. 2012 - Jun. 2016
Bachelor, Electronic Information Science and Technology

HONORS

Fellowship & Awards

- **Qualcomm Innovation Fellowship** [Qualcomm News] [UT News] Aug. 2022
- Professional Development Award of UT Austin Jul. 2022
- 3rd place of University Demo Best Demonstration at 59th Design Automation Conference Jul. 2022
- Outstanding Graduates of Xiamen University Jun. 2019
- The First Prize Scholarship of Xiamen University 2016-2018
- AAAI 2018 Travel Award Jan. 2018
- Outstanding Graduates of Shandong Province Jun. 2016

INVITED TALKS

- "Streamlined 3D/4D: From Hours to Seconds to Millisecond" @ VALSE Webinar, talk and panel available (in Chinese) May. 2024
- "Unified Implicit Neural Stylization" @ Xiamen University and Kungfu.ai. Jul. 2022

SERVICES

Journal Reviewer: TPAMI, TIP, IJCV, Neurocomputing

Conference Reviewer: NeurIPS'22, ECCV'22, ICML'22, CVPR'22, ICCV'21, AAAI'21, ICME'19