

Junyi Wu

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Chicago, Illinois - 60607, United States

RESEARCH INTERESTS

- **Embodied AI:** Manipulation, Robot Foundation Models
- **3D Vision:** Dynamic Scene Reconstruction, Semantic Understanding, Motion Modeling
- **Visual Generation:** Efficient Diffusion Models
- **Explainable AI:** Transformer Explainability

EXPERIENCE

• United Imaging Intelligence

May 2025 - Aug. 2025

Boston, United States

Research Intern, Supervisor: Benjamin Planche, Van Nguyen Nguyen, Ziyan Wu

- Developed a unified framework for 4D scene reconstruction and understanding.
- Achieved fine-grained object tracking and open-vocabulary semantic segmentation across time and views in 4D.
- Integrated instance segmentation (via SAM) and vision-language semantics (via CLIP) with 4D Gaussian.
- Explored 3D reconstruction methods like NeRF, Gaussian Splatting, and VGGT for multi-view consistency.
- Build wheels for a novel and efficient multi-modal rasterization pipeline based on C/C++ and CUDA.

• SenseTime

Feb. 2022 - Aug. 2022

Shenzhen, China

Research Intern, Supervisor: Ze Pan, Wenxiu Sun

- Developed advanced video frame interpolation models for high-frame-rate film production.
- Designed multi-scale optical flow estimation modules to handle large and non-linear motion.
- Conducted experiments on public and proprietary datasets, optimized network architectures for improved interpolation quality.

EDUCATION

• University of Illinois Chicago

Ph.D. Student in Computer Science, Advisor: Prof. Yan Yan

Jan. 2023 - Dec. 2027 (Expected)

Chicago, United States

• University of Central Florida

Visiting Student in Computer Science, Advisor: Prof. Mubarak Shah

Jan. 2024 - Jul. 2024

Orlando, United States

• Sun Yat-sen University

B.Sc. in Information and Computing Science, GPA: 4.5/5, Rank: 1/128

Sep. 2018 - Jun. 2022

Zhuhai, China

PUBLICATIONS

C=CONFERENCE, U=UNDER REVIEW

- [U.1] Junyi Wu, Benjamin Planche, Van Nguyen Nguyen, Jiachen Tao, Yan Yan, Ziyan Wu **Consistent Instance Field for Dynamic Scene Understanding.**
- [C.1] Junyi Wu, Jiachen Tao, Haoxuan Wang, Gaowen Liu, Ramana Rao Kompella, Yan Yan **Orientation-anchored Hyper-Gaussian for 4D Reconstruction from Casual Videos.** NeurIPS'25.
- [C.2] Feiran Wang*, Jiachen Tao*, Junyi Wu*, Haoxuan Wang, Bin Duan, Kai Wang, Zongxin Yang, Yan Yan **X-Field: A Physically Grounded Representation for 3D X-ray Reconstruction.** NeurIPS'25 (Spotlight).
- [C.3] Feiran Wang, Junyi Wu, Dawen Cai, Yuan Hong, Yan Yan **CogniMap3D: Cognitive 3D Mapping and Rapid Retrieval.** ICLR'26.
- [U.2] Haoxuan Wang, Jiachen Tao, Junyi Wu, Gaowen Liu, Ramana Rao Kompella, Yan Yan **Motion Marionette: Rethinking Motion Transfer via Prior Guidance.**
- [U.3] Jiachen Tao, Junyi Wu, Haoxuan Wang, Zongxin Yang, Dawen Cai, Yan Yan **TraceFlow: Dynamic 3D Reconstruction of Specular Scenes Driven by Ray Tracing.**
- [U.4] Jiachen Tao, Benjamin Planche, Van Nguyen Nguyen, Junyi Wu, Yan Yan, Ziyan Wu **From Particles to Fields: Reframing Photon Mapping with Continuous Gaussian Photon Fields.**
- [C.4] Junyi Wu*, Haoxuan Wang*, Yuzhang Shang, Mubarak Shah, Yan Yan **PTQ4DiT: Post-training Quantization for Diffusion Transformers.** NeurIPS'24.

- [C.5] Haoxuan Wang, Yuzhang Shang, Zhihang Yuan, Junyi Wu, Junchi Yan, Yan Yan **QuEST: Low-bit Diffusion Model Quantization via Efficient Selective Finetuning**. ICCV'25.
- [C.6] Junyi Wu, Bin Duan, Weitai Kang, Hao Tang, Yan Yan **Token Transformation Matters: Towards Faithful Post-hoc Explanation for Vision Transformer**. CVPR'24.
- [C.7] Junyi Wu, Weitai Kang, Hao Tang, Yuan Hong, Yan Yan **On the Faithfulness of Vision Transformer Explanations**. CVPR'24.
- [C.8] Weitai Kang, Luowei Zhou, Junyi Wu, Changchang Sun, Yan Yan **AttBalance: Visual Grounding with Attention-Driven Constraint Balancing**. ACMMM'25.
- [C.9] Zhenghao Zhao, Haoxuan Wang, Junyi Wu, Yuzhang Shang, Gaowen Liu, Yan Yan **Efficient Multimodal Dataset Distillation via Generative Models**. NeurIPS'25.
- [C.10] Haoxuan Wang, Zhenghao Zhao, Junyi Wu, Yuzhang Shang, Gaowen Liu, Yan Yan **CaO2: Rectifying Inconsistencies in Diffusion-Based Dataset Distillation**. ICCV'25.
- [C.11] Zhenghao Zhao, Yuzhang Shang, Junyi Wu, Yan Yan **Dataset Quantization with Active Learning based Adaptive Sampling**. ECCV'24.

HONORS AND AWARDS

• Outstanding Graduate <i>Sun Yat-sen University</i>	2022
• National Scholarship <i>Sun Yat-sen University</i>	2020 - 2021
• First Prize Student Scholarship <i>Sun Yat-sen University</i>	2019 - 2022
• Erudition Scholarship of School of Mathematics <i>Sun Yat-sen University</i>	2019

SKILLS

- **Programming:** Python (PyTorch), C/C++, CUDA
- **Language:** English, Mandarin, Cantonese, Teochew

SERVICES

Conference Reviewer: CVPR'24/25/26, ICCV'25, ECCV'24, NeurIPS'24/25, ICLR'24/25/26, ICML'24, ACMMM'25.

Journal Reviewer: TPAMI, CVIU, TCSVT.

Guest Instructor: Energy-Efficient Deep Learning (CS 594), Deep Learning (CS 577), Advanced Machine Learning (CS 512), Machine Learning (CS 412).

Workshop Program Committee: Advanced Perception for Autonomous Healthcare (APAH@ICCV2025).