Junyi Wu

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Chicago, Illinois - 60607, United States

Research Interests

- **3D Vision**: Dynamic Scene Reconstruction and Understanding.
- **Visual Generation**: Diffusion Model Quantization.
- **Explainable AI**: Transformer Explainability.

Experience

- **United Imaging Intelligence** *May 2025 - Present*
  Research Intern, Supervisor: Benjamin Planche, Van Nguyen Nguyen, Ziyan Wu Boston, United States
  - 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), open-vocabulary semantics (via CLIP), and temporal reasoning (via MLLM) with 4D Gaussian representation.
  - Explored 3D reconstruction methods like NeRF, Gaussian Splatting, and VGGT.
  - Build wheels for a novel and efficient multi-modal rasterization pipeline based on C/C++ and CUDA.
- **SenseTime** *Feb. 2022 - Aug. 2022*
  Research Intern, Supervisor: Ze Pan, Wenxiu Sun Shenzhen, China
  - 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** *Jan. 2023 - Dec. 2027 (Expected)*
  Ph.D. Student in Computer Science, Advisor: Prof. Yan Yan Chicago, United States
- **University of Central Florida** *Jan. 2024 - Jul. 2024*
  Visiting Student in Computer Science, Advisor: Prof. Mubarak Shah Orlando, United States
- **Sun Yat-sen University** *Sep. 2018 - Jun. 2022*
  B.Sc. in Information and Computing Science, GPA: 4.5/5, Rank: 1/128 Zhuhai, China

Publications

C=Conference, U=Under Review

[U.1] **Junyi Wu**, Benjamin Planche, Van Nguyen Nguyen, Zhongpai Gao, Meng Zheng, Anwesa Choudhuri, Terrence Chen, Yan Yan, Ziyan Wu **Anchoring Semantics in Time: Instance-Consistent 4D Gaussian Splatting 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] **Junyi Wu***, Haoxuan Wang*, Yuzhang Shang, Mubarak Shah, Yan Yan **PTQ4DiT: Post-training Quantization for Diffusion Transformers**. NeurIPS'24.

[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** .

[C.4] **Junyi Wu**, Bin Duan, Weitai Kang, Hao Tang, Yan Yan **Token Transformation Matters: Towards Faithful Post-hoc Explanation for Vision Transformer** . CVPR'24.

[C.5] **Junyi Wu**, Weitai Kang, Hao Tang, Yuan Hong, Yan Yan **On the Faithfulness of Vision Transformer Explanations** . CVPR'24.

[U.4] Feiran Wang, **Junyi Wu**, Dawen Cai, Yuan Hong, Yan Yan **CogniMap3D: Cognitive 3D Mapping and Rapid Retrieval** .

[C.6] 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.7] Weitai Kang, Luowei Zhou, **Junyi Wu**, Changchang Sun, Yan Yan **AttBalance: Visual Grounding with Attention-Driven Constraint Balancing**. ACMMM'25.

[C.8] Zhenghao Zhao, Haoxuan Wang, **Junyi Wu**, Yuzhang Shang, Gaowen Liu, Yan Yan **Efficient Multimodal Dataset Distillation via Generative Models**. NeurIPS'25.

[C.9] Haoxuan Wang, Zhenghao Zhao, **Junyi Wu**, Yuzhang Shang, Gaowen Liu, Yan Yan **CaO2: Rectifying Inconsistencies in Diffusion-Based Dataset Distillation**. ICCV'25.

[C.10] Zhenghao Zhao, Yuzhang Shang, **Junyi Wu**, Yan Yan **Dataset Quantization with Active Learning based Adaptive Sampling**. ECCV'24.

Honors and Awards

- **Outstanding Graduate** *2022*
  Sun Yat-sen University
- **National Scholarship** *2020 - 2021*
  Sun Yat-sen University
- **First Prize Student Scholarship** *2019 - 2022*
  Sun Yat-sen University
- **Erudition Scholarship of School of Mathematics** *2019*
  Sun Yat-sen University

Skills

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

Services

Conference Reviewer: CVPR'24/25, ICCV'25, ECCV'24, NeurIPS'24/25, ICLR'24/25, 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).