# 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* Boston, United States
  - Developed a unified framework for 4D scene reconstruction and understanding.
  - Explored 3D reconstruction methods like NeRF, Gaussian Splatting, and VGGT for better multi-view consistency.
  - Integrated instance segmentation (via SAM) and vision-language semantics (via CLIP) with 4D Gaussian.
  - Build wheels for a novel and efficient multi-modal rasterization pipeline based on C/C++ and CUDA.
  - Achieved fine-grained object tracking and open-vocabulary semantic segmentation across time and views in 4D.
- **SenseTime** *Feb. 2022 - Aug. 2022*
  *Research Intern, Supervisor: 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 - Present*
  *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

Junyi Wu has co-authored xxx papers in top-tier computer vision and machine learning venues (CVPR, NeurIPS, ICCC, ECCV, ACMMM, etc.) and published 14 first-authored papers. Below are his publications: * indicates equal contribution. Full list of publications at **Google Scholar**.

**[U.1]** **Changchang Sun**, Ren Wang, Yihua Zhang, Jinghan Jia, Jiancheng Liu, Gaowen Liu, Yan Yan, Sijia Liu. **Forget Vectors at Play: Universal Input Perturbations Driving Machine Unlearning in Image Classification**.

**[C.1]** **Changchang Sun**, Gaowen Liu, Charles Fleming, Yan Yan. **Enhancing Dance-to-Music Generation via Negative Conditioning Latent Diffusion Model**. CVPR'25.

**[C.2]** **Changchang Sun**, Jialie Shen, Gaowen Liu, Aihua Zheng, Yan Yan. **Tie-Breaking Conflict-Ease Cross-Modal Hashing** . ICIP'25.

**[C.3]** **Changchang Sun**, Bin Duan, Hugo Latapie, Gaowen Liu, Yan Yan. **DCT: Divide-and-Conquer Transformer Network with Knowledge Transfer for Query-driven HOI Detection**. ICMR'24.

**[C.4]** Nikhil Sharma, **Changchang Sun**, Zhenghao Zhao, Anne Hee Hiong Ngu, Hugo Latapie, Yan Yan. **SSDL: Sensor-to-Skeleton Diffusion Model with Lipschitz Regularization for Human Activity Recognition**. MMM'24.

**[C.5]** Zhiliang Wu, **Changchang Sun**, Hanyu Xuan, Gaowen Liu, Yan Yan. **WaveFormer: Wavelet Transformer for Noise-Robust Video Inpainting**. AAAI'24.

**[C.6]** Bin Duan, Hao Tang, **Changchang Sun**, Ye Zhu, Yan Yan. **Mining and Unifying Heterogeneous Contrastive Relations for Weakly-Supervised Actor-Action Segmentation**. WACV'24.

**[C.7]** Zhiliang Wu, Kang Zhang, **Changchang Sun**, Hanyu Xuan, Yan Yan. **Flow-guided deformable alignment network with self-supervision for video inpainting**. WACV'24.

**[J.1]** Xuemeng Song, Chun Wang, **Changchang Sun**, Shanshan Feng, Min Zhou, Liqiang Nie. **MM-FRec: Multi-modal enhanced fashion item recommendation**. TKDE'23.

**[C.8]** Zhiliang Wu, **Changchang Sun**, Hanyu Xuan, Yan Yan. **Deep stereo video inpainting**. CVPR'23.

**[C.9]** Hao Ding, **Changchang Sun**, Hao Tang, Dawen Cai, Yan Yan. **Few-shot medical image segmentation with cycle-resemblance attention**. WACV'23.

**[C.10]** Zhiliang Wu, Hanyu Xuan, **Changchang Sun**, Weili Guan, Kang Zhang, Yan Yan. **Semi-supervised video inpainting with cycle consistency constraints**. CVPR'23.

**[J.2]** Zhiliang Wu, **Changchang Sun**, Hanyu Xuan, Kang Zhang, Yan Yan. **Divide-and-conquer completion network for video inpainting**. TCSVT'22.

**[C.11]** Junsheng Wang, Tiantian Gong, Zhixiong Zeng, **Changchang Sun**, Yan Yan. **C3CMR: Cross-Modality Cross-Instance Contrastive Learning for Cross-Media Retrieval**. ACMMM'22.

**[C.12]** **Changchang Sun**, Hugo Latapie, Gaowen Liu, Yan Yan. **Deep normalized cross-modal hashing with bi-direction relation reasoning**. CVPR'22.

**[J.3]** Peng Zhan, **Changchang Sun**, Yupeng Hu, Wei Luo, Jiecai Zheng, Xueqing Li. **Feature-based online representation algorithm for streaming time series similarity search**. PRAI'20.

**[C.13]** Fan Liu, Zhiyong Cheng, **Changchang Sun**, Yinglong Wang, Liqiang Nie, Mohan Kankanhalli. **User diverse preference modeling by multimodal attentive metric learning**. ACMMM'19.

**[C.14]** **Changchang Sun**, Xuemeng Song, Fuli Feng, Wayne Xin Zhao, Hao Zhang, Liqiang Nie. **Supervised hierarchical cross-modal hashing**. SIGIR'19.

## 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).