

Xian Liu

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WORKING EXPERIENCE

- **Omni Model Pretrain Team, xAI** Seattle, United States
Member of Technical Staff. Dec. 2025 - Now
- **Deep Imagination Research Group, NVIDIA Research** Santa Clara, United States
Research Scientist. Jun. 2024 - Dec. 2025

EDUCATION

- **The Chinese University of Hong Kong** Hong Kong SAR, China
Ph.D., Multimedia Laboratory (MMLab). Supervisor: Prof. Dahua Lin, Ziwei Liu, Xihui Liu 2021 – 2025
- **Zhejiang University** Hangzhou, China
B.S. in Computer Science; Minor in ACEE, Chu Ko Chen Honored Class. Rank: 1/154 2017 – 2021

RESEARCH INTERESTS

GenAI Pre-/Post-training, Vision-Language Models, Visual Tokenizers, Image/Video Generative Models

INDUSTRIAL RESEARCH

- **Cosmos: World Foundation Model Platform for Physical AI**
NVIDIA Cosmos Team: Xian Liu (Core Contributor). **(CES'25 Best of AI, Best Overall)**
Contributions: Auto-Regressive Foundation Model Pre-Training & Post-Training.
- **Cosmos 2.5: Improved World Simulation with Video Foundation Models for Physical AI**
NVIDIA Cosmos Team: Xian Liu (Core Contributor).
Contributions: Data Processing Pipelines, Captioning, Long Video Generation, Evaluation, Transfer Post-training.
- **Cosmos Tokenizer: A Suite of Image and Video Neural Tokenizers**
NVIDIA Cosmos Team: Xian Liu (Core Contributor).
Contributions: Continuous/Discrete Image/Video Tokenizers.
- **Cosmos-Transfer: Conditional World Generation with Adaptive Multimodal Control**
NVIDIA Cosmos Team: Xian Liu (Core Contributor).
Contributions: Adaptive Multi-Modal Control, Data Processing Pipelines, Open-Source Repo.

CONFERENCE PUBLICATIONS

(* denotes equal contribution)

- **HumanGaussian: Text-Driven 3D Human Generation with Gaussian Splatting**
Xian Liu, Xiaohang Zhan, Jiaxiang Tang, Ying Shan, Gang Zeng, Dahua Lin, Xihui Liu, Ziwei Liu
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024. **(Highlight, Top 2.8%)**
- **HyperHuman: Hyper-Realistic Human Generation with Latent Structural Diffusion**
Xian Liu, Jian Ren, Aliaksandr Siarohin, Ivan Skorokhodov, Yanyu Li, Dahua Lin, Xihui Liu, Ziwei Liu, Sergey Tulyakov
International Conference on Learning Representations (ICLR), 2024. **(Review Score 6, 6, 8, 10, Top 1.6%)**
- **Semantic-Aware Implicit Neural Audio-Driven Video Portrait Generation**
Xian Liu, Yinghao Xu, Qianyi Wu, Hang Zhou, Wayne Wu, Bolei Zhou
European Conference on Computer Vision (ECCV), 2022. **(Oral Presentation, Top 2.7%)**
- **Audio-Driven Co-Speech Gesture Video Generation**
Xian Liu, Qianyi Wu, Hang Zhou, Yuanqi Du, Wayne Wu, Dahua Lin, Ziwei Liu
Advances in Neural Information Processing Systems (NeurIPS), 2022. **(Spotlight Presentation, Top 5%)**

- **Learning Hierarchical Cross-Modal Association for Co-Speech Gesture Generation**
Xian Liu, Qianyi Wu, Hang Zhou, Yinghao Xu, Rui Qian, Xinyi Lin, Xiaowei Zhou, Wayne Wu, Bo Dai, Bolei Zhou
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2022.
- **Taming Diffusion Models for Audio-Driven Co-Speech Gesture Generation**
Xian Liu*, Lingting Zhu*, Xuanyu Liu, Rui Qian, Ziwei Liu, Lequan Yu
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2023.
- **Visual Sound Localization in the Wild by Cross-Modal Interference Erasing**
Xian Liu*, Rui Qian*, Hang Zhou*, Di Hu, Weiyao Lin, Ziwei Liu, Bolei Zhou, Xiaowei Zhou
AAAI Conference on Artificial Intelligence (**AAAI**), 2022.
- **HMAR: Efficient Hierarchical Masked AutoRegressive Image Generation**
Hermann Kumbong*, Xian Liu*, Tsung-Yi Lin, Xihui Liu, Ziwei Liu, Daniel Y. Fu, Ming-Yu Liu, Christopher Ré, David W. Romero
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2025.
- **TC4D: Trajectory-Conditioned Text-to-4D Generation**
Sherwin Bahmani*, Xian Liu*, Wang Yifan*, Ivan Skorokhodov, Victor Rong, Ziwei Liu, Xihui Liu, Jeong Joon Park, Sergey Tulyakov, Gordon Wetzstein, Andrea Tagliasacchi, David Lindell
European Conference on Computer Vision (**ECCV**), 2024.
- **3DTrajMaster: Mastering 3D Trajectory for Multi-Entity Motion in Video Generation**
Xiao Fu, Xian Liu, Xintao Wang, Sida Peng, Menghan Xia, Xiaoyu Shi, Ziyang Yuan, Pengfei Wan, Di Zhang, Dahua Lin
International Conference on Learning Representations (**ICLR**), 2025.
- **High-Quality Joint Image and Video Tokenization with Causal VAE**
Dawit Mureja Argaw, Xian Liu, Qinsheng Zhang, Joon Son Chung, Ming-Yu Liu, Fitsum Reda
International Conference on Learning Representations (**ICLR**), 2025.
- **TextCraftor: Your Text Encoder Can be Image Quality Controller**
Yanyu Li, Xian Liu, Anil Kag, Ju Hu, Yerlan Idelbayev, Dhritiman Sagar, Yanzhi Wang, Sergey Tulyakov, Jian Ren
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2024.
- **BrushNet: A Plug-and-Play Image Inpainting Model with Decomposed Dual-Branch Diffusion**
Xuan Ju, Xian Liu, Xintao Wang, Yuxuan Bian, Ying Shan, Qiang Xu
European Conference on Computer Vision (**ECCV**), 2024.
- **Object-Compositional Neural Implicit Surfaces**
Qianyi Wu, Xian Liu, Yuedong Chen, Kejie Li, Chuanxia Zheng, Jianfei Cai, Jianmin Zheng
European Conference on Computer Vision (**ECCV**), 2022.
- **Speculative Jacobi-Denoising Decoding for Accelerating Autoregressive Text-to-image Generation**
Yao Teng, Fu-Yun Wang, Xian Liu, Zhekai Chen, Han Shi, Yu Wang, Zhenguo Li, Weiyang Liu, Difan Zou, Xihui Liu
Advances in Neural Information Processing Systems (**NeurIPS**), 2025.
- **Accelerating Auto-regressive Text-to-Image Generation with Training-free Speculative Jacobi Decoding**
Yao Teng, Han Shi, Xian Liu, Xuefei Ning, Guohao Dai, Yu Wang, Zhenguo Li, Xihui Liu
International Conference on Learning Representations (**ICLR**), 2025.
- **T2V-CompBench: A Comprehensive Benchmark for Compositional Text-to-video Generation**
Kaiyue Sun, Kaiyi Huang, Xian Liu, Yue Wu, Zihan Xu, Zhenguo Li, Xihui Liu
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2025.
- **MonoHuman: Animatable Human Neural Field from Monocular Video**
Zhengming Yu, Wei Cheng, Xian Liu, Wayne Wu, Kwan-Yee Lin
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2023.
- **Semantics Meets Temporal Correspondence: Self-supervised Object-centric Learning in Videos**
Rui Qian, Shuangrui Ding, Xian Liu, Dahua Lin
International Conference on Computer Vision (**ICCV**), 2023.

- **Static and Dynamic Concepts for Self-supervised Video Representation Learning**
Rui Qian, Shuangrui Ding, Xian Liu, Dahua Lin
European Conference on Computer Vision (ECCV), 2022.
- **Motion Capture from Internet Videos**
Junting Dong, Qing Shuai, Yuanqing Zhang, Xian Liu, Xiaowei Zhou, Hujun Bao
European Conference on Computer Vision (ECCV), 2020. **(Oral Presentation, Top 2%)**
- **EdgeRunner: Auto-regressive Auto-encoder for Artistic Mesh Generation**
Jiaxiang Tang, Zhaoshuo Li, Zekun Hao, Xian Liu, Gang Zeng, Ming-Yu Liu, Qinsheng Zhang
International Conference on Learning Representations (ICLR), 2025.
- **MotionCraft: Crafting Whole-Body Motion with Plug-and-Play Multimodal Controls**
Yuxuan Bian, Ailing Zeng, Xuan Ju, Xian Liu, Zhaoyang Zhang, Wei Liu, Qiang Xu
AAAI Conference on Artificial Intelligence (AAAI), 2025.
- **E²GAN: Efficient Training of Efficient GANs for Image-to-Image Translation**
Yifan Gong, Zheng Zhan, Qing Jin, Yanyu Li, Yerlan Idelbayev, Xian Liu, Andrey Zharkov, Kfir Aberman, Sergey Tulyakov, Yanzhi Wang, Jian Ren
International Conference on Machine Learning (ICML), 2024.
- **Make-A-Volume: Leveraging Latent Diffusion Models for Cross-Modality 3D Brain MRI Synthesis**
Lingting Zhu, Zeyue Xue, Zhenchao Jin, Xian Liu, Jingzhen He, Xuanyu Liu, Ziwei Liu, Lequan Yu
Medical Image Computing and Computer Assisted Intervention (MICCAI), 2023.
- **DPoser-X: Diffusion Model as Robust 3D Whole-body Human Pose Prior**
Junzhe Lu, Jing Lin, Hongkun Dou, Ailing Zeng, Yue Deng, Xian Liu, Zhongang Cai, Lei Yang, Yulun Zhang, Haoqian Wang, Ziwei Liu
International Conference on Computer Vision (ICCV), 2025. **(Oral Presentation, Top 2%)**
- **Enhancing Self-supervised Video Representation Learning via Multi-level Feature Optimization**
Rui Qian, Yuxi Li, Huabin Liu, John See, Shuangrui Ding, Xian Liu, Dian Li, Weiyao Lin
International Conference on Computer Vision (ICCV), 2021.

JOURNAL PUBLICATIONS

- **ChemSpacE: Toward Steerable and Interpretable Chemical Space Exploration**
Yuanqi Du, Xian Liu, Shengchao Liu, Jieyu Zhang, Bolei Zhou
Transactions on Machine Learning Research (TMLR), 2023.

WORKSHOP PAPERS

- **Interpreting Molecular Space with Deep Generative Models**
Yuanqi Du, Xian Liu, Shengchao Liu, Jieyu Zhang, Bolei Zhou
ELLIS Machine Learning for Molecule Discovery Workshop, 2021. **(Oral Presentation)**
ICLR Machine Learning for Drug Discovery Workshop, 2022.

INTERNSHIP EXPERIENCE

- **Deep Imagination Research Group, NVIDIA Research** Santa Clara, United States
Research Scientist Intern. Supervisor: Ting-Chun Wang, Yogesh Balaji, Ming-Yu Liu Mar. 2024 - Jun. 2024
- **University of Toronto** Toronto, Canada
Visiting Student. Collaborator: Sherwin Bahmani, David B. Lindell Dec. 2023 - Mar. 2024
- **Tencent AI Laboratory** Shenzhen, China
Research Intern. Supervisor: Ying Shan, Xiaohang Zhan Sept. 2023 - Dec. 2023
- **Creative Vision Group, Snap Research** Los Angeles, United States
Research Intern. Supervisor: Sergey Tulyakov, Jian Ren, Aliaksandr Siarohin May. 2023 - Sept. 2023
- **Digital Content Group, Shanghai AI Laboratory** Shanghai, China
Research Intern. Supervisor: Hang Zhou, Wayne Wu Jul. 2021 - Feb. 2022
- **Intelligent Video Group, SenseTime Research** Shanghai, China
Research Intern. Supervisor: Qianyi Wu, Bo Dai Aug. 2020 - Jun. 2021

PROFESSIONAL SERVICES

- **Area Chair / Senior Program Committee:** AAAI.
- **Conference Program Committee / Reviewer:** CVPR, ECCV, ICCV, WACV, SIGGRAPH, SIGGRAPH Asia, NeurIPS, ICML, ICLR, AISTATS, AAAI, ACM MM.
- **Journal Reviewer:** TPAMI, IJCV, TVCG, TMM, EG, CGF, PG.

SELECTED HONORS & AWARDS

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| • CNET 2025 Best of CES, Best of AI, and Best Overall Award | 2025 |
| • ECCV Outstanding Reviewer Award | 2024 |
| • CVPR Travel Award | 2024 |
| • ICLR Travel Award | 2024 |
| • National Scholarship | 2019, 2020 |
| • Hong Kong Ph.D. Fellowship Scheme (HKPFS) | 2021-2025 |
| • Outstanding Graduate, Zhejiang Province | 2021 |
| • SenseTime Scholarship | 2020 |
| • Tang Lixin Scholarship | 2019 |
| • First Class Scholarship for Academic Excellence | 2019, 2020 |