Haolin Xiong

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EDUCATION

University of Southern California (USC) – Los Angeles, CA
Ph.D. in Computer Science *08/2025 – Expected 06/2030*

University of California, Los Angeles (UCLA) – Los Angeles, CA
M.S. in Electrical & Computer Engineering *09/2022 – 06/2024*

Rensselaer Polytechnic Institute (RPI) – Troy, NY
M.S. in Business Analytics *01/2021 – 12/2021*

B.S. in Computer & System Engineering *09/2017 – 12/2020*
Dual B.S. in Economics

RESEARCH EXPERIENCE

USC, Vision & Graphics Lab (VGL) – Supervisor: Assistant Prof. Yajie Zhao

Research Engineer *– 3D Computer Vision* *07/2024 – present*

- Conduct research on 3D Gaussian Splatting (3DGS) and neural rendering, focusing on scene understanding, physical modeling, and efficient representations for robotics, simulation, world models, and AR/VR applications.
- Develop novel 3D scene representation and learning methods for spatial reasoning, physically grounded scene interaction, and scalable neural rendering.
- Published research across efficient 3DGS, sparse-view reconstruction, neural avatar synthesis, and illumination-aware 3D scene modeling.

UCLA, Visual Machines Group (VMG) – Supervisor: Associate Prof. Achuta Kadambi

Graduate Researcher *– 3D Computer Vision* *01/2023 – 06/2024*

- Developed 3DGS methods for sparse-view novel-view synthesis and 3D reconstruction, addressing challenges from limited input observations.
- Introduced depth supervision and generative priors for sparse-view 3DGS, improving PSNR by **up to 18%** and **LPIPS by 30%**, achieving SOTA.

WORK EXPERIENCE

Meta, Reality Labs *02/2025 – 08/2025*

Machine Learning Engineer *– Computer Vision (Contract via DigitalFish)* *Los Angeles, CA*

- Designed ML modules for VR/AR camera pose estimation, improving pose **pass rate** by more than **40%** while reducing computation cost by **20%**.
- Productized 3DGS, NeRF, and video diffusion models to generate large-scale pseudo-ground-truth VR datasets for downstream ML tasks.
- Developed a 9-camera multi-sensor VR capture system for high-accuracy depth estimation, adapting and extending existing algorithms for next-generation Meta Quest hardware.

SRI International, Center for Vision Technologies *03/2024 – 06/2024*

Computer Vision Intern *– Neural Rendering and Gaussian Splatting* *Princeton, NJ*

- Developed a novel-view synthesis pipeline for an IARPA challenge across complex datasets with varying viewpoints, altitudes, and visual artifacts.
- Improved Structure-from-Motion (SFM) robustness using Multi-View Stereo techniques, robust feature detection, and bundle adjustment to reduce camera pose errors.

PUBLICATIONS

1. **Haolin Xiong**, Sairisheek Muttukuru, et al. "SparseGS: Sparse View Synthesis using 3D Gaussian Splatting". *3DV 2025*
2. Hanyuan Xiao, Yingshu Chen, Huajian Huang, **Haolin Xiong**, et al. "Localized Gaussian Splatting Editing with Contextual Awareness". *WACV 2025*
3. Shuang Song, Debao Huang, **Haolin Xiong**, et al. "Olbedo: An Albedo and Shading Aerial Dataset for Large-Scale Outdoor Environments". *CVPR 2026*
4. **Haolin Xiong**, Tianwen Fu, et al. "Mind-to-Face: Neural-Driven Photorealistic Avatar Synthesis via EEG Decoding". *ECCV 2026* ***(Spotlight)***
5. Gonglin Chen, Ben Southall, Hanyuan Xiao, Wenbin Teng, **Haolin Xiong**, et al. "XDG: Accelerated Visual Disambiguation". *WACV 2027*

UNDER REIVEW/ PREPRINT

6. **Haolin Xiong**, Xinlei Yu, et al. "Gaussian PCA-Tree: Analytic Hierarchy for 3D Gaussian Splatting Compaction".
7. Bryce Blinn, **Haolin Xiong**, et al. "Track-LIVO: Geometric Visual Constraints from Neural Point Tracking for LiDAR-Inertial-Visual Odometry".

KEY SKILLS

- 3D Vision & Graphics: 3DGS, NeRF, SfM/MVS, Ray Tracing, Rasterization, SLAM, Camera Calibration
- Tools: Maya, Blender, Adobe Creative Suite
- Programming & ML: Python, PyTorch, C++, CUDA
- Development: Linux, Git, Docker
- Agentic AI: Dify, RAG, MCP