Haolin Xiong

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EDUCATION

University of California, Los Angeles (UCLA) – Los Angeles, CA *09/2022 – 06/2024*
M.S. in Electrical & Computer Engineering (Current GPA: 3.9/4.0)

Rensselaer Polytechnic Institute (RPI) – Troy, NY
M.S. in Business Analytics (GPA: 3.93) *01/2021 – 12/2021*

B.S. in Computer & System Engineering (GPA: 3.6) *09/2017 – 12/2020*
Dual B.S. in Economics

RESEARCH EXPERIENCE

Researcher – 3D Computer Vision
***USC**, Vision & Graphics Lab (VGL) - Supervisor: Assistant Prof. Yajie Zhao* *07/2024 - Present*

- Conduct advanced research in various aspects of 3D Computer Vision, focusing on enhancing techniques for scene reconstruction, content generation, and spatial understanding.
- Lead a comprehensive survey on long-range Dynamic Occlusion, exploring depth perception improvements in VR/AR.
- Investigate diffusion models and Score-Distillation Sampling (SDS) for lighting-aware editing in 3D Gaussian Splatting (3DGS).

Graduate Researcher – 3D Computer Vision
***UCLA**, Visual Machine Group (VMG) - Supervisor: Assistant Prof. Achuta Kadambi* *01/2023 - 06/2024*

- Conduct research in Assistant Prof. Kadambi's Visual Machine Group, focusing on novel view synthesis and 3D reconstruction.
- Performed broad literature and post-implementation reviews in Neural Radiance Field (NeRF) and 3D Gaussian Splatting (3DGS).
- Developed original methods, such as incorporating depth loss and generative priors, to improve 3DGS performance in sparse-view settings for up to **18%** in PSNR, **30%** in LPIPS, and achieving **SOTA**.

Graduate Research Assistant – Neural Network/ Deep Learning
***RPI** - Supervisor: Prof. Meng Wang* *03/2021 - 09/2021*

- Assisted Prof. Meng Wang's Ph.D. group to develop a publication regarding theoretical perspectives of the *Lottery Ticket Hypothesis.* The paper has been published on NeurIPS 2019 **(arXiv: 2110.05667).**
- Reviewed literatures and research papers to learn, implement, and debug existing procedures of relevant algorithms.
- Designed 20+ experiments in Python to test the convergence and the stability of our newly developed weight pruning algorithm on MNIST/CIFAR-10 datasets, with Lenet-5 and Resnet-50 networks.

WORKING EXPERIENCE

Computer Vision Intern – Neural Rendering and Gaussian Splatting
***SRI International** – Supervisor: Supun Samarasekera* *03/2024 - 06/2024*

- Participate in developing a pipeline for novel view synthesis as part of an IARPA challenge, enhancing the system's ability to handle diverse datasets with varying complexities.
- Design and implement algorithms for datasets featuring different numbers of input views, variable altitudes, and artifact-injected inputs, improving the robustness and accuracy of the view synthesis process.
- Contribute to the development and optimization of existing Structure from Motion (SFM) components by utilizing advanced Multi-View Stereo (MVS) techniques such as Bundle Adjustment, significantly decreasing RMSE in pose estimation.

PUBLICATION

1. **Haolin Xiong**, Sairisheek Muttukuru, Hanyuan Xiao, Rishi Upadhyay, Pradyumna Chari, Achuta Kadambi. "SparseGS: Sparse View Synthesis using 3D Gaussian Splatting". **(arXiv: 2312.00206)**
2. Hanyuan Xiao, **Haolin Xiong**, Yingshu Chen, Huajian Huang, Jing yang, Pratusha Prasad, Yajie Zhao. "Localized Gaussian Splatting Editing with Contextual Awareness". Winter Conference on Applications of Computer Vision. (**arXiv: 2408.00083**)

KEY SKILLS

- Programming Language: Python, SQL, R, C++, C, CUDA
- Scientific Libraries: NumPy, Pandas, Matplotlib, etc.
- Environment Tools: Conda, Docker, GitHub
- Deep Learning Frameworks: PyTorch, TensorFlow
- Data/Statistic Tools: SQL, SSMS, R-studio, Tableau, PowerBI
- High exposure to Computer Vision related topics (e.g., NeRF, Generative Models, ViT, etc.)
- High exposure to NLP in behavioral research (e.g., Latent Space Transformation, Recommender System, etc.)
- Solid background in Math: Calculus, Linear Algebra, Statistics, Machine Learning & Deep Learning