

MORAN XU

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Summary

Applied Research Scientist and High-performance Software Engineer with **3+ years of R&D experience** specializing in **Computer Vision, Generative AI, and Multi-modal Understanding**. Proven expertise in architecting high-throughput **inference engines in C++ and Python**, bridging advanced machine learning research with enterprise-grade production software. Strong track record of cutting-edge research, including training advanced **neural rendering models for video synthesis, diffusion and GAN models for image generation and resolution enhancement**, alongside publishing 9 peer-reviewed papers and actively contributing to the academic community through peer review.

(Google Scholar: <https://scholar.google.com/citations?user=Pz5A2ZkAAAAJ&hl=en&oi=ao>)

Technical Skills

- **Generative AI & Core Vision:** Diffusion Models, Neural Radiance Fields (NeRF), 3D Gaussian Splatting (GS), Generative Adversarial Networks (GANs), Vision Transformers (ViT), Large Vision Models (LVM), Image/Video Synthesis.
- **Programming & Optimization:** Python (Expert), C/C++ (Production-level), CUDA, Low-level GPU Memory Management (Zero-copy, Dynamic Batching).
- **ML Frameworks & Systems:** PyTorch, TensorFlow, ONNX, Azure ML, Docker/Kubernetes, Distributed Computing, CI/CD.
- **Research Areas:** 3D Volumetric Reconstruction, Multi-modal AI, Computational Imaging, Image Restoration, Spatial Intelligence, Symbol Contrastive Learning.

Education

Washington University in St. Louis, St. Louis, MO 08/2021 - 01/2023
- Master of Science in Computer Science and Engineering (GPA: 4.0/4.0)

Work Experiences

Carl Zeiss, Inc. Dublin, CA 05/2023 - Present
Senior Algorithm Engineer

- **Generative AI & Scene Representation:** Trained and deployed **Gaussian Splatting (GS)** and **Neural Radiance Field (NeRF)** models utilizing the **Nerfstudio** framework. Directed applied research on dynamic scene representation by training GS models on complex automotive datasets (e.g., KITTI) to **advance 3D reconstruction, trajectory planning, and high-fidelity video generation**.
- **Vision Foundation Models:** Designed, pre-trained, and deployed a domain-specific **Large Vision Foundation Diffusion Model** for complex generative tasks and cross-material inspection. Successfully created a generalist framework that eliminated 80% of per-sample fine-tuning time while maintaining high-fidelity reconstruction capabilities.
- **Technology Transfer & High-Performance C++ Backend:** Architected a **high-throughput C++ inference engine** for 3D Spatial Intelligence reconstruction, implementing **zero-copy memory management** and **custom dynamic batching**. Optimized throughput by 2-4x, reduced VRAM overhead by 40% and enabled real-time processing of multi-gigabyte datasets.
- **Production Deployment:** Drove \$2M+ annual revenue by transferring advanced applied ML technologies into 10+ production solutions for Fortune 500 clients, reducing imaging acquisition time by 40% and improving reconstruction quality by 25%.
- **Developed automated model testing pipeline for volumetric imaging algorithms**, reducing testing cycles from 2 weeks to 3 days and eliminating 15 hours/week of manual work

Shengshi Science and Technology, Hangzhou, China 08/2020 - 05/2021
Algorithm Engineer

- **Medical Computer Vision:** Developed and optimized cardiovascular centerline extraction algorithms processing 500+ patient cases, reducing manual annotation time by 85% and achieving 90%+ accuracy

Research Experiences

Washington University in St. Louis, St. Louis, MO 08/2021 - 01/2023

- **Generative Modeling & Image Synthesis:** Developed WGAN-GP architectures for ill-posed image restoration and CT reconstruction tasks, achieving state-of-the-art performance on denoising, super-resolution, and missing-data regimes.
- **Model Optimization:** Designed deep autoencoder architectures for rateless information transmission and applied knowledge distillation strategies to optimize detection/classification models for resource-constrained environments.