Renjie Zhao

(206) 581-5662 renjiz2@outlook.com renjiz2.com linkedin.com/in/renjiz2

Education

University of Washington September 2023 – Expect June 2027
Bachelor of Science in Computer Science (Data Science option) *Seattle, WA*

Work Experience

University of Washington, RealityLab June 2025 – February 2026
Research Assistant
Renjie Zhao, Jingwei Ma, Huy Huynh, Brian Curless, Steven M. Seitz, Ira Kemelmacher-Shlizerman. "GarmentZoom: Generating Zoomable Images from Garment Listings", ECCV 2026 RetailVision Workshop. [Project Page] [arXiv]

- Led GarmentZoom as **first author**, developed reference-guided garment super-resolution across **3**×**–20**× zoom levels.
- Fine-tuned **FLUX.1-dev with LoRA** and joint reference–target token sequences, reducing perceptual error by **54%** at 10× zoom versus the strongest cross-attention variant tested.
- Built the data curation pipeline to form non-aligned training pairs.

University of Washington September 2026 – Present
Teaching Assistant | CSE 493G/599G: Deep Learning ; CSE 453/M553: Data Center Systems

- Course topics: virtualization, memory/storage systems, datacenter networking, hardware acceleration, machine learning system,deep learning, computer vision models, model architectures, reinforcement learning, test time training.
- Design and test Go/gRPC microservice projects using Docker, **Kubernetes**, and wrk2 for **133 students**.

Research Experience

UW RAIVN Lab & Allen Institute for AI (Ai2) February 2026 – Present
Student Researcher (Project Lead) | Improving Physical Realism in Video Generation Models through Reinforcement Learning

- Training a video diffusion model (**Wan-2.2 27B-A14B**) with large scale reinforcement learning to improve physical realism in generated videos.
- Optimized **16-GPU** (Nvidia H200 141GB) RL training, achieving **4**× **faster steps** than Flow-GRPO.
- Redesigned classifier-free guidance (CFG) for RL fine-tuning, reducing its incremental peak-memory overhead from **101 GB to 0.02 GB** and halving GPU requirements per rollout group (**8 to 4**).
- Designed novel data retrieval pipeline for large scale dataset curation.
- Developed an automated reward to consistently identify most physically plausible videos.

UW SysLab December 2024 – June 2025
Student Researcher | Power Adaptive Storage System with Zoned Storage Devices

- Modified **F2FS** File System in **Linux kernel** to utilize the predictable power profiles of zone-namespace storage devices.
- Stabilized IO performance with background garbage collection and data migration.

Projects

ML-TOMB: Multi-LoRA Training with One-Model Base [Report]
Renjie Zhao, Alek Curless

- Implemented a **CUDA kernel** for training multiple LoRA adapters on a shared base model.
- Achieved up to **2.63**× **speedup** for machine learning training.
- Proposed a novel framework to benchmark training speed.

SiriTok - Semantically Rich 1D Tokenizer [Poster]
Renjie Zhao

- A one-dimensional image tokenizer for latent diffusion models while preserving both textural details and semantic information.
- Achieved **79%** linear probing classification accuracy on ImageNet from our latent space.
- Proposed a novel **semantic preservation loss**.
- Fine-tuned a pretrained semantic encoding model (**DINOv3**) with 8-GPU (Nvidia A40 48GB) **FSDP**.

Skills

Languages: Python, C/C++, CUDA, Java, C#, JavaScript, SQL, GoLang
ML / Systems: PyTorch, MuJoCo, Isaac Sim, einops, NumPy
Areas: Computer Vision, Machine Learning, ML Systems, Reinforcement Learning, Distributed Systems, AI-assisted Coding (Claude Code, Codex)