

Zizhao Hu

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SKILLS

- Research expertise in **Vision Architecture, Multimodal Learning, Continual Learning, VLM, LLM**
- Programming Language: **Python, Java, C++, C, Javascript, SQL, English (LLMs)**
- Developer Tools: **PyTorch, TensorFlow, Git, SLURM, GNU/Linux**
- Familiar Open-source Foundation Models: **Stable Diffusion, Llama, Qwen, DeepSeek, InternVL, LLaVA**

EDUCATION

University of Southern California

- Ph.D. candidate in Computer Science August 2022 - Present
- Master of Science in Computer Science August 2020 - May 2022
- Key courses/concepts: **Machine Learning, Artificial Intelligence, Computer Vision, Natural Language Processing, Reinforcement Learning, Online Optimization**

Georgia Institute of Technology

August 2016 - May 2020

- Bachelor of Science in Physics, Highest Honor
- Key courses/concepts: **Statistical Mechanics, Thermodynamics, Quantum Computing, Photonics**

PROFESSIONAL EXPERIENCE

USC Information Science Institute | Researcher

February 2022 - Present

- Optimized **Neural Architectures** such as **ViTs, VAEs, CNNs, and MLP-Mixers** for **Vision** and **Vision-Language** tasks. Improved state-of-the-art performance by up to 10% and efficiency by up to 40% for image classification, generation, and vision-language alignment benchmarks. (See my Google Scholar page for publication details)
- Improved **Language grounding** in multimodal architectures such as text-to-image **Diffusion backbones**, and open-source **Vision-Language Models**. Achieved >10% preference margin on existing alignment benchmarks.

USC iLab | Researcher

February 2021 - February 2022

- Developed new **Reinforcement Learning** algorithms for safe AI agents in real-time environments.
- Designed new **Genetic Algorithms** for AI agents to learn the physics of the test-time environments.

Georgia Tech Nanophotonics Laboratory | Research Assistant

August 2019 - August 2020

- Designed **Autoencoders** to reverse-design nanomaterials (metasurfaces).
- Achieved human-expert-level design quality with 10000× speedup.

Georgia Tech Agile System Lab | Research Assistant

August 2017 - August 2018

- Conducted wind tunnel testing and data analysis on the flight profile of Hawk Moth.
- Streamlined experimental data analysis pipelines, and reduced data processing time from 6 hours to 2 minutes.

FEATURED PUBLICATIONS

- Static Key Attention in Vision (2024)
- Lateralization MLP: A Simple Brain-inspired Architecture for Diffusion (2024)
- Intermediate Adapter: Efficient Alignment of Text in Diffusion Models (2024)
- Self-augmenting Adversarial GPTs: Boosting Customized Text Generation (2023)
- GalilAI: Out-of-Task Distribution Detection using Causal Active Experimentation for Safe Transfer RL (2022)
- Rapid frequency modulation in a resonant system: aerial perturbation recovery in hawkmoths (2022)

LEADERSHIP, FEATURED AWARDS, AND SERVICE

Project Supervisor & Mentors at Georgia Tech & University of Southern California

- Supervised **1000+** graduate students on Deep Learning projects in computer Vision, NLP, etc.
- Mentored **10+ junior researchers** on AI publications in Computer Vision, NLP, etc.

Joyce M. and Glenn A. Burdick Prize (2018)

- Awarded to the student who demonstrated scholastic achievement and leadership at Georgia Tech

Olympiads

- 2 golds at the 27th & 28th Chinese Mathematics Olympiads

Conference Reviewers

- NeurIPS (2024), ICML (2025), ICLR (2025)