

Amy Liu

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Driven student researcher & developer in computer graphics (CG). Interested in roles within 3D content creation pipelines akin to Internal Tools Engineer and R&D Engineer. Enjoys GPU optimization research & low-level parallel systems architecture development.

EDUCATION

University Of Pennsylvania Aug 2021 - May 2026

BSE in **Digital Media Design** (Computer Graphics)

MSE in **Computer Graphics and Game Technology**

Relevant Coursework:

GPU Programming, Procedural Computer Graphics, Interactive Computer Graphics, Advanced Rendering, Computer Animation, Game Design Practicum, Data Structures & Algorithms, Linear Algebra, Multi-variable Calculus, Advanced 3D-Modeling

Activities:

- 2023-24 Social VP | Penn CG Student Chapter (SIGGRAPH)
- 2022-26 Member | Penn Lions (Chinese Lion Dance team)

EXPERIENCE

3D Tools and Graphics R&D Intern Jul 2024 - Dec 2024

GliaCloud Co., Ltd.

📍 Taipei City, Taiwan

- Developed company's pilot project in 3D software – "Omniverse ComfyUI Bridge" ¹ – with a team of 4 engineers.
- Contributed original benchmark data to NVIDIA NIM Services research for NVIDIA Startup Inception program collaboration.
- Built an internal plug-in to standardize scene import of OpenUSD (Universal Scene Description) 3D assets.
- Deployed USD Search API onto company infrastructure via cloud-hosted Kubernetes clusters. Gathered performance statistics + workload analyses of 3D deepsearch microservices.
- Wrote 5+ custom HLSL Reshade (post-process) shaders.

Computer Graphics Research Intern May 2022 - Jan 2023

Sponsored by the National Science Foundation

📍 ICT Vision & Graphics Lab

Los Angeles, CA

- Developed a standalone Python API service that instantaneously generates physically-accurate, 3D-modeled face accessories (glasses, hats, masks) onto input scanned human face mesh of arbitrary gender, race, & age.
 - Photo-realism in final rendered outputs qualified as training data for next-gen facial visualization machine learning models.
 - Presented in 2022 National Science Foundation Symposium.
- Briefed 50+ participants for lab's state-of-the-art Light Stage digitalization research. Fully trained in Light Stage 6 control.

Web Software Engineer Jan 2022 - Dec 2024

Penn Labs

📍 Philadelphia, PA

- React developer for web services used by the entire UPenn student body – Schedule Planning (5K+ users), Course Reviews (9K+ users), & Enrollment Alerts (3K+ users).
- Integrated a social-networking feature for real-time schedule sharing – successful usage by 4K+ students in 2024.
- Collaborate daily with backend software engineers, devops, designers, & business devs. Conduct code reviews, maintain 726-file codebase, & facilitate organization recruitment.

PERSONAL PROJECTS

glRemix ¹ [C++ | Direct3D12 | OpenGL]

2025

A standalone plug-and-play platform to remaster decades-old, 32-bit, fixed-pipeline OpenGL games using modern real-time Windows Direct3D 12 raytraced lighting techniques.

- Developed event-based, double-buffered Inter-Process Communication system to transfer 32-bit aligned data from original game loop to a host 64-bit D3D12 renderer.
- **Achievements:** O(n) data transfer / memory copy on the CPU. Compatible with all OpenGL 1.x games, with or without source code. Notably, brought raytracing to Valve's Half Life (1998).

Neural for USD ¹ [C++ | USD | PyTorch] 2025

A C++ plugin for OpenUSD, supporting arbitrary USD scenes, real-time artist editing, & multi-view render captures for use in NeRF training and novel view synthesis.

- Custom USD Hydra Render Engine built on QT OpenGL.
- Unix-friendly PyTorch-based NeRF deep-learning model.

Omniverse ComfyUI Bridge ¹ [USD | Python] 2024

A connector between ComfyUI & all applications built on the Omniverse Kit, enabling real-time access to the USD-based viewport AOV data within all ComfyUI Gen AI workflows.

RESEARCH CONTRIBUTIONS

"MoBi-LE - A Low-Cost 3D-printable Robot to Educate Children in Waste Disposal" 2024

Published in *Assoc. for Computing Machinery Digital Library*
Investigated robotics & 3D-printing as tools for teaching decision-making & inspiring tech innovation in K-12 educational environments.

"The Fictive Mosaics of Medieval Serbia" 2022

Published in *The University of Chicago Press Journals*
Developed custom texturing, compositing, & lighting techniques in Adobe Photoshop to improve efficiency & accuracy in anthropological 3D reconstruction.

SKILLS

General:

C++/C#, Typescript, Python, SQL

Computer Graphics / 3D-Modeling:

Languages/APIs: CUDA, WebGPU, OpenUSD, Vulkan, HLSL

Tools: Unreal, Maya, Houdini, Unity, Blender, Adobe Substance 3D

Misc:

Server Hosting (Perforce Administration), Cloud Infrastructure (GCP, AWS S3, Azure), Linux Shell Scripting (Bash/Vim), CI/CD (Husky, GitHub Actions), Container Tools (Kubernetes + Helm, Docker), Python Virtual Environments (Pyenv, Conda), Git