

ALDEN WU

+1 (408) 832-8816 | contact@aldw.net | aldw.net | github.com/goodtrailer | updated October 23, 2026

EDUCATION

University of California, San Diego

Computer Science M.S. (Depth: Graphics & Vision), GPA 4.0

Computer Science B.S. & Mathematics B.S., GPA 3.92

San Diego, CA

Sep 2025 – Jun 2027

Sep 2022 – Jun 2026

EXPERIENCE

UC San Diego – Computer Graphics Researcher (Student) | *Python, PyTorch, CUDA, ROCm*

Mar 2026 – Sep 2026

- Investigated mechanistic algorithms based on AI diffusion models for 2D & 3D content generation
- Engineered asymptotic performance improvements—observing up to 262,000x speedups in practice—by adapting efficient 2D image algorithms (e.g. PatchMatch) to 3D voxel domains plus GPU acceleration
- Explored efficient representations for 3D geometry: implicit surfaces, NeRFs, point clouds, etc.

Amazon – Software Engineer Intern | *Linux, Android, C++, Python, AWS, LLM, WebDriver*

Jun 2025 – Sep 2025

- Worked on an agentic AI/LLM-based automation framework for facilitating CI/CD on Kindle device
- Reduced cost 5.5x and sped up execution time 7x for navigation, keypresses, and other essential capabilities
- Improved stability of device-side daemon by debugging and fixing memory buffer management
- Collaborated in Agile workflows with Jira, participating in sprint planning, cross-team meetings, code reviews

Marvell – Software Engineer Intern | *PHP, HTML/CSS, JavaScript, Subversion, XAMPP*

Jun 2024 – Sep 2024

- Refactored and simplified large portions of code to improve maintainability, reducing bloat and repetition
- Used MySQL to display more detailed and useful information to end users

PROJECTS

Path tracer, 3D renderer – aldw.net/projects#pbr | *C++, NVIDIA OptiX, CUDA, CMake*

Jan 2025 – Feb 2025

- Physically based Monte-Carlo ray tracer, GPU accelerated with NVIDIA OptiX
- Implemented the Smith-GGX microfacet model for reflection and transmission, with intuitive material parameters
- Accelerated convergence with photon mapping, BSDF importance sampling, next event estimation, MIS
- Supported numerous output color spaces (Linear, sRGB, CIEXYZ, Rec. 2020) and HDR

Physics/geometry simulations – aldw.net/projects#physics | *C++, Houdini, NumPy, SciPy*

Jan 2024 – Jun 2024

- Derived and implemented the equations of motion for a triple pendulum using Lagrangian mechanics
- Developed numerical integrators for nonlinear systems modeling complex multi-body dynamics
- Simulated 2D fluids using vortex methods, applying Kelvin’s circulation theorem and a discretized Biot-Savart law
- Computed geodesic distances in curved geometry by integrating heat flows (heat method)

AR/VR application – “AILA” | *C#, .NET, Unity, Blender, OpenXR, Meta Quest 2*

Apr 2024 – Jun 2024

- Delivered intuitive UX by experimenting with many interaction modes: raycasts, go-go hands, WIM
- Improved accessibility by implementing multiple travel methods: teleportation, joystick, skiing

Video game – “osu!” (Open-Source, 19.2k stars) | *C#, .NET, OpenGL, SDL2, NUnit, RenderDoc*

Jul 2022 – Feb 2023

github.com/pppy/osu, github.com/pppy/osu-framework

13 PRs, 74 commits

- Contributed 13 PRs to a project with 38M+ users, navigating strict maintainer review and quality standards
- Optimized performance by debugging with RenderDoc, reducing poly-counts by ~15% for “sliders”

COURSEWORK

CSE Graphics, Rendering (PBR), Animation, Physics Simulation, Virtual Reality, Image Processing, Differentiable Programming, Computer Vision, Robotics, Embedded Systems (FPGA), Parallel Programming, Operating Systems, Computer Architecture

MATH Differential Geometry (& DDG), Fourier Analysis, Numerical Analysis, Linear Algebra, Vector Calculus, Probability, Computational Stochastics, Real Analysis, Functional Analysis, Groups, Rings, Fields, Graph Theory, Algebraic Topology

TECHNICAL SKILLS

Languages C/C++, GLSL, HLSL, C#, Java, Python, MATLAB, JavaScript, HTML/CSS, PHP, PostgreSQL

Frameworks CUDA, ROCm, PyTorch, OpenCV, OpenGL, Vulkan, Unreal Engine, Unity, Win32, .NET, NumPy, SciPy

Developer tools Linux, git, ssh, gdb, Claude Code, Codex, AWS, NVIDIA Nsight, CMake, vcpkg, Blender, Houdini