Alden Wu

+1 (408) 832-8816 | aldenwu18@gmail.com | aldw.net | github.com/goodtrailer | updated April 9, 2025

Education

University of California, San Diego — San Diego, CA
Computer Science & Pure Mathematics B.S., GPA 3.96 — *September 2022 – June 2026*

Experience

Software Engineer (Intern) – Amazon | *who knows?* — June 2025 – September 2025
- Incoming!

Software Engineer (Intern) – Marvell | *PHP, HTML/CSS, JavaScript, Subversion, XAMPP* — June 2024 – September 2024
- Refactored and simplified large portions of code to improve maintainability, reducing bloat and repetition
- Implemented a new style/structure for web pages, while keeping compatibility with old browsers/tools (e.g. PDF generation)
- Collaborated with other team members to make transition to new style/structure seamless and painless
- Used MySQL to display more detailed and useful information to end users

Coursework

CSE Data Structures, Algorithms, Software Engineering (OOP), Operating Systems, Networked Services, Computability, Cryptography, Optimization (ML), Differentiable Programming, Computer Vision, Virtual Reality (XR HCI), Computer Graphics, Computer Animation, Rendering (PBR), Discrete Differential Geometry, Physics Simulation

Math Linear Algebra, Vector Calculus, Differential Equations, Probability & Statistics, Abstract Algebra, Computational Stochastics, Graph Theory, Logic, Real Analysis, Fourier Analysis, Numerical Analysis, Topology

Technical Skills

Languages C#, Java, C/C++, Python, JavaScript, HTML/CSS, PHP, PostgreSQL, MongoDB, MATLAB, ARM Assembly
Frameworks Unreal Engine, Unity, React.js, Express.js, Win32, JUnit, GoogleTest, doctest, NUnit
Developer Tools git, ssh, gdb, AWS, Oracle Cloud, NVIDIA Nsight, CMake, vcpkg, NuGet, Maven, Linux, Apache HTTP
Libraries/etc. .NET, OpenGL, CUDA, NVIDIA OptiX, Node.js, Passport.js, PyTorch, OpenCV, NumPy, SciPy

Projects

Path tracer – "Moth" | *C++, NVIDIA OptiX, CUDA, CMake* — March 2024 – June 2024
- Programmed a physically based Monte-Carlo ray tracer, GPU accelerated with NVIDIA OptiX
- Implemented the Smith-GGX microfacet model for reflection and transmission, based on [Walter et al. 2007]
- Improved performance with BSDF importance sampling and next event estimation (MIS)
- Rendered sharper caustics with photon mapping, based on [Jensen 2001]

Study website – "rote" | *TypeScript, HTML/CSS, PostgreSQL, Node.js, React, Oracle Cloud* — August 2023 – September 2023
- Built a full-stack web application for creating, studying, and sharing flashcards
- Implemented a React front-end communicating with a Node.js/Express.js back-end via REST API
- Strengthened authentication security using password hashing, HTTPS (SSL/TLS) encrypted cookies, and CORS
- Designed a scalable database schema in PostgreSQL

Audio capture tool – "obs-app-audio" | *C++, Win32 API, CMake/Make, gdb, Audacity* — December 2020 – October 2021
- Facilitated low latency (~50µs) IPC by coding a lightweight library for Win32 pipes
- Performed real-time audio processing from concurrent sources using efficient data structures (e.g. ring buffer)
- Created a DLL injector to hook application APIs and intercept audio data

Open-Source Contributions

Rhythm game – "osu!" | *C#, OpenGL, SDL, NUnit, RenderDoc, .NET* — July 2022 – February 2023
github.com/ppy/osu, github.com/ppy/osu-framework — *13 PRs merged, 74 commits*
- Collaborated and contributed to a large open-source project
- Implemented various real-time graphical effects, e.g. interactive "smoke trails" and more accurate animations
- Optimized performance by reducing polygon counts by ~15% for certain objects