ALDEN WU

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EDUCATION

University of California, San Diego — San Diego, CA
Computer Science M.S. (Specialization: Graphics & Vision) — *Sep 2026 – Jun 2027*

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

EXPERIENCE

Amazon – Software Engineer (Intern) | *C++, Python, AWS, LLMs (Bedrock), WebDriver* — Jun 2025 – Sep 2025
- Worked on LLM-based automation framework for Kindle device to facilitate CI/CD
- Increased performance by 7x for common actions (e.g. navigation, text input) by adding new capabilities to the action model
- Decreased cost by 5.5x for common actions by optimizing LLM interaction logic
- Improved stability of on-device daemon by fixing memory buffer management

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
- Coordinated with other team members to make transition to new 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, PL/Compilers, Parallel Programming, Computer Vision, Virtual Reality, Computer Graphics, Animation, Rendering (PBR), Discrete Differential Geometry, Physics Simulation

MATH Linear Algebra, Vector Calculus, Probability, Abstract Algebra, Logic, Graph Theory, Computational Stochastics, Numerical Analysis, Real Analysis, Functional Analysis, Fourier Analysis, Lie Groups, Algebraic Topology

PROJECTS

Path tracer, 3D renderer – Sample images | *C++, NVIDIA OptiX, CUDA, CMake* — Mar 2024 – Jun 2024
- Physically based Monte-Carlo ray tracer, GPU accelerated with NVIDIA OptiX
- Implemented the Smith-GGX microfacet model for reflection and transmission
- Improved performance with BSDF importance sampling and next event estimation (MIS)
- Volumetric rendering of chromatic heterogeneous media (e.g. colored smoke)

Study website – github.com/goodtrailer/rote | *TypeScript, HTML/CSS, SQL* — Aug 2023 – Sep 2023
- Developed a React front-end with a Node.js/Express back-end, comunicating 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 – github.com/goodtrailer/obs-app-audio | *C++, Win32, WASAPI, gdb, Audacity* — Dec 2020 – Oct 2021
- Facilitated low latency (~50μs) IPC by coding a lightweight library for Win32 pipes
- Performed real-time audio processing on parallel sources with multithreading and efficient data structures (e.g. ring buffer)
- Created a DLL injector to hook application APIs and intercept audio data

OPEN-SOURCE CONTRIBUTIONS

Rhythm game & framework – "osu!" (17.8k stars) | *C#, OpenGL, SDL, NUnit, RenderDoc, .NET* — Jul 2022 – Feb 2023
github.com/ppy/osu, github.com/ppy/osu-framework — *13 PRs merged, 74 commits*
- Implemented several real-time graphical effects, e.g. interactive "smoke trail" animations
- Optimized performance by reducing polygon counts by ~15% for "slider" objects

TECHNICAL SKILLS

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