

# ALDEN WU

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## EDUCATION

### University of California, San Diego

Computer Science & Pure Mathematics B.S., GPA 3.96

San Diego, CA

September 2022 – June 2026

## EXPERIENCE

### Amazon – Software Engineer (Intern) | C++, Python, AWS, LLMs (Bedrock), WebDriver

June 2025 – September 2025

- Worked on LLM-powered action model and automation framework for Kindle device
- 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 improving efficiency of LLM interaction logic
- Improved stability of on-device daemon by fixing several bugs related to memory buffer management

### Marvell – Software Engineer (Intern) | PHP, HTML/CSS, JavaScript, Subversion, XAMPP

June 2024 – September 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, 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

## 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, NVIDIA OptiX, Node.js, Passport.js, PyTorch, OpenCV, NumPy, SciPy

## PROJECTS

### Path tracer, 3D renderer – “Moth” | C++, NVIDIA OptiX, CUDA, CMake

January 2025 – February 2025

- Programmed a physically based Monte-Carlo ray tracer, GPU accelerated with 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 – “rote” | TypeScript, HTML/CSS, PostgreSQL, Node.js, React, Oracle Cloud

August 2023 – September 2023

- 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/pppyosu](https://github.com/pppyosu), [github.com/pppyosu-framework](https://github.com/pppyosu-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 (“sliders”)