

Phoenix Ada Rose Mandala

📍 Lawrence, KS ✉ phoenix.mandala@pm.me 🌐 cubething.dev [in ada-mandala](#) 🔊 [ada-x64](#)

Professional Summary

Senior software engineer specializing in systems, developer tooling, and reliable agent infrastructure. Mainly writes in Rust, Python, and Typescript. Experienced designing cross-platform build systems and shipping production software from systems foundations and embedded platforms to the web stack and data infrastructure. Skilled at turning ambiguous research and integration problems into reliable, well-documented systems.

Experience

Build Systems Engineer

Microsoft Research / Nanvix

March 2026 -- Present

Python, CI/CD, Rust, Systems Engineering, AI

- Designed and developed [zutils](#), a cross-platform Python build SDK that replaced repository-specific scripts with standardized interfaces for dependency resolution, Docker-based cross-compilation, testing, and release packaging across 17 repositories.
- Ported and validated CPython and major C/C++ libraries—including OpenSSL, libffi, SQLite, and xz—for Nanvix’s lightweight microVM environment, addressing ABI, syscall, toolchain, and Linux/Windows host compatibility.
- Expanded CPython regression coverage and implemented POSIX/VFS fixes for path resolution, file timestamps, rename semantics, vectored I/O, FAT32, and HostFS; also built reusable GitHub Actions workflows for secure CI, releases, dependency updates, and cross-platform artifacts.
- Developed these systems through a human-in-the-loop agent workflow whose iterative prompt-distillation process produced d3r and several task-specific harnesses

Software Engineer

OpenSesame

January -- February 2025

TypeScript, Graphics APIs

- Built a SCORM-compatible browser application in framework-free TypeScript and Bun to test upcoming cookie and privacy restrictions.
- Created a SCORM emulation layer, Playwright end-to-end suite, and canvas animation from Figma designs; delivered ahead of schedule and under budget.

Software Engineer

Prospective

June 2023 -- June 2024

Rust, WASM, TypeScript, Python, CI/CD

- Owned the front end of Perspective, an open-source data-visualization platform, while contributing to its C++/Rust engine, Python library, network protocols, and enterprise dashboard.
- Designed its open-source plugin API and reactive architecture using custom elements and centralized state; documented its gRPC-based networking model.
- Improved engine performance and delivered Kerberos and Kafka integrations that helped secure the product’s first enterprise customer; product and research work also drove white-label adoption and increased website traffic.

Software Engineer

Valorem Reply / Disney+

June 2022 -- May 2023

Rust, WASM, Python, Embedded

- Assigned to a contract working with Disney+ to bring ESPN+ to the PS5 late in the production lifecycle. The project used a bespoke Rust front-end framework to develop on embedded devices and Linux-based OSs.
- Documented processes and tutored colleagues on idiomatic Rust usage. Developed concurrent algorithms to efficiently track and send analytics; integrated the video player based on Figma mockups; developed Python scripts to streamline cross-platform deployment to PS5 development kits.
- Joined a project that was stalled and over budget; unblocked the team on Rust and developed a clear production strategy, shipping the final build within 6 months. Recognized by the Disney-side project lead and invited to present findings to the engineering department.

Front-End Engineer

Roll20

October 2019 -- August 2021

JavaScript, SCSS, HTML5, Node.js

- Assigned development of the Charactermancer, a new front-end system intended to automate character sheet creation for TTRPGs. Worked on an original IP called [BurnBryte](#).
- Followed design specs to implement the Charactermancer using an Express server integrated with SCSS and PUG. Integrated with the Roll20 API to populate fields. Developed a [web scraper](#) to automatically replicate API data for local development.

Selected Personal Projects

d3r -- Agent Harness Build System

April 2026 -- Present

 [GitHub](#)

TypeScript, Zod, Vitest, LLM Agents, RAG, CI/CD

- Built a compiler that turns one harness-agnostic, zod-validated workflow definition into harness-specific prompts, tool mappings, and extensions, so system prompts are build artifacts with a single source of truth rather than hand-maintained prose.
- Partitioned agent context by role: routing agents read the workflow contract, while single-input agents are denied it, since context beyond an agent's inputs invites scope drift.
- Designed a git-backed document vault with 14 typed document kinds, a schema linter that validates every document's frontmatter, and a typed tool registry (frontmatter, vault CRUD and search, Exa-backed web search) reached through path guards and a CWD-scoped access gate.
- Audited real-use session transcripts against the orchestrator's declared contract to catalogue behavioral deviations, then moved enforcement out of prompts and into code once more prose failed to produce determinism.

cubething-qproj - Game dev ecosystem

January 2025 -- Present

 [GitHub Organization](#)  [Dev Log](#)

Rust, Bevy, ECS, Python, Nix, GitHub Actions

- Developing Quell alongside reusable Bevy crates for ANSI terminal emulation, screen and entity lifecycle management, and deterministic ECS application testing.
- Designed a modular, plugin-oriented architecture spanning input, UI, player state, developer tooling, and world-generation services.
- Built shared cross-repository infrastructure using Python, Nix, Cargo, and GitHub Actions to automate project setup, configuration synchronization, builds, tests, linting, coverage, and local or remote execution.

Education

University of Kansas

Aug 2014 -- Dec 2017

BA Philosophy (Hnrs.), BA Mathematics

3.8 GPA

- Coursework:** Computational Theory, Philosophy of Mathematics, Formal Logic, Honors Thesis
- Awards:** Paretsky Award for Creativity; Warner Morse Scholarship (for excellence in philosophy)

Selected Technologies

Programming Languages

Rust, JavaScript (TypeScript, Node.js, Bun, Deno), Python, C, C++, C#, PHP

LLMs / AI

Anthropic API, OpenAI API, RAG, Prompt Distillation, Adversarial Testing, Sandboxing

Cloud Technologies

Digital Ocean, Netlify, Microsoft Azure, AWS

Front-End / Client-Side

WASM (Rust), Reactive Frameworks, Browser APIs, Lit, Backbone, Underscore, jQuery

SysAdmin, Build Engineering, CI/CD

GitHub Actions, Docker, zsh, pwsh, Linux SysAdmin, WSL2

Back-End / Server-Side

Fastify, Express.js, PostgreSQL, Nginx, Server-Side Rendering, MySQL, Tower HTTP, SQLx, Axum

GPU

WebGPU, OpenGL, GLSL, HLSL, RenderDoc, Vulkan, three.js

Formal Methods and Research

TLA⁺, Coq, Lean, Typst, LaTeX, pandoc