Thomas Davis

Full Stack Developer & AI Engineer

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Software engineer with 20+ years building products at startups and in open source: founder of JSON Resume, co-founder of cdnjs. These days I build agentic systems end to end: tool-calling copilots with LLM-as-judge gates, autonomous document pipelines on the Claude Agent SDK, a bitemporal knowledge system in Rust with Lean-verified invariants, and neural TTS/ASR for Aboriginal language revitalization. I also wrote a dependently typed language whose compiler emits NVIDIA GPU code directly, and trained a 1.38B-parameter model with it on two H100s, with no CUDA or PyTorch. I ship fast and let user feedback steer.

Experience

Principal Engineer — AI (contract) 5 May 2021 – Present
Independent (contract & advisory) · Melbourne

Principal-level contract engineering, most recently owning the AI capability of an HR-tech SaaS end to end: the agentic layer of the product — an in-app copilot with tool-calling over live customer data, autonomous document-generation pipelines, and the server-side compute services underneath — while shipping across the full stack (PHP/GraphQL, React, Go gateway, edge services).

- Built an in-app AI copilot: multi-provider tool-calling agent (Anthropic + OpenAI via Vercel AI SDK) with data-query and mutation tools, an LLM-as-judge quality gate scoring every response on 8 dimensions, and SSE keep-alive for long agent streams
- Designed an autonomous report pipeline — one model plans the document, Claude Agent SDK runs write it against live data, a second agent pass compiles branded slide decks via a 90+ layout PPTX compiler with chart rasterization and LaTeX PDF output, agents running in a parallel containerized fleet
- Moved heavy analytics server-side (Bun + Hono behind a Go gateway): pure-function ports oracle-verified for numeric parity with the client engine, event-keyed Redis caching, validated at 20k+ entity scale
- AI data enrichment: ingested a ~32-table public occupational dataset, LLM-classified it into customer data structures, and built persona-driven simulation commands generating realistic test data at scale
- Shipped a standalone real-time collaborative app on Cloudflare Workers + Durable Objects — WebSocket presence, optimistic updates with server reconciliation, embedded AI assistant with client-side tool execution
- Hunted down multi-user concurrent-edit data loss with a purpose-built integrity harness: truly-parallel mutation racing, event-chain fork detection, contract tests driving real client reducers against the live API

Founder 1 Apr 2014 – Present
JSON Resume

JSON Resume is the open standard for resumes as JSON. I founded it in 2014 and still run it. What started as a schema is now an ecosystem: jsonresume.org renders any resume in 52 themes at jsonresume.org/@username, matches it against live Hacker News hiring posts with AI, and connects it to agents and HR tools. The whole thing lives in one open source monorepo.

- 7,000+ GitHub stars across the project's repos; tens of thousands of users

- Built AI job matching: embedding-based retrieval against live Hacker News hiring posts, hybrid retrieval and LLM reranking, with a gold-set eval harness that lifted precision at 5 from 0.2 to 0.8
- Rebuilt jsonresume.org in 2026 on a self-hosted Effect, React and Postgres stack: accounts, an in-browser editor that writes back to GitHub gists, and an OAuth 2.1 / OpenID Connect provider so HR tools can offer "Sign in with JSON Resume"
- An MCP server with a tool for every feature, so ChatGPT, Claude and other agents can manage a resume end to end
- 52 first-party themes rendered server-side, with render and section-coverage CI gates on every one
- Maintain the published packages: @jsonresume/schema, resume-cli, @jsonresume/jobs, @jsonresume/core, json-resume-serde (Rust)

Co-Founder 8 Jan 2011 – Present
cdnjs

Following Google's CDN for jQuery, we started a CDN for the less popular JavaScript and CSS libraries: community moderated and open source on GitHub. We secured the partnership with Cloudflare, which now runs its infrastructure.

- Serves hundreds of billions of requests a month, and millions of sites use it in production
- A larger market share than Yahoo's, Microsoft's and Google's JavaScript CDNs
- 3,000+ popular libraries; millions of developers visit the site each year; 10,000+ GitHub stars

Senior Javascript Developer 5 May 2020 – 5 May 2021
Tokenized · Melbourne

Built the frontend of an Electron-based Bitcoin wallet for issuing, managing, and trading digital tokens.

- Developed React and Redux interfaces for secure wallet operations.
- Implemented local key-management and transaction-signing workflows, keeping private keys on the user's device.

Senior JavaScript Developer, then Tech Lead 1 Mar 2018 – 1 Jan 2020
Blockbid · Melbourne

Australian cryptocurrency exchange. I started on the frontend and became tech lead, working on every moving piece of the exchange; I especially enjoyed connecting liquidity providers' platforms to give us liquid markets.

- Built trading interfaces and exchange services using React, Apollo, Node.js, and Rails.
- Integrated liquidity providers and optimized SQL queries across tens of millions of market records.
- Worked across infrastructure, product design, and deployment on Docker, Heroku, and GCP.

Developer 1 Jan 2016 – 1 Jan 2018
Listium

Developed a cross-platform React/Redux application for web, iOS, and Android using a shared application architecture.

- Built a PWA with React Native wrappers for mobile platforms.
- Worked with PostgreSQL, Redis, DynamoDB, AWS, Heroku, Fastly, and Cloudflare.

Developer 1 Apr 2014 – 1 Jan 2016
Electronic Frontier Foundation

Developed digital campaigning infrastructure and civic participation tools.

- Built a Ruby on Rails action centre for contacting elected representatives.
- Developed campaign tools and integrations that lowered barriers to public participation.

CTO 8 Mar 2013 – 9 Jan 2015
Earbits

Joined Earbits, a Y Combinator company, as a frontend engineer and became CTO, leading product engineering, infrastructure, and a small development team.

- Built the entire frontend single-page application in Backbone.js, talking to Rails services on MongoDB.
- Managed a small team of developers and designers.
- Moved all of the infrastructure from Heroku to AWS.

Developer 1 Jun 2013 – 1 Jan 2016
Taskforce.is

Developed civic technology and online campaigns opposing mass surveillance.

- Helped build The Day We Fight Back and related campaigns.
- Campaigns generated 37 million banner views, 100,000 phone calls to Congress, 500,000 emails, and 250,000 signatures.

Founder 1 Jan 2011 – 1 Jan 2014
BackboneTutorials.com

Created a widely read educational resource for JavaScript and Backbone.js.

- Reached over two million unique visitors annually.
- Generated 25,000+ ebook downloads and 300,000+ YouTube views.

Front-end Developer 1 Jan 2011 – 1 Jun 2012
Ephox

Ephox (now Tiny) builds TinyMCE, the open-source rich-text editor, and enterprise editing software. I built front-end widgets and applications (a major product on Backbone.js), worked on UI/UX design and wireframes, and designed API specifications and documentation.

Projects

Alpha From 1 Sep 2025
Creator · open source

A dependently typed programming language and compiler for AI learning systems. Compiles model mathematics, training loops, host code, and GPU instructions into self-contained executables without conventional machine-learning runtimes.

- Trained a 1.38B-parameter language model over 5.84B tokens on two H100 GPUs, averaging 247,865 tokens/sec with an Alpha-generated executable.
- Built native NVIDIA GPU code generation, FP8 kernels, attention, multi-GPU NVLink communication, and direct driver interfaces without CUDA, PyTorch, or NCCL on the training path.
- Developing dependent types, formal verification, and compiler infrastructure for agent-driven discovery of new algorithms and learning systems.

Donto From 1 Jan 2025
Creator · application

An evidence-first knowledge system for AI agents, built in Rust and PostgreSQL. Stores contradictory claims with provenance, bitemporal history, query-time reconciliation, and formal

verification.

- 42M+ statements and millions of evidence links, with large-scale LLM extraction and agentic-memory tooling.
- Custom query language, predicate alignment, temporal reasoning, and provenance-aware access control.
- 62 Lean 4 theorems proving core invariants, plus signed and reproducible knowledge releases.

llmtobinary From 1 Oct 2026

Creator · application

An experimental computing platform where language models generate literal executable machine bytes rather than source code, which are validated and executed on a custom virtual computer.

- Designed the ANMA-1 virtual instruction set, validator, interpreter, and WebAssembly execution path.
- Built an interactive browser-based virtual computer with memory, registers, devices, and visual execution tracing.
- Developed checker-assisted agent loops, independent correctness tests, and formal verification experiments.

Bode From 14 Sep 2026

Creator · application

Developing a general-purpose agent execution harness for persistent sessions across web, CLI, and local development environments.

- Designing durable agent orchestration, resumable sessions, and execution across local devices and remote workers.
- Exploring multi-computer execution, session branching, and long-running autonomous development workflows.

Prove2

Creator · application

An experimental mathematical reasoning platform connecting ideas, Lean 4 formal proofs, theorem libraries, and AI agents.

- Exploring machine-checked mathematical reasoning and proof-assisted AI research.
- Developing agent-friendly interfaces for theorem exploration, proof construction, and verification.

TPMJS From 1 Jun 2025

open source

Tool Package Manager for AI Agents. Discovers, validates, and exposes npm packages as tools through MCP, SDKs, and command-line interfaces.

- Automatic npm tool discovery and sandboxed Deno execution.
- MCP aggregation and agent tooling infrastructure.
- Platform for building, sharing, and extending AI agents.

Blocks From 1 Nov 2025

open source

A semantic validation system for AI-generated code, using domain specifications to detect inconsistencies and implementation drift.

- Declarative domain specifications using entities, signals, measures, and rules.
- Schema, structure, and LLM-based domain validation with actionable feedback for coding agents.

Toiletpaper From 1 Apr 2026

open source

An adversarial research-paper replication engine that extracts scientific claims, constructs evidence graphs, runs independent checks, and records reproducibility verdicts.

- Processed the Kolmogorov-Arnold Networks paper: 102 claims extracted, 24 reproduced, and 3 contradicted.
- Combines LLM extraction, simulations, mathematical checks, and provenance through Donto.

Omega From 1 Jun 2025

application

An AI-powered Discord agent with 80+ tools, multi-database memory, code execution, and autonomous improvement workflows.

- Code execution across 42+ programming languages.
- Agent tooling for software development, communication, and GitHub-driven self-improvement.

llm-benchmark From 1 Jul 2025

open source

CLI for using language models to optimize functions, validate functional equivalence, and benchmark implementations across languages and providers.

- Supports JavaScript, TypeScript, Python, Rust, and Go.
- Includes automated verification, performance comparison, a terminal UI, and cost analysis.

Drone Hire

Co-Founder · application

An international directory of civilian drone and UAV operators for hire: aerial photography and video, mapping, surveying, precision agriculture, inspections and infrared imaging. Built with Backbone.js, Node.js and Postgres.

- Over 200,000 visitors to the site and blog in 2014.

Education

The University of Queensland 12 Feb 2008 – 12 Dec 2009

Bachelors, Software Engineering (incomplete)

Awards

Defender of the Internet 2 Oct 2014

Fight For The Future

For my work against mass surveillance and building civic tools for digital democracy.

Publications

Backbone Tutorials

Self-published · book

Beginner-to-expert tutorials for Backbone.js, free online and as an ebook: 25,000+ downloads, 300,000+ YouTube views and over two million readers a year.

Volunteer Experience

Creator & Maintainer 1 Jan 2020 – Present

MobTranslate

Open-source language revitalization platform for Aboriginal Australian languages: dictionaries for dozens of languages, real-time AI translation, community voice recording, an Android keyboard, and a full speech/ML stack built with the community, not just for it. Supports 1,200+ language codes.

- Neural TTS pipeline: MMS-TTS (VITS) driven through a grammar-grounded orthography bridge that maps Kuku Yalanji spelling onto a same-family Pama-Nyungan donor voice (per Patz's reference grammar), per-word phonemic IPA for 2,679 dictionary words, deterministic seeded synthesis with full provenance, and a per-language model registry
- ASR for low-resource speech: wav2vec2/Omnilingual CTC fine-tuning pipeline with reproducible dataset builds, serverless training runs, and benchmark harnesses
- LLM translation fine-tunes with research-grade evaluation: lexical censuses, prompt ablations, dose curves, failure taxonomies, and curriculum replay datasets across Kuku Yalanji and Mi'gmaq
- Native Android keyboard (IME), community recording infrastructure where real speaker audio always outranks synthesis, and sentence-corpus pipelines that turn recordings into training manifests
- CARE-aligned governance: synthetic voices are explicitly flagged as scaffolds, donor voices are borrowed until a community licenses its own, and per-speaker (elder) models require explicit, revocable consent
- 300+ commits since 2025: elder-friendly portals, hosted adapters, release automation
- Earlier related work: an open-source computer-vision model that identifies the Australian Aboriginal Flag (2021)

Skills

AI, Agents & Machine Learning Advanced	LLM Training & Inference, AI Agents, Agent Orchestration, Model Context Protocol (MCP), Tool Calling, OpenAI / Anthropic / Gemini, Vercel AI SDK, RAG & Vector Search, Embeddings & Reranking, Evaluation & Benchmarking, Synthetic Training Data, Fine-tuning, Autograd, Tokenization, Speech Models (TTS / ASR)
Compilers, GPU & Formal Methods Advanced	Compiler Construction, Programming Language Design, Dependent Types, Lean 4, Formal Verification, GPU Architecture, GPU Machine Code Generation, NVIDIA SM86 / SM90, Vulkan, SPIR-V, CUDA-free GPU Computing, FP8 / FP16 / BF16, Multi-GPU Training, NVLink, ELF Executables, x86-64 / AArch64, C, Rust
Frontend Advanced	React, Next.js, TypeScript, JavaScript, HTML / CSS, Tailwind CSS, Styled Components, Redux, GraphQL / Apollo, Electron, Three.js, Backbone.js
Backend Advanced	Node.js, Go, Rust, Python, PHP / Laravel, Ruby on Rails, Bun, Deno, PostgreSQL, MongoDB, Redis, GraphQL, REST APIs, WebSockets, Server-Sent Events
Cloud & DevOps Advanced	AWS, Google Cloud Platform, Cloudflare Workers, Durable Objects, Docker, Kubernetes, Vercel, Railway, Heroku, GitHub Actions, CI/CD, Linux, Serverless
Architecture & Engineering Advanced	Distributed Systems, System Design, Event Sourcing, Database Architecture, Real-time Collaboration, API & SDK Design, Monorepos, Turborepo, High-performance Computing, Concurrency & Data Integrity, Knowledge Graphs, CLI & Developer Tooling, Open Source Maintenance, Benchmarking & Testing

Languages

English	Native speaker

Interests

Programming Languages & Computer Science	Compiler Design, Formal Methods, GPU Computing, Experimental Computing
Open Source	Developer Tools, Open Standards, Community Infrastructure
Languages & History	Linguistics, Language Revitalization, Genealogy, Historical Research
Gardening	Lazy Gardening
Music	Guitar, Singing, Dancing
Books	Reading, Writing, History, Science Fiction

References

Joey Flores, Co-founder and CEO of Earbits, Inc.

Thomas was hired as a lead developer and, upon the leaving of our co-founder took over as CTO of Earbits. Thomas is, hands down, one of those A Players you hear of companies dying to hire. He is incredibly smart, not just at code but about everything from classical music to Chinese language and culture. Thomas is great to work with and, as a well established contributor to open source projects and several successful ventures, commands the respect of engineers at all levels. I would suggest doing anything you can to have him on your team.

Yotam Rosenbaum, SVP of Operations, Earbits, Inc.

I've had the great pleasure of working with Thomas for the past three years at Earbits, and on a few side projects. Two years ago our CTO left on a moment's notice, Thomas saved our company by quickly stepping up to fill this role. He has been with our company through thick and thin and made serious personal sacrifices in order to help the company during tough times. He is a phenomenal hacker and a true team player. Highly recommended!

Ryan Kirkman, Senior Software Engineer at Nerdwallet

Thomas is an extremely talented engineer with a very broad range of skills and experience. From being a thought leader in the front-end community via backbonetutorials.com and cdnjs.com, to designing and implementing the API for cdnjs.com, working with Thomas has been fantastic learning experience. Thomas is truly a full stack develop, and his work output is incredible. If there is any opportunity to work with Thomas, I take it. He is the definition of an A player.

Greg Davis

On Thomas Davis... Hire this guy. Do not be fooled. Incredibly capable and fast. Plays well with others. Unbelievable at front-end work end programming but that is just the start. Visionary. Hire him before I do.