Daniel Alberto Herrera-Rendon

Senior Haskell & Nix Engineer · Reproducible Infrastructure · Programming Languages

hhefesto@rdataa.com · hhefesto.dev · GitHub · LinkedIn

Denver, Colorado · Open to fully remote U.S. and international roles
U.S. and Mexican citizen · No U.S. visa sponsorship required · Native English and Spanish

SUMMARY

Software engineer and independent consultant with over a decade of experience across backend engineering, DevOps, scientific computing, and developer tooling. Specialize in production Haskell systems and reproducible infrastructure with Nix/NixOS, from backend development to CI/CD and deployment. Experience includes infrastructure modernization at FPComplete for Simspace, DevOps and backend engineering at Tontine Trust, and technical leadership of a scientific software platform. Combine hands-on engineering with programming-language development, independent research, and mentoring; lately, verified software in Bend.

PROFESSIONAL EXPERIENCE

CTO — RDATA S de RL MI · xpsoasis.org 2016–Present

- Migrated XPSOasis from PHP to Haskell/Yesod; developing its Servant/Reflex successor with shared API types and desktop compatibility.
- Ported AAnalyzer to Linux and the web; developing Spectra2, a Haskell fitting engine with Agda specifications and numerical parity tests.
- Maintain NixOS infrastructure, automated deployments, PostgreSQL, and backups; trained and mentored developers in Haskell.
- Collaborate with Los Alamos National Laboratory on AI-assisted X-ray photoelectron spectroscopy (XPS) fitting.

Senior DevOps & Haskell Developer — Tontine Trust April–August 2025

- Built and maintained a deploy-rs deployment pipeline across Rumble and OVH for development, staging, and production environments.
- Managed PostgreSQL migrations and Cachix build caching; integrated OVH Object Storage through Amazonka.
- Developed Haskell/Servant backend services and a Reflex FRP frontend connected to an internal LLM API.

Senior Haskell Developer — FPComplete July 2022–May 2023

- Held site reliability engineering responsibilities for client Simspace, maintaining and modernizing its Nix infrastructure.
- Introduced Nix flakes, updated haskell.nix, and configured Cachix binary caching.

Software Engineering Intern — Microsoft · Redmond, Washington Summer 2016

- Built an Excel add-in with a Scratch-inspired macro recorder, delivered as part of an internal productivity initiative.

Co-Founder & Developer — Slice 2015–2016

- Designed and built a REST API in Clojure and configured production Linux servers with PostgreSQL, Tomcat, and nginx.

Software Developer — Blue Messaging SA de CV July–November 2015

- Implemented Java parsers for natural-language number conversion and date normalization to UTC.

CTO & Innovation Coordinator — Red Wolf SA de CV August 2014–January 2015

- Architected the backend API, database, and AWS EC2 hosting; designed and conducted technical interviews to grow the development team.

OPEN-SOURCE DEVELOPMENT & INDEPENDENT RESEARCH

Core Language Developer — Stand-In Language / Telomare January 2020–Present

- Develop Telomare's Haskell compiler, evaluators, and language server, using distinct syntax types to enforce compiler-stage boundaries.
- Accelerated the tic-tac-toe compilation benchmark from approximately 122 to 14 seconds (8.7×); prototyped static memory bounds for refinement-valid inputs, checked against measured heap usage.
- Extended its elementary affine logic (EAL) certification for interaction-combinator evaluation (shared definitions certified, memory bounded); porting the compiler to Bend (in progress).
- Maintain Nix builds (ekapkgs), GitHub Actions CI, and Cachix caching; mentored two Haskell contributors.

ana — Language Modeling, Formal Methods & GPU Training · Site · Code 2025–Present

- Built a 115-million-parameter hybrid gated linear/softmax attention language model with a proven meaning: its specification is theorems Bend checks; the model, GPU trainer, decoder and data tools are Bend programs.
- Began with Agda specifications, a Haskell reference and Futhark kernels (trained on Wikipedia and FineWeb-Edu on one RTX 3090), then ported it all to Bend; outputs and gradients are checked across implementations.
- Built a CUDA/cuBLAS training backend, incremental decoding, and resumable training pipelines with dataset and tokenizer identity checks; deployed prebuilt Nix closures to rented GPUs to avoid compiling on paid time.
- Investigated attention-gate behavior to guide architecture changes and corrected unstable recurrent-attention gradients, validating the fixes across Haskell, Futhark, and cuBLAS implementations.

El cubo de Edgar — Optimal Rubik's Cube Solver · Site · Code 2026

- An optimal solver in Bend (Korf's IDA∗), its group theory as proven laws; it runs in the browser, one worker per core.

Bend tools · mugen · bend-frp · agda2bend 2026

- mugen: a never-ending AI chat in the terminal, its memory a binary tree of summaries. bend-frp: FRP after Conal Elliott, proved to agree with its meaning (hhefesto.dev runs on it). agda2bend: Agda modules to checked Bend 2.

TECHNICAL SKILLS

- **Languages:** Haskell, Bend, Nix, PureScript, Agda, C/C++; additional experience with Clojure, Java, SQL, and PHP.
- **Functional web development:** Servant, Yesod, Reflex FRP, persistent/esqueleto, Amazonka.
- **Infrastructure & delivery:** NixOS, flakes, flake-parts, haskell.nix, deploy-rs, Cachix, GitHub Actions, nginx, agenix, home-manager.
- **Cloud platforms:** Hetzner, OVH, GCE, AWS; S3-compatible object storage.
- **Databases:** PostgreSQL, MySQL, Microsoft SQL Server.
- **Language implementation:** Parsec, Megaparsec, evaluators, annotated syntax trees, module systems, language-server tooling.

EDUCATION

Instituto Tecnológico Autónomo de México (ITAM) — Mexico City

- Undergraduate studies in Computer Engineering, Applied Mathematics and Economics.

SELECTED HONORS & COMMUNITY

- Third place, Concurso Interuniversitario Iberoamericano de Matemáticas, 2013.
- Honorable mention, Mexican National Mathematics Olympiad (OMM); first place, Querétaro State High-School Mathematics Olympiad.
- Competed in three ACM-ICPC regional rounds.
- Invited speaker, Proof-of-Work seminar, mathematics department, Universidad Autónoma de Querétaro.