

SOFTWARE DEVELOPER

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SUMMARY

Software developer specializing in functional programming and cryptography-driven systems, with extensive experience in Haskell and growing experience in Rust, alongside JavaScript/TypeScript. Work spans distributed systems, blockchain infrastructure, and zero-knowledge protocols.

Background in mathematical research and type-driven system design, with a focus on correctness, formal reasoning, and modular architecture. Recently focused on AI-assisted software development through rigorous specification design.

Key Expertise

- *Programming Languages:* Haskell, Rust, JavaScript/TypeScript, Scala
- *Functional Programming:* Type-Driven Design
- *Distributed Systems:* Blockchain Infrastructure, Cardano / UTxO Model
- *Cryptography:* Zero-Knowledge Proofs, Cryptographic Protocols, zk-SNARKs
- *Software Architecture:* Modular Systems, Specification-Driven Design
- *Development Workflow:* AI-Assisted Software Development

EXPERIENCE

- ZKFOLD – JUL 2024 - JAN 2026
 - ❖ Full time Haskell / TypeScript developer.
 - ❖ Developed zero-knowledge protocols and cryptographic solutions for Web3 systems.
- GENIUS YIELD – JAN 2024 - JUNE 2024
 - ❖ Full time Haskell developer (Core Development Team).
 - ❖ Contributed to development of a Cardano-based decentralized exchange (DEX).
- MODULO-P – MAY 2023 - AUG 2024
 - ❖ Won 2nd place at the *Zero Knowledge* track of the *Cardano Emurgo Build 2023 Hackathon*.
 - ❖ Received *Project Catalyst Fund 10* funding to develop a ZKP framework based on Hydra (all milestones completed, 2024).

- ❖ Received *Project Catalyst Fund 11* funding to develop a Zero-Knowledge Cardano Privacy Layer for Membership Verification and Anonymous Voting (all milestones completed, 2025).
- REITCIRCLES – OCT 2022 - DEC 2023
 - ❖ Technical consultant and Web3 developer.
 - ❖ Assisted in development of the project roadmap.
 - ❖ Designed and implemented a *deflationary minting policy* for REIT's token (Aiken).
 - ❖ Designed and implemented an *updatable multisig treasury* (Aiken).
- AYLLU ACADEMY – FEB 2022 - JUN 2023
(*Project Catalyst Fund 7* initiative)
 - ❖ Created a *Haskell* online course oriented towards *Plutus* smart-contract development.
 - ❖ Developed smart contracts for the *student-enrollment* and the *learn-to-earn* modules of the platform.

CERTIFICATIONS

- Emurgo Academy
 - PROFESSIONAL DEVELOPER – JUL 2022 - DEC 2022
Plutus - Smart Contracts Development
[View certificate](#)
 - ASSOCIATE DEVELOPER – JAN 2022 - MAY 2022
Blockchain - Cardano Architecture and Design - Haskell
[View certificate](#)
- IO Global
 - MARLOWE PIONEER PROGRAM (FIRST COHORT) – MAY 2022 - JUL 2022
 - PLUTUS PIONEER PROGRAM (THIRD COHORT) – JAN 2022 - MAR 2022
- Wolfram Research, Inc.
 - WOLFRAM LANGUAGE CERTIFIED INSTRUCTOR - SINCE 2018

SKILLS

Programming Languages

- Haskell, Rust, Javascript, Typescript, Scala, SQL, Python, Wolfram Language.

Smart Contract Platforms

- Plutus, Aiken, Compact

Frameworks & Web Technologies

- React, Node.js, HTML, CSS

Other Technical Areas

- Quantum Computing (Qiskit, Cirq)

Research Background

- Geometric methods in mathematical physics.

ACADEMIC BACKGROUND & TEACHING

Previously held academic positions in mathematics and physics, including roles at *Instituto Tecnológico Autónomo de México (ITAM)*, *Universidad Autónoma Metropolitana (UAM-I)*, *Tecnológico de Monterrey*, and *UNAM*.

Academic work focused on *geometric methods in dynamical systems*, *celestial mechanics*, *mathematical physics*, as well as quantum computation.

Highlights:

- PhD in Mathematics from **Caltech** under **Jerrold E. Marsden**
- 11 peer-reviewed research papers published
- Supervised undergraduate and master's theses
- Delivered 60+ academic talks and workshops
- Member of Mexico's **Sistema Nacional de Investigadores (SNI Level I)**

ACADEMIC CREDENTIALS

- California Institute of Technology (CALTECH) Ph.D., Mathematics – 1995 - 2002 Thesis: *Regularization of the Amended Potential Around a Symmetric Configuration*. Advisor: Jerrold E. Marsden
- Universidad Nacional Autónoma de México (UNAM) B.Sc., Physics – 1989 - 1994 Thesis: *Wave operators in the Scattering Theory in Classical Mechanics*. Advisor: Ricardo A. Weder Zaninovich.

REFERENCES

Available upon request.

Portfolio: <https://antoniohernandez.mx/portfolio.html>

Publications: <https://antoniohernandez.mx/publications.html>