Waylon Jepsen

Pluto Labs inc. waylonjepsen1@gmail.com

Education

Aug. 2022 - (Dropped Out)

Colorado State University
Computer Science Ph.D. Program

Thesis Topic: Economic activity in distributed ledgers.

Jan 2020 - May 2022

Colorado State University
Master of Science M.S

Thesis Topic: Tropical Algebraic Modeling of TCP Congestion.

Aug. 2012 - May 2017

Colorado State University
Bachelor of Science in General Mathematics & Philosophy
Thesis Topic: Elliptic Curve Cryptography

Experience

Staff Applied Cryptography Engineer, Pluto Labs Inc, May 2024 - Current

- Built zero-dependancie pairings in rust
- Implemented post-quantum cryptographic primitives
- Implemented the fastest client side proving backend in rust
- Built Ghash and AES Circom and noir circuits according to NIST specifications and test vectors
- Optimized compile pipelines across wasm circom and rust

Principal Research Engineer, Primitive Bits, April 2022 - May 2024.

- Perform research and development of decentralized financial instruments in the EVM. Particularly dynamic automated market makers.
- Participated in discussion and implementation details of EIPs
- Built Rust ethereum modeling architecture: Arbiter

- Contributed the Reth, Revm, and ethers-rs
- Wrote technical educational content on rebalancing, arbitrage and constant function market makers.
- Developed and maintained security and analysis tools for the EVM in rust used by the greater community.

Ethereum Foundation, Grant Recipient, Part time, December 2023

- Received a grant to perform cryptanalysis of Poseidon algebraic hash function.
- Focused on algebraic attacks over small fields.
- Documented our work: Poseidon

Optimism, Developer Advisory Board, Part time, November 2023 - Season 1

- Served on a technical board for optimism governance to ensure the technical quality of projects receiving funding from the optimism foundation.
- We evaluated the technical integrity of blockchain projects.

Aztec, Contractor, Part time, July 2022

- Wrote Zero-knowledge proving infrastructure in Rust

Hacker Houses, Part time, September 2022 - Present

- Ran developer communities Wehack
- Raised over $250k in grants from 30+ protocols and VCs
- Organized 6 hacker house series with over 2800 visitors in 3 continents
- Hosted 200 residential hackers who hacked 90 projects and raised about $30M for their projects
- Supported 25 super talented hackers and on a monthly 0.5 Eth (up to $25k/month) in UBI (Universal Basic Income) for their open-source work

Researcher, Network Engineering, Colorado State University, May 2021 - May 2022.

- Investigated the tropical algebraic semirings.
- Modeled TCP Congestion with Tropical Algebra.
- Built discrete event simulators to validate the model.

Developer Relations, Hedera Hashgraph, July 2021 - April 2022.

- Produced written and recorded content to educate software engineers on how to use our software development kits.

- Led workshops to teach software engineers how to write and deploy their smart contracts to the Hedera network (Besu EVM).
- Worked on open cryptography problems concerning threshold cryptography and Shamir's Secret Sharing.

Systems Administrator, Colorado State University Aug 2020 - Dec 2021.

- Assisted the systems team with the administration of more than than 500 Linux workstations.
- Built automation scripts, recorded offline backups, and managed security upgrades.
- Performed database management using MariaDB, PostgreSQL, and MongoDB.

Cyber Security Analyst, Academic Computing and Networking services Jan 2017 - 2018.

- Performed research and development of distributed ledger technology to improve the security of our University networks.
- Presented on identity authentication and phishing attacks.
- Created voting security software using distributed ledger technology.

Research

1. W. Jepsen, *Replicating Portfolios: Constructing Permissionless Derivatives*, preprint, 2022. Available at arXiv: 2205.09890.
2. W. Jepsen *Cyclic Redundancy Checks and Error Detection*, preprint, 2022. Available arxiv: 2205.11344
3. W. Jepsen, C. Roberts *Analysis of the RMM-01 Market Maker*, Available here
4. A. Angel, W. Jepsen, C. Roberts, E. Sterrett *Financial Virtual Machine*, Available here

Talks

Introduction to Decentralized Finance. Financial Technology Seminar at Colorado State University, Nov 2022

Analysis of Statistical Arbitrage in Blockchains. Database Security Group at Colorado State University, Oct 2022

Analysis of Constant Function Market Makers. DARPA Riser at Colorado State University, Sep 2022

Constant Function Market Makers. Database Security Group at Colorado State University, Aug 2022

Tropical Algebraic Analysis of TCP. Computer Science Seminar at Colorado State University, May 2022

Cyclic Redundancy Checks and Error Detection. Computer Science Seminar at Colorado State University, Aug 2021

The Lazarus Group: North Korea's Cyber War. Cyber Security Seminar at Colorado State University, May 2021

Epistemic Temporal Logic and Information flow Security. Cyber Security Seminar at Colorado State University, Jan 2021

HTTPS What it is and why it's Important. Cyber Security Seminar at Colorado State University, Aug 2019

The Mathematics of Elliptic Curve Cryptography. Cyber Security Seminar at Colorado State University, April 2019

Industry Involvement

Zuzalu Resident, explored the future of city states with other leaders in the industry

Ethereum Denver Hosted hacker house sponsored by Paradigm, Flashbots, Risc0, and Celestia (ETHDEN'23)

ETHGlobal: Ethereum San Francisco (ETHSF'22)

Crypto Economics Security Conference (CESC'22)

Zero-Knowledge Proof Workshop (affiliated with CESC22)

ACM Conference on Economics and Computation (EC'22)

Ethereum Denver (Speaker) (ETHDEN'22)

Teaching and Awards

CS 364: Computer Security, *Supervised College Teaching* — Spring 2022
DARPA Riser *Research Award* — Fall 2022

Masters Advisor

Name	Craig Partridge
Department	Colorado State Computer Science
Position	Department Chair
Contact	Craig.Partridge@colostate.edu

Doctoral Advisor

Name	Amani Altarawneh
Department	Colorado State Computer Science
Position	Assistant Professor
Contact	Amani.Altarawneh@colostate.edu