

# NIELS CHRISTOFFERSEN

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## Education

### Reed College

*Bachelor of Arts in Computer Science*

**Aug. 2020 – May 2024**

*Portland, Oregon*

### Relevant Coursework

- Deep Learning
- Cryptography
- Algorithms & Data Structures
- Computer Systems
- Cryptography
- Computability & Complexity
- Philosophy of Artificial Intelligence
- Linear Algebra
- Private and Fair Data Analysis
- Formal Logic

## Experience

### Los Alamos National Laboratory

*Software Engineer Intern Under Mentor Mark Galassi*

**May 2021 – July 2021**

*Los Alamos, New Mexico*

- Architected and executed complete build system migration from GNU autotools to Meson for the DIORAMA Framework, a mission-critical space nuclear detection simulation system used by multiple government agencies, achieving 50% compilation time reduction
- Developed Python automation scripts for complex multi-physics simulation framework supporting satellite constellation modeling, nuclear event detection, and real-time space vehicle analysis
- Contributed to codebase supporting U.S. Space Nuclear Detonation Detection program with strict industry standards and continuous integration requirements

## Projects

### Research Paper on the Failures of CONIKS | *Cryptographic Analysis*

**May 2023**

- Conducted comprehensive security analysis of CONIKS key transparency protocol, identifying critical vulnerabilities in key change policies, recovery mechanisms, and whistleblowing protocols
- Performed formal threat modeling and cryptographic verification to expose fundamental design flaws in widely-adopted transparency system
- Presented findings that contributed to improved understanding of key transparency system limitations and security requirements

### Longball Analytics | *Pytorch, Python*

**March 2025**

- Solved complex MLB valuation problem by developing novel LSTM-based prediction system that accurately forecasts multi-year player performance trajectories, addressing significant market inefficiencies in player evaluation
- Engineered innovative arbitration salary prediction algorithm combining historical performance data with advanced time-series modeling, achieving superior accuracy over traditional linear projection methods
- Created comprehensive player trade value computation system integrating salary projections with performance forecasts to identify undervalued assets
- Built full-stack web application with custom backend API and interactive frontend to demonstrate real-world application of predictive models
- Open-sourced implementation: LSTMLB — Live demo: longballhq.xyz

### Adaptive Huffman Encoding System | *C++, STL*

**April 2023**

- Engineered complete lossless data compression system implementing adaptive Huffman coding with dynamic frequency table updates, achieving 30-60% compression ratios on text files
- Developed custom data structures including priority queue-based forest management, binary tree path finding, and bit-level I/O streaming for optimal encoding performance
- Implemented comprehensive encoder/decoder pipeline with binary file format handling, demonstrating deep understanding of memory management and systems programming
- Built robust testing framework with unit tests covering edge cases, performance benchmarking, and lossless verification across multiple file types

## Technical Skills

**Languages:** Python, C++, R, SQL

**Developer Tools:** Copilot, Git, VS Code, Pytorch, AWS, Microsoft Office, Qualtrics

**Technologies/Frameworks:** Linux, GitHub, Windows, Meson