JACKSON WALTERS

Arlington, VA | 703-915-6542 | jacksonwalters@gmail.com | https://jacksonwalters.com

Ph.D.-level machine learning engineer, cryptography specialist, and applied mathematician with a strong record in scientific programming, data science, and higher education. Skilled in lattice-based cryptographic systems, machine learning, and optimization. Published author in the Annals of Statistics and Advances in Mathematics. Seeking data science, QA, or applied cryptography roles combining research depth and software engineering expertise.

WORK EXPERIENCE

Cryptography Fellow Zaiku Group, Ltd.

Nov 2024 - Present Washington, DC

- Collaborated with mathematicians in the Homotopic Minds math-to-industry transition program applying lattice-based methods to post-quantum cryptography.
- Implemented ring-LWE, module-LWE, NTT, and ML-KEM encryption primitives in Rust; compliant with FIPS 203 and NIST PQC guidelines.
- Published production cryptographic crates to Crates.io [ring-lwe, module-lwe, ntt, mlkem-fips203].
- Delivered public technical talks and authored educational blogs promoting open-source cryptography awareness.
 Blog: A Practical Introduction to Lattice-Based Cryptography [https://jacksonwalters.com/blog/?p=83]
 Talk: Lattice Cryptography in Rust [https://www.youtube.com/live/BTsz6-ZPYmM]

QA Engineer

Oct 2020 - Jan 2021

Washington, DC

Power Auctions, LLC

- Performed QA testing for FCC Auction 107 (5G wireless licenses), contributing to a \$80B + \$300M system close.
- Designed extreme-value bid simulations to uncover numerical stability issues in MILP solvers (Gurobi); coordinated debugging and CI regression tests.
- Authored white paper on floating-point limitations in optimization software and proposed mitigations for solver reliability.

Teaching Fellow

Aug 2013 – May 2019

Boston University

Boston, MA

- Taught undergraduate mathematics courses and led multiple discussion sections each semester.
- Conducted mathematical research leading to publications in top-tier journals.
- Presented work at international conferences (BU–KEIO) and mentored undergraduate research in machine learning.

PROJECTS

Lattice-based Labs (https://github.com/lattice-based-labs)

- ring-lwe: Rust implementation of leveled homomorphic encryption primitive ring-LWE; published on Crates.io.
- module-lwe & mlkem-fips203: Rust crates extending ring-LWE to module-LWE and ML-KEM; compliant with NIST PQC standards; published on Crates.io.
- **ntt:** Optimized number-theoretic transform (NTT) library supporting composite moduli for efficient multiplication operations; published on Crates.io.

Walters Labs (https://github.com/walters-labs)

- **open-encrypt:** Prototype encrypted messaging web/iOS app (Python + PHP + SQL + Swift) implementing ring-LWE/module-LWE public key encryption.
- wordchef: Prototype game mixing words using vector embeddings (PHP + pgSQL + pgvector + Swift).
- PINN: Physics-informed neural network solving the Black-Scholes option pricing equation.
- **SIGINT:** Standard examples of signal intelligence workflows in Python; published to PyPI as sigint-examples.
- · quantum-computing: Implementation of Shor's algorithm for IBM Qiskit.
- regularization-neural-networks: Methods for regularizing neural networks via nuclear-norm rank reduction.
- neuroimage-analysis: Analysis of brain-scan data using diffusion tensor imaging (DTI) and related methods.
- aes-block-cipher-modes: Implementation of AES block cipher modes from NIST SP 800-38X series.

Personal (https://github.com/jacksonwalters)

• natural-language-processing: Implemented 10+ NLP algorithms including classification, summarization, topic modeling, and hate-speech detection.

- optimization: Python optimization examples using Gurobi and cvxpy; analyzed floating-point errors in MILP solvers.
- machine-learning: Visualized SAMHSA mental health data with t-SNE + k-means; built XGBoost and CNN classifiers.
- finance: Financial modeling in Python (ARIMA, GARCH, Black-Scholes, CAPM, XGBoost).
- scotus-v-public: Compared judicial decisions with public sentiment using tf-idf and binary classifiers in a Flask webapp.
- cryptography-basics: Cryptography in Python ECC, NTRU, ring-LWE, module-LWE.

PUBLICATIONS

Advances in Mathematics | Vol. 386 (2021), 107799. *Toroidal prefactorization algebras associated to holomorphic fibrations and a relationship to vertex algebras.*Aug 2021

Annals of Statistics | Vol. 48, No. 1 (2020), 514–538. *Averages of Unlabeled Networks: Geometric Characterization and Asymptotic Behavior.*

arXiv Preprint | The Modular DFT of the Symmetric Group, [submitted to JoAC, https://arxiv.org/abs/2404.05796] Apr 2024

EDUCATION

Doctor of Philosophy in Mathematics	May 2019
Boston University	·
Bachelor of Science in Mathematics and Physics; Minor in Computer Science Virginia Tech	May 2013
Study Abroad	Jul 2011
Victoria University of Wellington	
CERTIFICATIONS	
Machine Learning Professional IBM	Mar 2024
Advanced Data Science Specialization IBM	May 2024
Fundamentals of Quantitative Modeling Wharton School	Aug 2025
Introduction to International Criminal Law Case Western Reserve University	Mar 2024
Rust Fundamentals Duke University	May 2024
Certificate of Completion The Data Incubator	Aug 2018
SKILLS (1-5)	

Python (4)	SageMath (5)	 Latex (3) 	 – Machine Learning (4)
Rust (4)	 Mathematica (4) 	Unix/Linux (3)	Cryptography (4)
- PHP (3)	MATLAB (3)	- SQL (3)	- NLP (3)