

Summary of Qualifications

- **Advanced Math & Physics:** Deep expertise in hyperbolic geometry, Kleinian groups, Galois theory, crucial for secure algorithm design.
 - **Robust R&D:** 10+ years at top institutions (Arizona, SFSU, Penn State, NTU), bridging theoretical methods and real-world challenges.
 - **Security & Cryptography:** Applied curvature, limit sets, and Galois groups in post-quantum encryption and secure data protocols.
 - **Computational Skills:** Python (NumPy, scikit-learn, PyTorch), R, C/C++, Java, Lisp, Mathematica; built large-scale cryptography tools.
 - **Adaptive Learning:** Quickly masters new fields (real/stochastic analysis, Lean 4, LLM-based proof automation).
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Education

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| University of Arizona <i>M.S. in Mathematics</i> , advanced Ph.D.-level coursework | (Expected Spring 2025) |
| San Francisco State University <i>M.A. in Mathematics</i> ; Thesis on Schottky groups (Advisor: Dr. C.-K. Lai) | (Spring 2022) |
| University of San Francisco <i>B.S. in Mathematics, Minor in Computer Science</i> , GPA: 3.88/4.00, Honors | (Fall 2018) |

Core Competencies

Mathematical Cryptography & Security:

Hyperbolic geometry, Kleinian groups, post-quantum cryptography, topological vulnerabilities.

Data Analysis & Machine Learning:

Transformer architectures (multi-head attention), autoencoders, geometric/topological ML approaches.

Algorithm & HPC Development:

Python/C++ for large-scale data, GPU-accelerated ML, system-level optimization.

Research & Technical Writing:

Multiple publications/presentations; formal proof tools (Lean 4, LLMs).

Relevant Research Experience

University of Arizona (2022–Present)

- *Prof. S. Sethuraman:* Real analysis; self-studied stochastic processes for cryptanalysis.
- *Prof. S. Cherkis:* Explored Nahm equations, geometric field theories, and used Lean 4+LLMs for secure AI.
- *Prof. N. Hao:* RTG Project on transformer attention scaling.
- *Prof. C. Haessig:* Investigated corresponding polynomials of Galois groups by writing Python code, self-studying this for cryptographic classification.
- *Prof. D. Glickenstein:* Mentored a project reconstructing Mirzakhani's study on hyperbolic geometry and closed geodesics, with self-study on its application for encryption using transformer architectures and autoencoders.

San Francisco State University (2019–2022)

- Computed Hausdorff dimension of Schottky groups; applied fractal geometry for data obfuscation.
- Applied the prime geodesic theorem to secure high-dimensional data.

Pennsylvania State University (2017–2018)

- Investigated Hardy's proof of uniform distribution (pseudo-random generation).

- Studied topological invariants for encryption algorithms.

NTU—LeCosPA (Pre-Baccalaureate, 2011–2013)

- Researched TQFT, AdS/CFT, and vacuum energy; early work in quantum cryptography.
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Additional Research Projects

Self-Study: Semisimple Rings and Radicals in Coding Theory and Cryptography

Based on Prof. Klaus M Lux’s lecture (Spring 2025), this project explores the role of semisimple rings and the Jacobson radical in coding theory and cryptography. Topics include linear codes over rings (e.g., \mathbb{Z}_4), group algebras, ring-based cryptosystems (NTRU, Ring-LWE), and ten concrete examples illustrating how nontrivial radicals influence cryptographic security.

Teaching & Leadership

University of Arizona (2022–Present): GTA for College Algebra/Calculus, integrating cryptography concepts into lessons.

San Francisco State University (2019–2022): GTA for Calculus, focusing on proof-based exploration.

Awards & Certifications

- Nominated for MSRI Summer School, Oxford (Metric Geometry)
 - Information Security Awareness & Safety Training, Univ. of Arizona (2023)
 - MASS Scholarship, Penn State (Full Tuition, 2017)
 - ACM SIGMOD Service Award (2016)
 - Big Data, MIT CSAIL (2015)
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Technical Skills

Languages & Tools: Python, C/C++, Java, Lisp, R, Mathematica, Shell, Lean 4, Git/GitHub, L^AT_EX.

Methods: Real/complex analysis, measure theory, topology, functional analysis, stochastic processes, encryption/decryption, HPC, advanced cryptography.

Additional Info

Faith: Catholic (28 years, e-Knight of Columbus, awaiting CUF exemplification)

Languages: English (Fluent), Conversational Japanese/German/Taiwanese; Learning French/Spanish/Italian

Memberships: Pi Mu Epsilon (USF)

References: Available upon request