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Sylvan Martin

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https://sylvanm.github.io

Education

Undergraduate – Cornell University **Aug 2021 – May 2025**
B.A. Mathematics, B.A. Computer Science cum laude

Relevant Courses: Analysis of Algorithms (Graduate Level), Randomized Algorithms, Lattices (Graduate Level), Probability, Cryptography, Honors Linear Algebra, Honors Analysis, Honors Algebra, Honors Object Oriented Design

Graduate – Cornell University **Aug 2025 – May 2027**
M.S. Computer Science – one of seven students in a funded, two-year research program (ongoing)

Research

Universal Connection Schedules for Reconfigurable Networking **— Submitted to SODA 2026** **April 2025**
Authors: Shaleen Baral, Robert Kleinberg, Sylvan Martin, Henry Rogers, Tegan Wilson, Ruogu Zhang

Probabilistic Gerrymandering **— Final Project for CS 6820** **December 2024**
Authors: Sylvan Martin, Henry Rogers, Ramisha Hossain

Projects

See GitHub Portfolio for source code and descriptions

- **ml_kit** — A pure-Rust machine learning library implemented from scratch for a school project, earning an A+
- **MatrixKit & matrix_kit** — Abstract linear algebra libraries (written in pure Swift and Rust, respectively)
- **rusty_crypto** — Implementations of LWE, Speck, Shamir Secret Sharing, SHA-512 in pure Rust
- **hemlock_lib** — Application for secure and redundant cloud storage, written in Rust and C
- **BigNumber** — Arbitrary precision arithmetic in Swift

Work Experience

Student Researcher – CS Theory **Fall 2024 – Present**
Cornell University *Ithaca, New York*
- Conducting research on datacenter routing schemes with Professor Robert Kleinberg, using group theoretic constructions of graphs to design network topology oblivious to traffic
- Completed paper which was submitted to FOCS 2025 and SODA 2026

Lead TA for Intro Analysis of Algorithms **Fall 2023, Spring 2024, Spring 2025**
Cornell University *Ithaca, New York*
- Managed groups of undergraduate TA's to help with course administration
- Created rubrics, helped with homework design, and assigned grading groups
- Hosted weekly office hours to assist with homework, review, and exam preparation
- Held weekend lecture on NP-Completeness to give students additional material

TA for Cryptography **Fall 2024**
Cornell University *Ithaca, New York*
- TA for CS 4830, Introduction to Cryptography ($\sim$ 40 people in the course)
- Helped students learn theoretical cryptographic concepts and primitives such as encryption, one way functions, commitment schemes, key exchanges, and more
- Course emphasized a rigorous and proof-based approach to cryptography

Cornell Outdoor Education Instructor **Fall 2022 – Present**
Cornell University *Ithaca, New York*
- Guided 8-day backpacking and rock climbing trips for incoming freshmen to help their transition to college
- Led one-week rock climbing expedition in Red Rocks, Nevada (Cornell PE 1645)
- Taught students how to climb Giant Sequoia trees and assisted with forestry research (Cornell PE 1659)
- Teaches caving and rock climbing classes to students of all levels

Flight Software Engineering High School and College Intern **Summers 2018 – 2021**
Johns Hopkins University Applied Physics Laboratory *Laurel, Maryland*
- Assisted development of embedded, real time avionics control software on a flight single board computer for the Dragonfly mission mobility project
- Developed and tested flight software code for autonomous glide body and quad-copter to fly on Saturn's Moon, Titan
- Conducted research on Intel's Digital Random Number generator to verify Intel's claims of randomness and cryptographic security

Talks

Oblivious Reconfigurable Networks **— University of Michigan CS Theory Group** **13 December 2024**