Alistair Pattison

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EDUCATION

Bachelors of Arts, Mathematics & Statistics, Carleton College

(September 2020 - June 2024)

- 3.99 GPA, minor in Digital Arts and Humanities.
- Captain of varsity track and field, all-conference honorable mention at 800m.
- Studied abroad at the University of Cambridge taking classes in computer science and history.
- Theses: An Introduction to Analytic Number Theory (math), Live Win Probabilities in Soccer with RNNs (stats).

Work Experience

Research Assistant, University of Minnesota

(September 2022 – present)

- Work with Professor Nicholas Hopper to develop methods for reporting abuse on encrypted messaging platforms that preserve users' privacy.
- Write and benchmark proof-of-concept implementations in Python and Rust.
- Presented findings at a first-tier security conference in 2023. We plan to publish more results in 2024.

Teaching Assistant, Carleton College

(March 2021 - present)

- Tutor students, grade homework, and hold office hours for classes in the math and computer science departments.
- Classes: Algorithms, Artificial Intelligence, Real Analysis I, Abstract Algebra I, Data Visualization, Math Structures, and Calculus II.

Statistical Consultant, Minnesota Department of Human Services

(September 2023 - November 2023)

- Worked with interdepartmental task force to help make Minnesota's government systems more inclusive of older adults.
- Analyzed American Community Survey data to identify demographic disparities in wealth, housing, and internet access.
- Created data visualizations and interactive dashboards for use by government employees and other consultants.

The Food Guy, YMCA Camp Widjiwagan

(June - September 2021)

- Oversaw the purchase and distribution of food for nearly 200 wilderness trips across the US and Canada.
- Managed a \$95,000 budget alongside two other employees and taught basic nutrition to kids aged 12 to 18.
- Lead a week-long canoeing trip with a program dedicated to making the outdoors more diverse and financially accessible.

Dining Hall Worker, Carleton College

(September 2020 - March 2021)

Publications/Preprints

A. Pattison and N. Hopper. "Committee Moderation on Encrypted Messaging Platforms". In: 44th IEEE Symposium on Security and Privacy. Peer-reviewed poster. May 2023. URL: https://arxiv.org/abs/2306.01241

A. Pattison and N. Hopper. Threshold Content Reporting for Encrypted Messages. Submitting to CCS 2024.

A. Hong, S. Boliou, C. Roslansky, A. Pattison, and D. Liben-Nowell. *The Examplar Problem.* In progress, submitting Spring 2024.

AWARDS

Phi Beta Kappa, 2023 (one of nine Junior-year inductees, roughly 2 percent of the class)

Dean's List, 2023, 2022, 2021 (awarded to top 10 percent of class by GPA)

National Merit Scholarship, 2020 (awarded to roughly the top 1 percent of high-school seniors in the U.S.)

PROJECTS —	
Ole or Carl?	• alipatti/ole-or-carl
- This project tests the validity of a long-standing stereotype that studer different. If so, then a machine learning model should be able to tell	
- Uses a linear support-vector classifier on embeddings of student's fac	es taken from directory photos.
Wordle Bot	🔾 alipatti/wordle-bot 🗞
- A Python and NumPy implementation, of 3Blue1Brown's informatio - Wins in ~ 3.5 moves on average.	n-theoretic Wordle bot, with a few improvements
In Passing	🔾 alipatti/in-passing 🗞
- A visualization of passing and touch data from the 2022 FIFA Men's	World Cup, built with d3.js.
TODO.swift	$oldsymbol{\Omega}$ alipatti/todo.swift $ullet$
 A command line app to view and add to your Apple reminders, write Directly updates Apple's iCloud database, so changes are reflected in 	
An Introduction to Algebraic Number Theory	$oldsymbol{igcap}$ alipatti/math-comps $oldsymbol{igcap}$
 A whirlwind introduction to number rings, number fields, the class g Written as a senior thesis for the Carleton math department. 	group, and Dirichlet's unit theorem.
OEIS.rs	$oldsymbol{\circ}$ alipatti/oeis. rs 🗞
 A terminal interface for the Online Encyclopedia of Integer Sequence Provides interactive and non-interactive CLI. 	es, written in Rust.
Carleton Course Classifier	$oldsymbol{\circ}$ alipatti/course-classifier $oldsymbol{\circ}$
- A Tensorflow language model that predicts a course's department an	d number given its description.
- Achieves 64% accuracy in a 54-class problem using a neural net and	the Stanford GloVe embeddings.
Smart Garage	🔾 alipatti/homekit-garage-door 🗞
- Uses an ESP32 microcontroller to integrate my parents' 40-year-old	garage door opener with Apple HomeKit.

SKILLS

Programming: Python, R, JavaScript, LATEX, Rust, Java, SQL, git, Docker, Swift.

Web Development: Typescript, React, Next.js, Prisma.

Data Science: R (tidyverse, ggplot2), Python (NumPy, pandas, Matplotlib), SQL.

Machine Learning: TensorFlow, scikit-learn.

Data Visualization: ggplot2, matplotlib, d3.js.

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Coursework

Math: algebra, analysis, combinatorics, topology, analytic and algebraic number theory, representation theory, and Galois theory.

Computer science: algorithms, data structures, cryptography, artificial intelligence, natural language processing, and quantum computing.

Statistics: probability, regression, time-series analysis, machine learning, data science, and data visualization.

Personal Interests —
Running, the Minnesota Timberwolves, the Premier League, backpacking, photography, playing the piano, Nordic skiing, Wii Mario Kart, tomfoolery.