Alistair Pattison

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Education

Bachelors of Arts, Mathematics & Statistics, *Carleton College* *(September 2020 – June 2024)*

- 3.99 GPA, captain of varsity track and field.
- Studied abroad at the University of Cambridge taking classes in cryptography, WWII history, and the history of computing.
- Math coursework in algebra, analysis, combinatorics, and analytic number theory.
- Computer science coursework in algorithms, cryptography, artificial intelligence, and quantum computing.
- Statistics coursework in probability, regression, time-series analysis, data science, and data visualization.

Work Experience

Research Assistant, *University of Minnesota* *(September 2022 – August 2023)*

- Developed a method for reporting abuse on encrypted messaging platforms that provably maintains privacy until certain thresholds are met, e.g., if a user is reported enough times or by enough people.
- Wrote and benchmarked a proof-of-concept implementation in Rust.
- Presented findings at a peer-reviewed security conference and gave talks at weekly lab seminars.

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 include algorithms, real analysis, abstract algebra, data visualization, artificial intelligence, and calculus.

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 BOLD, a program dedicated to making the outdoors more diverse and accessible.

Dining Hall Worker, *Carleton College* *(September 2020 – March 2021)*

Publications

Alistair Pattison and Nicholas Hopper. "Committee Moderation on Encrypted Messaging Platforms". In: *44th IEEE Symposium on Security and Privacy.* Poster. May 2023. URL: https://arxiv.org/abs/2306.01241

Awards

Phi Beta Kappa, *2023*
Dean's List, *2023, 2022, 2021*
James F. Koehler Scholarship, *2022*
National Merit Scholarship, *2020*

Projects

Ole or Carl? 🐙 *alipatti/oleorcarl* 🔗

- This project tests the validity of a long-standing stereotype that students from Northfield's two colleges look meaningfully different. If so, then a machine learning model should be able to tell them apart? Right?
- Uses an SVM classifier on embeddings of student's faces taken from directory photos.

Carleton Course Classifier $\bigcirc$ *alipatti/course-classifier* ✂

- A Tensorflow language model that predicts a course's department and number given its description.
- Achieves 64% accuracy in a 54-class problem using a neural net and the Stanford GloVe embeddings.

Wordle Bot $\bigcirc$ *alipatti/wordle-bot* ✂

- A NumPy implementation, of 3Blue1Brown's information-theoretic Wordle bot, with a few performance improvements.

In Passing $\bigcirc$ *alipatti/in-passing* ✂

- A visualization of passing and touch data from the 2022 FIFA Men's World Cup, built with d3.js.

Skills

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

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

Data Science: NumPy, dplyr, pandas, Matplotlib, ggplot2, tidyverse, SQL.

Machine Learning: TensorFlow, vector embeddings, SVMs, scikit-learn.

Data Visualization: ggplot2, matplotlib, d3.js.