

# Oliver A. Calder

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## EDUCATION

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### **B.A., Carleton College**

2022

*Distinction in Mathematics, Computer Science*

*Northfield, MN*

Cum Laude, GPA: 3.85

## WORK EXPERIENCE

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### **Firmware Engineer**

July 2022 – Present

*Seagate Technology*

*Shakopee, MN*

- Wrote and debugged firmware in C and ARM assembly for next-generation dual-actuator enterprise hard drives.
- Worked with UDS dumps and hardware emulators to identify, understand, and solve firmware problems.
- Projects include implementing a data transfer client which leverages new hardware to increase the speed of large data copies between actuators and writing a modeling simulation from scratch in Rust to develop better strategies for disc scanning to ensure data integrity for users while providing fast and consistent performance.

### **Software Engineering Intern**

June – August 2021

*Hewlett Packard Enterprise (Cray HPC)*

*Bloomington, MN*

- Built and released software security updates for the Cray XCCS line of supercomputers.
- Wrote scripts to identify unpatched security vulnerabilities and create reports to allow the team to respond more quickly to customer needs.

### **Data Research Assistant**

December 2019 – January 2020

*Minnetronix, Inc.*

*St. Paul, MN*

- Wrote automation scripts to speed up the processes of data, file, and spreadsheet management and verification.
- Tools I created have helped the Minnetronix Neuro team to ramp up the volume of data they can accept and allocate, enabling a shift towards big-data analysis for machine learning.

### **Computer Science Teaching Assistant and Grader**

September 2019 – June 2022

*Carleton College*

*Northfield, MN*

- Worked with and mentored students, communicating new concepts in a way which built on their current understanding and reinforced the underlying logic behind computer hardware and software.
- Guided students through debugging their own code, and encouraged efficient and consistent solutions to problems.
- See below for course information.

## RESEARCH EXPERIENCE

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### Senior Thesis, Mathematics

September 2021 – March 2022

*Carleton College*

*Northfield, MN*

#### Detecting Gerrymandering in Redistricting Plans

*With Eva Airoidi, Antonia Ritter, Tom Patterson, and Bekka Stein*

*Advised by Deanna Haunsperger*

Analyzed and modeled congressional redistricting maps and developed tools to detect and measure Gerrymandering.

Paper: [calder.dev/Ensemble\\_Analysis\\_Gerrymandering\\_Paper.pdf](https://calder.dev/Ensemble_Analysis_Gerrymandering_Paper.pdf)

Presentation: [calder.dev/Ensemble\\_Analysis\\_Gerrymandering\\_Presentation.pdf](https://calder.dev/Ensemble_Analysis_Gerrymandering_Presentation.pdf)

Code: [github.com/olivercalder/gerrymandering](https://github.com/olivercalder/gerrymandering)

### Senior Thesis, Computer Science

September 2021 – March 2022

*Carleton College*

*Northfield, MN*

#### Replicating Security Attacks: DHT Crawler

*With Peter McCrea, advised by Jeff Ondich*

Implemented a BitTorrent DHT client from scratch to scrape the distributed hash table for sensitive metadata.

[github.com/olivercalder/dht-crawler](https://github.com/olivercalder/dht-crawler)

### Exploratory Operating Systems

June – September 2020, December 2021

*Carleton College*

*Northfield, MN*

*Advised by Aaron W. Bauer*

Created and benchmarked a minimal OS kernel in Rust for use in serverless computing environments, and wrote a PNG thumbnail generator from scratch as a model workload for the benchmarks.

[github.com/olivercalder/rust-kernel](https://github.com/olivercalder/rust-kernel)

[github.com/olivercalder/kernel-benchmark](https://github.com/olivercalder/kernel-benchmark)

[github.com/olivercalder/rusty-nail](https://github.com/olivercalder/rusty-nail)

### Sonic Signatures

June 2019 – June 2020

*Carleton College*

*Northfield, MN*

*Advised by Eric Alexander*

Wrote modular, concurrent Python scripts to extract phoneme data from Shakespeare plays and train machine learning models to identify characters based on the sound of their speech.

[github.com/olivercalder/sonic-signatures](https://github.com/olivercalder/sonic-signatures)

[github.com/olivercalder/character-text-pipeline](https://github.com/olivercalder/character-text-pipeline)

## TEACHING EXPERIENCE

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### TA: CS 111 Intro to Computer Science

W'21

*Computer Science Department, Carleton College*

*Northfield, MN*

### TA: CS 201 Data Structures

F'19, W'20

*Computer Science Department, Carleton College*

*Northfield, MN*

<b>TA: CS 208 Intro to Computer Systems</b> <i>Computer Science Department, Carleton College</i>	S'20, F'20, S'21, F'21, S'22 Northfield, MN
<b>Grader: CS 358 Quantum Computing</b> <i>Computer Science Department, Carleton College</i>	W'22 Northfield, MN

## AWARDS AND FUNDING

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<b>David Pollatsek '96 Prize in Computer Science</b> <i>Carleton College</i>	2022 Northfield, MN
<b>Distinction in Mathematics</b> <i>Carleton College</i>	2022 Northfield, MN
<b>Sigma Xi</b> <i>Carleton College</i>	2022 Northfield, MN
<b>Towsley Endowment Research Scholarship</b> <i>Carleton College</i>	2019, 2021 Northfield, MN
<b>Exemplary Rating, Writing Portfolio</b> <i>Carleton College</i>	2020 Northfield, MN

## VOLUNTEERING

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<b>Director, Pied Pipers (Chamber Orchestra)</b> <i>Carleton College</i>	Fall 2021 – Spring 2022 Northfield, MN
<b>IT Engineer, KRLX 88.1 FM</b> <i>Carleton College</i>	Spring 2019 – Winter 2022 Northfield, MN

## SKILLS

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### Languages

- **Expert:** C, Python
- **Skilled:** Bash/Bourne Shell, Java, Rust, Scheme
- **Familiar:** Go, JavaScript, SQL, Assembly

### Linux

- 4+ years full-time use
- Worked on security releases based on SLES
- Professional workstation and server administration
- In-depth experience with installation, package management, backup and recovery, ssh and remote management, container administration, networking and firewalls, web servers and proxies, databases, filesystem management

### Experience

- AI, Automation, communication, computational mathematics, concurrency, data visualization, databases, filesystems, firmware, gdb, git, high-performance computing, Jenkins, Jira, LaTeX, machine learning, OpenGL, optimization, OS kernel development, parallel computing, systems administration, technical writing, vim, virtualization, UDS, unikernels

## RELEVANT COURSEWORK

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- AI (CS 321)
- Abstract Algebra (MATH 342)
- Algorithms (CS 252)
- Advanced Algorithms (CS 352)
- Combinatorial Theory (MATH 333)
- Computability and Complexity (CS 254)
- Computational Mathematics (MATH 271)
- Computer Systems (CS 208)
- Computer Graphics (CS 311)
- Data Structures (CS 201)
- Generative Approaches to Syntax (LING 216)
- Linear Algebra (MATH 232)
- Mathematical Structures (MATH 236)
- Multivariable Calculus (MATH 211)
- Operating Systems (CS 332)
- Ordinary Differential Equations (MATH 241)
- Probability (MATH 240)
- Programming Languages (CS 251)
- Quantum Computing (CS 358)
- Software Design (CS 257)