Oliver A. Calder

952-454-6850 | oliver@calder.dev

Education

B.A., Carleton College 2022
Distinction in Mathematics, Computer Science *Northfield, MN*
Cum Laude, GPA: 3.85

Work Experience

Firmware Engineer July 2022 – Present
Seagate Technology *Shakopee, MN*

- Wrote and debugged firmware for next-generation dual-actuator enterprise hard drives.
- Worked in C and ARM assembly, using UDS dumps and hardware emulators to identify, understand, and solve firmware problems.
- Projects include working with cross-actuator communication and implementing a data transfer client which leverages new hardware to increase the speed of large data copies.

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

Senior Thesis, Mathematics September 2021 – March 2022
Carleton College *Northfield, MN*

Detecting Gerrymandering in Redistricting Plans
With Eva Airoldi, 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`
Presentation: `calder.dev/Ensemble_Analysis_Gerrymandering_Presentation.pdf`
Code: `github.com/olivercalder/gerrymanderingComps`

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`

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`
`github.com/olivercalder/kernel-benchmark`
`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`
`github.com/olivercalder/character-text-pipeline`

Teaching Experience

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*

TA: CS 208 Intro to Computer Systems S'20, F'20, S'21, F'21, S'22
Computer Science Department, Carleton College *Northfield, MN*

Grader: CS 358 Quantum Computing W'22
Computer Science Department, Carleton College *Northfield, MN*

Awards and Funding

David Pollatsek '96 Prize in Computer Science 2022
Carleton College *Northfield, MN*

Distinction in Mathematics 2022
Carleton College *Northfield, MN*

Sigma Xi 2022
Carleton College *Northfield, MN*

Towsley Endowment Research Scholarship 2019, 2021
Carleton College *Northfield, MN*

Exemplary Rating, Writing Portfolio 2020
Carleton College *Northfield, MN*

Volunteering

Director, Pied Pipers (Chamber Orchestra) Fall 2021 – Spring 2022
Carleton College *Northfield, MN*

IT Engineer, KRLX 88.1 FM Spring 2019 – Winter 2022
Carleton College *Northfield, MN*

Skills

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

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

Relevant Coursework

- 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 258)
- Software Design (CS 257)