

# Max Heller

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## Experience

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### MIT Lincoln Laboratory

ASSISTANT STAFF - ENGINEERING

Lexington, MA

Apr. 2023 – Present

- Building secure-by-design prototypes for satellite flight software platforms and operating systems in Rust
- Developed an async runtime with an embassy-based executor and a mio-based reactor to add async/await support for flight software applications
- Optimized pub/sub message-passing bus central to flight software platform

### Jane Street

SOFTWARE ENGINEER INTERN

New York, NY

May – Aug. 2022

- Developed a modular language server in OCaml providing code completion, validation, and navigation functionality for configuration files
- Integrated distributed tracing of remote procedure calls into an internal application framework

### Amazon Web Services

APPLIED SCIENTIST INTERN – AUTOMATED REASONING GROUP

New York, NY

May – Aug. 2021

- Developed an intermediate representation for SMT-LIB formulas in Rust used by several internal projects and released as open source
- Implemented an eager SAT encoding for a linear integer arithmetic subset of SMT-LIB resulting in completion of 15-20% more job scheduling benchmarks than state-of-the-art SMT solvers when combined with a distributed SAT solver backend

### The D. E. Shaw Group

SYSTEMS TECHNOLOGIST INTERN

New York, NY

May – Dec. 2020

- Built a Kerberos Credential Manager in Rust (with tokio-based async) to restrict access to user secrets and facilitate more precise access control
- Developed a library (srv-rs) to facilitate communication with services located by DNS SRV records
- Planned and led three hour-long Rust trainings for ~50 full-time engineers and interns

## Education

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### Brown University

SC.B. IN COMPUTER SCIENCE · 4.0 GPA · SENIOR PRIZE IN COMPUTER SCIENCE

Providence, RI

December 2022

- Coursework in systems, security and privacy, programming languages, formal methods, and logic

## Projects

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### Dropbox

Designed and implemented a secure file sharing service on an untrusted server as a group project for CSCI 1660: Computer Systems Security

### TCP/IP

Implemented a TCP/IP stack in Rust with TCP Reno congestion control as a group project for CSCI 1680: Computer Networks

### Weenix

Built an OS kernel in C with a scheduler, TTY driver, file system (S5FS), and virtual memory for CSCI 1690: Operating Systems Lab

### CDCL SAT Solver

Developed a conflict-driven clause learning satisfiability solver in Rust implementing watched literals, VSIDS, and Luby-based restarts

## Teaching

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### Head Teaching Assistant, PRESCRIPTIVE ANALYTICS · COMPILERS · ACCELERATED INTRO CS

- Hired and managed TAs, developed and managed course assignments and infrastructure, held office hours, graded student assignments

## Activities

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### Meet Director, BROWN RUNNING CLUB · NATIONAL INTERCOLLEGIATE RUNNING CLUB ASSOCIATION

- Planned and directed several 250-400+ participant track and cross country meets for collegiate running clubs and USATF athletes

## Skills

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Rust · OCaml · TypeScript · Python · Go · C · SQL · Git · AWS · GCP · Alloy Analyzer