

# Kelton OBrien

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## Education

**Université Paris Cité** Fall 2024-Spring 2025 *MPRI Master's in Computer Science Research*

- Attending the MPRI (Master Parisien de Recherche en Informatique) program in Paris as an M2 (second year Master's) student.
- MPRI is administered by several universities in Paris (ENS, ENS-PL, ...) see this link for more information on the program.

**University Of Minnesota, Twin Cities** *GPA:3.95/4.00 TGPA:3.92/4.00* Fall 2019-Spring 2024, *4 Majors, see below.*

- Received a B.S with majors in Computer Science and Linguistics, and a B.A with majors in Philosophy and Mathematics.
- Attended the U of M full time throughout my senior year of high school through the PSEO program, largely taking computer science courses.
- Notable Coursework: Programming Languages, Dependent Type Theory, Honors Introduction to Topology, Algorithms and Data Structures, Formal Languages and Automata Theory, and Functional Algorithm Design with Haskell, Programming Language Theory.

**Minneapolis College** *GPA:4.00/4.00 TGPA:4.00/4.00* Fall 2018-Spring 2019

- Attended MC full time as a non-degree seeking student during junior year of high school through the PSEO program.

## Experience

**Minnesota Extensible Language Tools (MELT) research group**

Minneapolis, Minneapolis November 2020-Present *Undergraduate Researcher*

- I worked researching parsing theory and adding counterexamples for ambiguous or non-LALR grammars to the copper parser generator.
- I currently work on the silver attribute grammar programming language. I am currently adding support for polymorphic concrete syntax.

**Microsoft Research**

Redmond, Washington May 2023-August 2023 *Research Intern*

- I worked on TLA<sup>+</sup>, a temporal logic based specification language, adding support for the verification of statistical properties.

**CMU Program Analysis, Software Testing, and Applications (PASTA) research group**

Pittsburgh, Pennsylvania May 2022-August 2022 *Undergraduate Researcher*

- I worked on optimizing Mu2, a JVM Mutation-Testing based fuzzer.
- The project is an extension of the JQF+Zest fuzzing framework, which is a fuzzing engine which takes a semantic approach to input generation, mutating a series of bits which is fed to a quickcheck-style structured input generator instead of the input directly.

**University of Minnesota Twin Cities Computer Science and Engineering Department**

Minneapolis, Minnesota January 2021-December 2022 *Teaching Assistant*

- I last TA'd for CSCI 2041, a class that teaches functional programming in OCaml, and formal reasoning about functional programs.
- I Previously TA'd for CSCI 2021, a class that teaches low level machine architecture, including programming in C and x86\_64 assembly.

**University of Minnesota Twin Cities School of Mathematics**

Minneapolis, Minnesota January 2021-April 2022 *Student Developer*

- I helped develop doenet, distributed open-source education software
- My work focused on the programming language parts of the project – I developed the text editor, parsing of the project's bespoke mark up language, doenetML, as well as working on the semantics.

## Publications

Vasudev Vikram, Isabella Laybourn, Ao Li, Nicole Nair, **Kelton OBrien**, Raffaello Sanna, and Rohan Padhye. 2023. Guiding Greybox Fuzzing with Mutation Testing. In *Proceedings of the 32nd ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA '23)*, July 17–21, 2023, Seattle, WA, United States. ACM, New York, NY, USA, 13 pages. <https://doi.org/10.1145/3597926.3598107> **Distinguished paper award!**

## Skills

Programming Languages: Agda, Haskell, OCaml, Rust, Python, C, Java, Typescript, Javascript, Coq

Tools/Frameworks: Linux, Cubical Agda, Flask, Git, Nix, React, Recoil, MTL, L<sup>A</sup>T<sub>E</sub>X, GDB, NGINX.

Human Languages: English (Native), Swedish (A1-A2), German (B1), French (A1)

## Extracurriculars

### ACM UMN (Vice-President)

2020-2022, 2023-2024

After hitting the term limit for being club president set out by the ACM UMN constitution, I ran for Vice-President to keep an important leadership in the club. I host a paper reading group, classes to teach new students about unix, seminars on programming language implementation, L<sup>A</sup>T<sub>E</sub>X tutorials, and other various educational events. I also help with the organization & management of the club, running events (including MinneHack, the largest hackathon in minnesota), and helping train and advise the new group of officers who will be running the club when I graduate. I am the main organizer for the ACM UMN CTF (capture the flag), where I write most of the challenges.

### ACM UMN (President)

2022-2023

While serving for president for 2 terms, I did all of the things listed as what I do as vice president, but more of it and with greater responsibilities. I was organizer of MinneHack 2023, where I secured all corporate sponsorship's, developed the prompt, organized the schedule, organized the budget, etc. I was the sole organizer for most of our events in my term as president, and so on.

### ACM UMN (Treasurer)

2019-2020

### Programming Languages Seminar

2019-Present

I am a member of the Programming Languages Seminar, a reading group consisting mostly of graduate students researching programming languages. We've covered several courses worth of material with the books and papers we've discussed.

## Awards & Achievements

### Deans List, University of Minnesota

2019, 2020, 2021, 2022, 2023, 2024

### Deans List, Minneapolis College

2018, 2019

### 1st Place, U of M Software Design Competition

2019

### Amateur Radio Extra-Class License

2024