Oliver Soeser

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About

I am a student passionate about programming language research with a strong academic background in Computer Science and Mathematics at the University of Edinburgh. Through hands-on research experience and projects building experimental languages, I have developed a deep appreciation for compilers, formal methods, and type systems. I am driven by my curiosity and desire to make an impact pushing programming languages forwards.

Experience

Scientific Intern *June 2025 – August 2025*
Programming Languages and Verification Group,
Institute of Science and Technology Austria
Supervisor: Prof. Michael Sammler

- Modified the compilation process of the Lean theorem prover, utilising its unique metaprogramming features.
- Expanded the language syntax and reasoning capabilities for formal correctness proofs of computer programs using concurrent separation logic.
- Studied cutting-edge programming languages research and presented findings to the group.
- Coordinated with programming language researchers world-wide, developing crucial communication skills.

Teaching Support Provider *September 2024 – Current*
School of Informatics, The University of Edinburgh

- **Teaching Assistant** for *Introduction to Computation*, administrating automated systems for marking functional programming coursework and maintaining course materials for Haskell and computational logic.
- **Lab Demonstrator** for *Introduction to Algorithms and Data Structures*, instructing students in effective problem solving approaches using algorithms.
- **Tutor** and **Marker** for *Object Oriented Programming*, running weekly tutorials teaching Java programming as well as good coding practices.

Education

The University of Edinburgh *September 2023 – May 2027*
Computer Science and Mathematics (BSc Hons)

- Dedicated student consistently achieving top marks.
- Engaging with the programming languages research community, attending talks, workshops, and seminars.
- Courses this year include *Compiling Techniques*, *Elements of Programming Languages*, and *Algorithms and Data Structures*.

Brockenhurst College *January 2022 – June 2023*
A Levels: Mathematics (A), Computer Science (A*), and Politics (A*)*

Projects

Iris-Lean *GitHub*

- Contributing to an implementation of the Iris concurrent separation logic framework in Lean 4.
- Building tools to enable reasoning about program safety and correctness using metaprogramming.
- Implemented the crucial irevert and iapply tactics, simplifying the use of theorems representing the state of program resources, including ownership.

Asymptotic

- A work-in-progress minimalist programming language written in C.
- Builds on concepts from Andrew W. Appel's *Modern Compiler Implementation in C*.
- Goal is an easy-to-use REPL for symbolic computation applicable to solving problems in computer science, such as automatically finding asymptotic solutions to recurrence relations.

Appendix A: Skills

Technologies: C, Java, Lean 4, Haskell, Python, TypeScript, LaTeX
Languages: English (C2), German (native)

Appendix B: Academic Record

Course	Mark	Grade
Introduction to Algorithms and Data Structures	80	A
Fundamentals of Pure Mathematics	84	A
Foundations of Data Science	81	A
Statistics	74	A
Computing and Numerics	73	A
Probability	95	A
Facets of Mathematics	84	A
Several Variable Calculus and Differential Equations	79	A
Calculus and its Applications	88	A
Proofs and Problem Solving	85	A
Object Oriented Programming	94	A
Philosophy of Science	67	B
Introduction to Linear Algebra	97	A
Introduction to Computation	100	A

This academic year, I am taking *Algorithms and Data Structures*, *Combinatorics and Graph Theory*, *Compiling Techniques*, *Elements of Programming Languages*, *Honours Algebra*, *Honours Complex Variables*, *Informatics Large Practical*, and *Introduction to Theoretical Computer Science*.