Oliver Soeser

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Experience

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

I am part of the course teams for the Introduction to Computation and Object Oriented Programming courses at Edinburgh University. I have listed some of my responsibilities for each course below.

Introduction to Computation (Tutor and Marker):

- Run tutorials teaching functional programming in Haskell and computational logic, such as finite state machines and the sequent calculus.
- Mark and give feedback on students' coursework, guiding progress in their studies.
- Support students with queries about course content, both in tutorials and the course's online forum.

Object Oriented Programming (Tutor, Demonstrator, and Marker):

- Run lab sessions for students to develop their Java programming skills.
- Support students with questions regarding the course content and coursework.
- Offer guidance for students struggling with the course.

Education

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

I am a dedicated student with consistently outstanding academic performance (see second page). I also engage with the university community in a number of ways:

- Active in TypeSig, the type theory special interest group, with an interest in the formalisation of the foundations of theoretical computer science.
- Working on computer-verifiable proofs of undergraduate mathematical theorems in the Lean interactive theorem prover.
- Class representative on the Staff-Student Liaison Committee.

Brockenhurst College *January 2022 – June 2023*
A Levels

Mathematics (A*), Computer Science (A*), and Politics (A*).

Projects

Data Visualisation Engine *Web Demo*

A data visualisation tool written in pure TypeScript creating intelligent layouts for network graphs, using a physics-based drawing algorithm. The demo uses Edinburgh University course data processed using Python.

Euclid Animated *GitHub Repository*

A custom Python package extending the Manim animation library to create illustrations explaining and demonstrating postulates from Euclid's Elements, based on Oliver Byrne's colourful edition.

Skills

Languages: English (C2), German (native)

Technologies: Python, C, C++, Java, Haskell, Lean 4, JavaScript, TypeScript

Volunteering

Counting Agent *4 – 5 July 2024*

Appointed counting agent at the City of Edinburgh's 2024 UK General Election count.

Appendix A: Academic Record

Course	Mark	Grade
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

I am currently taking *Introduction to Algorithms and Data Structures*, *Foundations of Data Science*, *Computing and Numerics*, *Statistics*, and *Fundamentals of Pure Mathematics*.

Appendix B: Research Interests

My primary research interests lie at the intersection of **formal verification** and **automated reasoning**, with a focus on the **program synthesis** and **formalised mathematics**. I am particularly interested in leveraging **formal methods** to enhance the correctness and reliability of programs and proofs created by **generative artificial intelligence**, ensuring that we can harness the power of LLMs without sacrificing rigour.

I am especially keen to explore how formal methods and type systems can strengthen the reasoning capabilities of LLM-based program synthesis and improve their reliability in complex tasks. Through this internship, I hope to be able to contribute to the advancement of these fields that I am deeply passionate about.