

# Zac Garby

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## Academic

### University of Nottingham

PhD Student, Functional Programming

2023—present

Supervised by Professor Graham Hutton in the **Functional Programming Lab**.

My main interests are **program calculation**, automated **program synthesis**, and interactive programming paradigms, as well as combining these for “friendly”, effective programming experiences.

Published “*Calculating Compilers Effectively*”, in the *Haskell Symposium* 2024.

### University of Nottingham

MSci, Computer Science

2019—2023

**First Class Honours** (87% average, awarded the **best overall** performance prize)

Achieved the **highest ever grade** in Computer Science at the University.

Two dissertations (years 3 & 4). Awarded the **best dissertation prize** for both:

*Fantasia*: Synthesising Recursive Functions Without Trace-complete Examples

*Fugue*: A Friendly Functional Programming Language with Holes

### The Thomas Hardy School, Dorchester

2015—2019

Four A-levels: Maths, Further Maths, Computer Science, and Physics (**A\*AAA**)

## Volunteering

### Hackathons UK

2024—present

A member of a core team at Hackathons UK—a UK **charity**—supporting university students in organising and hosting hackathons across the country.

### HackSoc (University of Nottingham Students' Union)

2021—2023

**President**, and **lead organiser** of HackNotts; previously other committee roles.

Full responsibility for the society. Substantially **improved society engagement** and community. Gave **talks** and delivered **workshops**. Handled budget, logistics, and on-the-day activities for a 200-person event.

### Intl. Conference on Functional Programming, student volunteer

2024

### University of Nottingham, computer science mentor

2020—2021

### Thomas Hardy School, founded programming club

2017—2019

### Thomas Hardy School, taught robotics STEM days

2017—2019

## Achievements & Recognition

**Journal of Functional Programming**, reviewed a special issue article 2024

**YouTube**, approx 50k views on my *Computerphile* video 2024

**University of Nottingham FP lab representative**

2023—present

### University of Nottingham

2019—2024

- Elizabeth and J D Marsden prize 2023
- Outstanding community contribution prize 2023
- Best overall performance (over four years) 2019—2023
- High achiever's award (top 5% each year) 2020, 2021, 2022, 2023
- Best year 4 research project 2023
- Best year 3 dissertation 2022
- Awarded “silver” scholarship 2019

**UKMT**, Silver award, senior mathematical challenge

2018

## Links

[github.com/zac-garby](https://github.com/zac-garby), [devpost.com/zac-garby](https://devpost.com/zac-garby), [youtube.com/@zacmg](https://youtube.com/@zacmg)

## Skills

**Haskell, Python, Go, TypeScript, Java, C,  $\text{\LaTeX}$ , Agda, Swift, Rust, C#, HTML, CSS.**

**Compilers & programming languages.**

**Web and backend**, server management, and networking. **Media** (audio, games, graphics, computer vision), electronics, low level systems, & mixed reality. **LLMs** and AI integration/programming.

Category theory, type theory, abstract algebra, formal logic and proofs, semantics & domain theory.

**Public speaking, leadership**, event planning, logistics, finance. **Teaching** and engaging a wide range of audiences. Graphics and design. Trained first aider.

## Publications

### *Calculating Compilers Effectively*

Zac Garby, Graham Hutton, and Patrick Bahr

In Proceedings of the 17th ACM SIGPLAN International Haskell Symposium (Haskell '24), September 6–7, 2024.

## Interests

**Interactive programming, program synthesis**, experimental programming paradigms, and compilers.

Computer science **community engagement**, education, and outreach.

Playing music, reading, climbing and running, cooking and baking. A training officer at medieval combat society.

## Conferences

- Haskell Symposium, 2024
- ICFP, 2024
- Midlands Graduate School, 2024
- Midlands Graduate School, 2022

## Hackathons

- **AstonHack 9**, 2024, 2nd place
- **HackSussex**, 2024, 1st place
- **Royal Hackaway v7**, 2024, 1st place
- **HackSussex**, 2023, 1st place
- **HackNotts**, 2023, lead organiser
- **OxfordHack**, 2022, sponsor prize
- **HackNotts**, 2022, an organiser
- **AstonHack7**, 2021, 1st place + &c.
- **HackNotts**, 2020, sponsor prize
- Full portfolio [on my website](#)