Zac Garby

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Education

2019-present **University of Nottingham**
MSci Computer Science

Year 3: In progress
Dissertation *"Fugue, a Friendly Functional Programming Language with Holes."*
I designed and implemented a functional programming language, named Fugue, with a novel type system based on Hindley-Milner. The language compiles to an enhanced lambda calculus, and supports interactive programming to an extent using holes, and I devised a heuristic for suggesting and prioritising possible hole fills.

Year 2: First (87%)
Software Engineering Group Project *"Surreal Numbers and Games."*
Using Haskell, we explored the usage of John Conway's surreal number system for general game-playing AI to produce a program that could perform well against human players even on games it had never seen. Specifically, it worked with 2-player perfect information games, and included a Haskell API for users to define their own games.

Algorithms, Correctness & Efficiency: 92%	Advanced Functional Programming: 87%
Operating Systems & Concurrency: 89%	Introduction to Image Processing: 81%
Languages and Computation: 86%	Artificial Intelligence Methods: 80%
Developing Maintainable Software: 86%	Software Engineering Group Project: 89%

Year 1: First (91%)

Mathematics for Computer Scientists: 97%	Introduction to Software Engineering: 88%
Programming & Algorithms: 96%	Databases & Interfaces: 93%
Systems & Architecture: 90%	Fundamentals of Artificial Intelligence: 81%
Computer Fundamentals: 90%	Programming Paradigms: 88%

2015-2019 **The Thomas Hardye School, Dorchester**
A-Levels
Mathematics: *A**; Further Mathematics, Computer Science, and Physics: *A*

Experience

2022-present President, HackSoc Nottingham
- I am responsible for the society, including high-level organisation and planning, and its reputation.
- I give talks and workshops, and have retained my Graphics Officer duties.

2021-present Lead organiser for HackNotts, HackSoc's annual hackathon.
- I am responsible for the graphics, web development, logistics, finance, and general planning of the event.

2021-2022 Development Secretary and Graphics Officer, HackSoc Nottingham
- I give a number of workshops and talks on tech-related topics each month.
- I maintain the society's website and graphics.

2020-2021 A Computer Science mentor at the University of Nottingham.
- I was assigned to a small group of first-year students to help them settle in to University.

- I ran a number of sessions with my group to help them with their first-year modules.

2018 Took part in the National Citizen Service.
- As part of a team, we raised money and restored a youth centre in Dorchester.

2017-2019 Ran the Programming & Robotics club at the Thomas Hardye School.
- We taught a group of year 9 and GCSE students about programming, mainly through the context of robotics.

2017-2019 Volunteered at a number of STEM days throughout high school.
- We ran half-day sessions teaching middle school students about programming and simple robotics using LEGO Mindstorm.

Skills & Interests

- Extensive experience in Haskell (6 years), Python (10 years), C, Java, Go, JavaScript, Agda, Lean, and LaTeX.
- Strong interest in many areas related to programming language theory, including type theory and compiler design/implementation.
- Experience with scientific and statistical computing in Python and MATLAB, web development (frontend and backend), networking and server management, multimedia (image processing, audio processing/synthesis, game development, mixed reality), and the design and implementation of programming languages.
- Interest in hackathons, both as an attendee and as an organiser.
- Very interested in all kinds of mathematics; I enjoy solving mathematical puzzles and problems.
- I enjoy playing, listening to, and writing music, and have been learning the guitar and the piano for several years.
- I'm a member of the University of Nottingham's Medieval Combat Society, and have been for three years.

Awards & Achievements

2021 First prize for my project, "Network over Rube Goldberg Machine", at AstonHack 2021.

2020 Received a sponsored prize for my project, "The Haskelltron 2000", at HackNotts 2020.

2019 Received a silver scholarship (a 25% tuition fee rebate each year) from the University of Nottingham's School of Computer Science.

2019 Was selected by my school to create an interactive exhibit for the local "50th Anniversary of the Moon Landing" event.

2019 Received my school's first ever Computer Science subject award.

2018 Received a silver award in the UKMT Senior Mathematical Challenge.

2015 Second place out of hundreds of entries in a STEM competition at Bournemouth University.

2013 First place in a poster design contest with the Dorchester Police.

References

References are available on request.