

William Greenfield

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PROFILE

A motivated and analytical computer science student entering the third year of a BSc at the University of Southampton, with strong academic ability, exemplary work ethic and the tenacity to see things through. An enthusiastic problem solver, with good coding, verbal and written communication skills. A self-starter, operating well as a team player, whilst also having the ability to lead and make decisions.

PROJECTS

Neural Networks Research Project

- Self-directed extended project researching the mathematics underpinning neural networks; built a feed-forward network from scratch in Python using only NumPy for matrix operations, achieving 99% accuracy on the MNIST handwritten-digit dataset.
- Investigated the effect of activation functions, learning rate and network architecture on training convergence and accuracy.

AI Coursework: 5x5 Chess Engine

- Built a 5x5 chess engine in Python using bitboards and Zobrist hashing for fast move generation, position tracking and transposition detection.
- Implemented iterative-deepening minimax with alpha-beta pruning, quiescence search and move-ordering heuristics, allowing the engine to search significantly deeper within a fixed time budget.

Maze Solving Program

- Led a team to design and implement a maze solving program using graph theory to navigate and solve conventional and unconventional mazes.
- Used Python cv2 library for image processing, A* search, breadth-first search (BFS) and depth-first search algorithms (DFS) to search the webcam input.

Web-Based Chess Platform

- Developed a web based two player chess game, using Flask and WebSockets interacting with the backend which provided user accounts, move validation utilising an Object-Oriented implementation of pieces.
- To allow for ease of use the web interface was built with similar features to popular existing chess platforms.

EXPERIENCE

Ibex.ai - Software & Data Engineering Intern

London, October 2022

AI and data-driven marketing platform

- Queried production databases and used data pipelines to extract and clean a customer dataset using Pandas, enabling downstream ML analysis.
- Trained and evaluated regression and classification models on Azure Databricks to model the correlation between marketing strategy and client response rates.

IoT.nxt - Data Analysis Intern

Gauteng, South Africa, July 2022

IoT solutions provider

- Extracted match performance statistics of provincial rugby players and analysed this data, preparing a report with findings.

Codehesion - Software Development Intern

Gauteng, South Africa, July 2022

Software development consultancy

- Supported a team developing a supply chain management system for a large high street retailer.
- Developing customer loyalty system for online gaming company.

TECHNICAL SKILLS

Programming

Python, Java, JavaScript, TypeScript, Haskell, C, SQL

Data & ML

Pandas, NumPy, PyTorch, TensorFlow, Azure Databricks

Web & Frameworks

React, Flask, HTML/CSS, WebSockets

Tools

Git, Linux, Bash scripting

EDUCATION

University of Southampton - BSc Computer Science

2024 – Present

Year 2 average: 65.1% (Upper Second) — Year 1 does not count towards the final degree classification

Year 2 Modules (2025 – 26) — Part average: 65.1

Code	Module	Mark	Topics covered
COMP2300	Software Design and Development Project	62	Team software project: stakeholder analysis, user stories, interface design, prototyping, testing and technical reporting.
COMP2311	Theory of Computing	58	Finite automata, regular expressions, context-free grammars, Turing machines and complexity.
COMP2312	Programming III	65	Haskell: type systems, higher-order functions, monads, lazy evaluation and lambda calculus; including building a regular expression interpreter and lambda calculus evaluator.
COMP2313	Formal Specification and Verification	71	Hoare logic and design by contract, program verification in Dafny and Rocq/Coq, automated theorem proving, model checking with LTL, Promela and SPIN.
COMP2321	Artificial Intelligence	86	Search (A*, minimax, alpha-beta), ML (decision trees, KNN, neural networks), Bayesian reasoning and logic.
COMP2322	Programming Language Concepts	72	Lexing, parsing, operational semantics, the Curry–Howard correspondence, labelled transition systems and concurrency (locks, coroutines, futures and promises).
COMP2323	Computer Systems II	45	Embedded systems: interrupt-driven event design, memory-mapped I/O registers, real-time scheduling, RIOS multitasking, watchdog fault recovery and FAT file systems.

Year 1 Modules (does not count towards the final classification) — Average: 70

Code	Module	Mark	Topics covered
COMP1300	Part I Lab Programme	71	Lab programme including a technical report and group presentation.
COMP1311	Mathematics I	70	Logic, set theory, relations, proof techniques and combinatorics.
COMP1312	Programming I	77	Systems programming in C: pointers, memory management, structs and file I/O. Python covered but already a primary language prior to university.
COMP1313	Computer Systems I	66	CPU architecture, ARM instruction sets, memory hierarchy, pipelining, OS fundamentals and virtualisation.
COMP1314	Data Management	70	Relational databases, SQL, schema design, normalisation, NoSQL and UNIX shell scripting; including normalising a dataset from XML through to 3NF in SQLite.
COMP1321	Mathematics II	64	Linear algebra, calculus, partial derivatives, statistics and hypothesis testing.
COMP1322	Programming II	77	OOP in Java: inheritance, polymorphism, interfaces, collections, UML and design patterns.
COMP1323	Networks and Security	60	TCP/IP, DNS, routing, CIA security triad, threat modelling and cryptography.
COMP1324	Algorithmics	73	Big-O analysis, sorting, trees, heaps, hash tables, graphs and dynamic programming.

Hampton School

Hanworth, London 2017 – 2024

A Levels (2024): Mathematics (A*), Further Mathematics (A), Computer Science (A), Physics (A)

GCSEs (2022):

Grade 9: Maths, Further Mathematics, Spanish, English Literature, Chemistry, Biology, Physics

Grade 8: Computer Science, Latin

Grade 7: History, English Language

AWARDS & ACHIEVEMENTS

1st Place, Cyber Security Society CTF - University of Southampton

May 2025

Ranked 1st in the society competition, capturing the most flags in a wide range of topics including Cryptography, Web Security, Reverse Engineering, Binary Exploitation, RFID Hacking and Reverse Protocol Engineering.

School Prefect. Founded and led Competitive Programming Club – Hampton School

2023/24

Duke of Edinburgh Silver Award

April 2022

VOLUNTEERING

Nkosi's Haven - Shelter for Mothers & Children Living with HIV

Johannesburg, August 2022

- Worked in day care centre for small children.
- Organised after school activities for school aged children.
- Kitchen work and meal preparation.