

# G McCaulay-Jones

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Final-year Computer Science and Mathematics (MComp) student at the University of Bath. Experienced in teamwork and leadership through group projects, esports team management, and customer service roles. Strong communication and problem-solving skills. Seeking mathematical software engineering and quantum computing opportunities.

## EDUCATION

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### University of Bath

September 2021 – July 2025

*Master of Computing in Computer Science and Mathematics with Honours (MComp)*

2:1

<b>Master's Research Project</b>	Investigated and devised novel applications of variational quantum algorithms for prime factorization in cryptographic contexts.
<b>Data Structures and Algorithms</b>	Studied data structures and algorithms covering complexity analysis, sorting techniques, and empirical assessments. Explored lists, stacks, queues, trees, hash tables, and graphs while evaluating efficiency trade-offs between algorithm performance and implementation overhead.
<b>Algebra</b>	Studied linear and abstract algebra, including sets, functions, polynomials, and matrices. Covered vector spaces, (multi)linear transformations, eigenvalues, inner products, and the spectral theorem. Explored groups, rings, fields, subgroups, homomorphisms, quotient structures, ideals, and factorization.
<b>Parallel Computing</b>	Studied parallel computing by writing and debugging programs. Examined concurrent data access and evaluated parallel hardware and programming methodologies. Analyzed performance metrics using Amdahl's and Gustafson's laws. Implemented shared memory and distributed systems with MPI, OpenMP, and synchronization constructs.
<b>Statistics for Data Science</b>	Studied statistics for data science covering probability laws, discrete and continuous variables, Bayes' Theorem, expectation, variance, and correlation. Examined conditional and marginal distributions, maximum likelihood estimation, hypothesis testing, and confidence intervals. Formulated decision problems to select decision rules and minimise cost/risk.
<b>Logic and Semantics of Programming Languages</b>	Studied mathematical theories for formal analysis of programming languages, including syntactic models like the simply-typed lambda calculus, semantic models such as cartesian closed categories and domains, and the application of logic in computation through the Curry-Howard isomorphism and program logics.
<b>Differential and Geometric Analysis</b>	Studied differential and geometric analysis, reviewing Frechet derivative, mean value inequality, contraction mapping theorem, proving inverse and implicit function theorems. Explored differential forms via wedge products, pullbacks, variable changes; applied integration techniques, matrix groups, Lagrange multipliers, and Stokes theorem.
<b>Other Relevant Modules</b>	Functional Programming, Differential and Geometric Analysis, Real and Complex Analysis, Number Theory, Logic and Semantics of Programming Languages, Machine Learning, Foundations of Computation, Graphs and Networks

## A- Levels

*The Warriner School*

Bloxham

2014 – 2021

- Further Mathematics (A\*), Mathematics (A\*), Physics (A\*), Computer Science (A)

## GCSEs

*The Warriner School*

Bloxham

2014 – 2019

- 9,9,9,8,8,7,6,6,6 In 9 subjects; including English and Maths
- Additional Mathematics (A) [FSMQ]

## TECHNICAL SKILLS

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**Languages:** Python, Java (Proficient); C, C++ (Intermediate); TypeScript, Haskell, Erlang, Bash (Familiar)

**Frameworks & Libraries:** Django, React Native, NumPy, Matplotlib, POSIX

**Tools & Platforms:** Git, Docker, Linux, Microsoft Office

## PROJECTS

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**Music Streaming Platform** | *React, Expo, Drizzle, Django, Python, TypeScript, Docker*

- Designed and implemented RESTful APIs and database schemas for a full-stack music service.
- Built client interfaces (React/Expo) in TypeScript and server-side logic (Django) in Python.
- Containerized micro-services with Docker.

**Interactive Unity Game** | *Unity, C#*

- Architected codebase and integrated hardware sensor inputs for novel fruit-based controllers.
- Developed object-oriented gameplay systems and optimised performance in a 24-hour hackathon.
- Collaborated cross-functionally to secure 2<sup>nd</sup> place in People's Vote, showcasing rapid prototyping and teamwork.

## EMPLOYMENT HISTORY

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### Barista

Aug. 2024 – Jan. 2025

*Soho Coffehouse*

*Bath*

- Prepare and serve a variety of coffee beverages while maintaining a clean and organized work area, adhering to hygiene and safety standards
- Provide excellent customer service by engaging with guests, making drink recommendations, and ensuring a welcoming atmosphere
- Assist with food preparation, such as sandwiches and pastries, while ensuring quality and presentation

### Bartender / Steward

Sep. 2023 – Mar. 2024

*Tivoli Cinema*

*Bath*

- Manage entrance and exit points for ticket validation, suppliers and maintenance staff
- Running the café and bar, meaning preparation of beverages (including coffees and cocktails), preparing snacks, managing inventory, and ensuring compliance with health regulations
- Provide a welcoming atmosphere and exceptional service to guests, to ensure a memorable experiences

## EXTRACURRICULAR & HOBBIES

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### Leadership & Teamwork

- In-Game Leader for a university Esports team, driving strategy, coordinating practices, and making real-time tactical decisions.
- Organiser and active participant in a weekly book club, facilitating discussions and fostering collaboration.

### Technical Learning

- Self-directed study in Quantum Computing with IBM Quantum and Azure courses.

### Athletics & Discipline

- Strength training (Power-lifting & Calisthenics) with 3 years of dedicated practice.
- 5+ years of martial arts experience (Thai Boxing, Boxing, Karate, BJJ), demonstrating discipline and resilience.