Germain D. McCaulay-Jones

gmccaulayjones@gmail.com | LinkedIn | GitHub | Portfolio

Education

University of Bath 2021 – 2025

Master of Computing in Computer Science and Mathematics with Honours (2:1)

- **Relevant Modules:** Stats for Data Science, Machine Learning, Data Structures & Algorithms, Differential & Geometric Analysis, Linear & Abstract Algebra, Functional Programming, Parallel Programming, Real & Complex Analysis, Graphs & Networks

The Warriner School 2014 – 2021

A-Levels and GCSEs

- Further Mathematics ($A*$), Mathematics ($A*$), Physics ($A*$), Computer Science (A)
- GCSEs in 10 subjects (including English and Maths)
- Additional Mathematics (A) [**FSMQ**]

Technical Skills

Programming: C++ (STL, Templates, MPI), Python (NumPy, Pandas, Scikit-Learn, TensorFlow, Qiskit), Java, TypeScript, NumPy, Matplotlib, MPI, Git, Docker, Linux

Quantitative: Linear Algebra, Probability, Statistics, Optimisation

Projects

Quantum Computing Dissertation Project | *Python, IBM Qiskit*

- Developed and tested variational quantum eigensolver (VQE) algorithms to approximate ground states of Hamiltonians.
- Applied VQE to prime factorisation of semiprimes, exploring vulnerabilities in RSA encryption.
- Integrated IBM Qiskit and quantum backends to prototype quantum-assisted cryptanalysis methods.

Distributed Matrix Library | *C++, MPI, GoogleTest*

- Implemented distributed matrix operations using MPI for inter-node parallelism and SIMD for intra-node acceleration.
- Validated correctness against dense linear algebra routines; achieved scalable performance across multi-core clusters.
- Designed extensible architecture supporting multiplication, addition, and transpose operations.

Gender and Age Prediction Model | *Python, TensorFlow*

- Built and trained a custom CNN for age and gender classification, incorporating ResNet feature extraction.
- Evaluated performance with emphasis on fairness and bias detection, improving accuracy over baseline models.

Music Streaming Platform | *React, Django, TypeScript, Python*

- Developed RESTful APIs and database schemas for a full-stack music service.
- Built client interfaces in React/Expo and server-side logic in Django.

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 2nd place in People's Vote, showcasing rapid prototyping and teamwork.

Hobbies & Interests

- Self-directed study in category theory and quantum computing (IBM Quantum, Azure).
- Powerlifting and calisthenics, with 3 years of consistent practice.
- Reading across poetry, political theory, programming skill development, and mathematics texts.
- Journaling, programming, gaming, cooking, and fashion.