Harvey Williams
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Victoria Point
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Skills

- **Programming:** Github; Python; C++; Golang; Linux CLI
- **Mathematics:** Markov Chains; Measure Theory; Dynamical Systems
- **Machine Learning:** JAX; Fast.AI; Pytorch; Monte Carlo Methods

Education

University of Manchester / Martingale Scholarship
Sept 2025 - Sept 2026

- Pure mathematics specialising in analysis and geometry
- Dissertation on the analysis of dynamical systems
- Semester 1: Measure and Ergodic Theory; Dynamical Systems; Manifolds; Riemann Surfaces
- Semester 2: Algebraic Topology; Lie Algebras; Computation and Complexity

University of Cambridge / Integrated Masters
Oct 2020 - June 2025

- Specialism in theoretical physics and machine learning
- Research project on statistical sampling in high dimensions — eg Nested Sampling
- Proved the correctness of a novel Hamiltonian Monte Carlo sampling algorithm
- Implemented my research project using JAX
- Part III Exams: Quantum Field Theory; Symmetries; General Relativity; Astrostatistics

The Blue School Sixth Form / A-level
Sept 2016 - July 2018, Wells (Somerset)

- Mathematics (A^*); Further Mathematics (A^*); Chemistry (A^*); Physics (A^*); Biology (A)

Experience

Freelance - Machine Learning / Summer School Tutor
Summer 2025

- Code available on my GitHub under harveywilliams56/CambridgeLondonCamp
- Introduced Loss Functions, Automatic Differentiation and Gradient Descent
- Demonstrated the influence of learning rate on convergence using linear regression
- Discussed how this generalises to neural nets and CNN architectures
- Demonstrated transfer learning with the Fast.AI library in Python

Gurdon Institute/Cambridge Centre for Physical Biology / Researcher
Summer 2024

- Wrote a computer simulation of collective cell motion based on research papers
- Sped up previous code by a factor of 20 whilst improving clarity by rewriting in Golang
- Analysed scaling of possible algorithms
- Argued for and implemented a more explainable approach (Delaunay Triangulation)
- Advised groups at Oxford and Chile carrying out similar research

Cambridge Centre for Carbon Credits / Researcher
Summer 2023

- Produced a pipeline processing data from a remote SQL database into a geospatial format
- Quantified X% suspected fraud and Y% uncertainty on CO_2 capture — X and Y confidential
- Optimised code around a library bug - reducing memory consumption from 16GB to ~1GB

Experience

Teamline / Year in Industry (YINI)
Aug 2019 - Aug 2020, Cambridge

- Designed an ALU in a Hardware Description Language — Nand2Tetris course
- Wrote API based code in Python for a R&D project
- Automated visual testing with OpenCV-Python
- Presented test results to other members of the team
- Promptly flagged a major concern, preventing flawed units from being shipped to customers
- Organised a group entry into the Google Code Jam competition for the interns/grads

Homerton College / Student Ambassador
Summer 2022

- Assisted in the college open day and ran tours throughout Summer

Cambridge Admissions Office / eCAMbassador
July 2021 - January 2022, Remote

- Mentored university applicants who'd faced educational barriers (eg caring responsibilities)
- Shared subject insights and provided feedback on personal statements

St Michael's Mount / Guide
July 2021 - September 2021, Cornwall

- First-aider as well as guide

The Blue School / Teaching Assistant (maths dept.)
Oct 2018 - April 2019, Wells (Somerset)

- Coordinated with teachers to support GCSE pupils in class
- Planned and delivered small group lessons

Wells Cathedral Catering / Catering Assistant
June 2016 - August 2018, Wells (Somerset)

- Part-time job during my A-levels

Volunteering & Awards

- Martingale Scholar 2025-2026
- Selected as Vice-Captain for University Challenge 2025, Homerton College
- Oxford UNIQ+ summer research scholarship 2024 — declined due to an alternative offer
- Martingale Scholarship 2024-2025 — declined as deferral was not possible
- Wrote and delivered a UCAS session to Oxbridge applicants at my former school
- Part IB Physics Rep — successfully lobbied for the release of existing examples
- Competed for Homerton College Boat Club
- I'm also a keen runner and would love to join any office charity runs