

Freddie Bullard

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EDUCATION

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| Durham University , Durham, UK <i>MPhys Physics</i> <ul style="list-style-type: none">• Grade: First Class (82%) in Year 1, Year 2 grades unreleased due to Marking and Assessment Boycott• Relevant Topics: Linear Algebra, Calculus, Statistical Physics, Complex Analysis, ODEs, PDEs, Theoretical Physics, Computational Physics• Awards: Durham Physics Award for Outstanding Achievement (2022) | Summer 2025 |
| City of London School , London, UK <ul style="list-style-type: none">• A levels: Maths - A*, Chemistry - A*, Physics - A* | Summer 2021 |

RESEARCH INTERESTS

Interested in applying numerical and computational methods to solve scientific problems across fields.

RESEARCH EXPERIENCE

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| Level 3 Computing Project <i>Department of Physics, Durham University</i> <ul style="list-style-type: none">• Investigating solutions to classical NP-hard mathematical optimisation problems with Adiabatic Quantum Computing simulated in Python | Autumn 2023 – Present |
| Level 3 Advanced Laboratory <i>Department of Physics, Durham University</i> <ul style="list-style-type: none">• Investigating the use of stress induced birefringence in studying the stresses and strains in complex structures under load• Looking to apply classification algorithms to remove subjectivity in photoelasticity image analysis | Autumn 2023 – Present |
| Level 2 Research Led Investigation <i>Department of Physics, Durham University</i> <ul style="list-style-type: none">• Investigated the dark matter content of the spiral galaxy M82 through analysis of its rotation curve from HI and CO emission lines, and its luminosity as a function of distance from the galactic centre• Applied image processing techniques with ImageJ, including as dark and bias subtraction, and flat field correction, to reduce uncertainty in our data | Spring 2023 |

PROFESSIONAL EXPERIENCE

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| Software Development Engineer Intern <i>Expedia Group, London</i> <ul style="list-style-type: none">• Worked in a team of 10, developing and maintaining the ad delivery and tracking services• Enhanced and extended a RESTful API service to track events related to ad impressions, utilised Kotlin and Spring to implement new tracking functionalities | Summer 2023 |
| Software Engineer Intern <i>Spectrum Logic, London</i> <ul style="list-style-type: none">• Designed and implemented an image segmentation algorithm in Python to automate region-of-interest detection in low contrast, 16-bit greyscale images for their Western Blot CMOS 1:1 image scanner | Summer 2022 |

PERSONAL PROJECTS

Brain MRI Segmentation with Deep Learning | Python, PyTorch Summer 2023 – Present

- Applying Deep Learning to automate identification of tumour shape features in brain MRI scans
- Leveraging hypothesis testing to analyse the relationship between imaging features and genomic clusters

Noise Reduction Web App | Python Summer 2022

- Implemented Gaussian, Median and Bilateral filters from scratch in Python with NumPy
- Developed a full-stack web application using Python with Flask, hosted on Google Cloud Platform

ONLINE COURSES

Finding Hidden Messages in DNA (Bioinformatics I) Summer 2023

UC San Diego via Coursera

Neural Networks and Deep Learning Summer 2023

DeepLearning.AI via Coursera

6.006 Introduction to Algorithms Summer 2022

MIT OCW

6.0001 Introduction to Computer Science and Programming in Python Summer 2022

MIT OCW

TECHNICAL SKILLS

Languages: Python, Kotlin, HTML/CSS, \LaTeX

Libraries and Frameworks: PyTorch, NumPy, SciPy, Matplotlib

Other: VS Code, IntelliJ, Git, Linux, MacOS, Windows, ImageJ

REFERENCES

Available upon request