

Callum McDougall

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EDUCATION

University of Cambridge

Cambridge, UK

Master of Mathematics

2018 – 2022

Year 3: Class I [rank 11/222], Year 2: Class I [honorary], Year 1: Class I [rank 38/232]

- **Awards:** Dr J.A.J. Whelan Prize in Mathematics, Christ's College Academic Scholarship (1st, 2nd & 3rd years)
- **Courses:** Statistics, Optimisation, Applied Probability, Automata & Formal Languages, Logic & Set Theory

Westminster School

London, UK

STEP: S, S ("Outstanding") grades in papers II and III (top 15 in the country)

2013 – 2018

A Levels: Maths (A), Further Maths (A*), Economics (A*), Physics (D1, equivalent to high A*)*

- UKMT: Certificate of Distinction in second round of the British Mathematical Olympiad (top 25 of 30,000 students)
- Senior Cheyne Prize for Mathematical Excellence (awarded to one senior student annually)

EXPERIENCE

Cambridge Existential Risks Initiative

Cambridge, UK

Committee member

Sept 2021 – present

- Organising CERI activities such as the AGI Safety Fundamentals Programme
- Co-leading a reading group on *Human Compatible: Artificial Intelligence and the Problem of Control*

Jane Street Capital

London, UK

Quantitative Research Intern

Jun 2021 – Aug 2021

- Participated in team-based mock trading sessions, requiring delegation and coordination
- Built a volatility model for corporate bonds using Gradient Boosted Trees
- Developed methods for interactive visualisation of the GBT result in Python
- Received a full-time offer

Effective Altruism, Cambridge

Cambridge, UK

Facilitator

Jan 2020 – Mar 2020

- Facilitated the Effective Altruism Introductory Fellowship for two groups of Cambridge residents
- Helped to promote discussion of important topics, and helped fellows engage with ideas
- One fellow is now a member of the EA Cambridge Extended Committee

PROJECTS

Computational Thread Art

Jul 2019 – present

- Created a Python program which renders an image as a series of lines between vertices, joined by a Eulerian path
- Experimented with different search depths to improve performance
- Designed a custom loss function to enhance accuracy in specific regions of the image (full code on [GitHub](#))
- Physically created these pieces using bike wheels & coloured thread (writeup on [Medium](#))
- Currently building a robotic gantry system to automate the threading

Automated Trading Strategy Success Correlation

Oct 2018 – Nov 2018

- Used Python to investigate the extent to which success of automated trading strategies can be linked across multiple equities that are not correlated in price (full report on [GitHub](#))
- Scraped historical price data for highly liquid stocks and ETFs, and tested a long-short momentum strategy

SKILLS, ACTIVITIES & INTERESTS

Technical Skills: Python, MATLAB, Excel, VBA, SQL, LaTeX, C, JavaScript, HTML

Certifications & Training: Guinness World Record holder

Activities: member of Cambridge University Archimedean, Effective Altruism, Cambridge Existential Risks Initiative

Interests: chess, rock-climbing, mathematical art