

Matthew Mark Zahra

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EDUCATION AND AWARDS

Master of Computer Science, Balliol College, University of Oxford	2022 to present
First year: Distinction ; awarded Prelims Prize	
Second Year: Distinction ; awarded Elliott Meriweather Bell Exhibition Prize for distinction	
Third Year: Distinction ; awarded Academic Scholarship for consecutive distinctions; Top 10 in cohort	
Senior School: Stewart's Melville College, Edinburgh	2016 to 2022
Scottish Advanced Highers: A1 (97%) - Maths; Mathematics of Mechanics; Computing Science	
• Awarded numerous school prizes including Daniel Stewart Prize (DUX), Valedictorian.	

WORK EXPERIENCE

Castleton Commodities International

Front Office Developer Intern July 2025 – September 2025

- Supported commodities traders by building market-analysis tools, optimising current processes and fixing existing bugs.
- Working on a real-time market anomaly alert system, ensuring it can cope with 1000s of messages per second.
- Worked on event-driven, distributed systems, ensuring concurrent tasks avoid race conditions/deadlocks.
- Delivered internal tools, focusing on API-driven development, ensuring they are compatible with the current ecosystem.

Go Reply, Generative AI and Google Cloud Platform

Cloud Consultant Intern March 2024; July – August 2024

- Built an application allowing users to manage and view MRI scans. Storing information and giving summaries using GenAI.
- Built on GCP with Python, making use of Google products such as Cloud Storage, Vertex AI, Firestore, Healthcare API, Dialogflow, Cloud Functions and Cloud Run as well as supporting authentication with official Google accounts.
- Research on multibillion-pound potential future client, presenting possible strategies to the technical and non-technical teams.

Oxbridge Formula

Academic Tutor (Mathematics and Computer Science); Website Administration Intern 2022-2024 (Freelance at present); 2022

- Tutored school students for STEM Oxbridge Entrance exams and interviews: MAT, TMUA and STEP.
- Built and bug tested the new website, designed pages with FIGMA, led on several initiatives and trained a new team member.

Oxford University and ESM Hockey Club

Hockey Coach & Umpire for youth and adult 2018 to present.

PROJECTS & CERTIFICATES

Improving Memory Consumption of Open Source Cryptographic Verification Tool ProVerif (OCaml) 2024-2025

- To reduce memory consumption in the verification process, I used hash-consing techniques, introducing an internal DAG representation for terms to allow sharing of structurally equal objects.
- Aimed to achieve optimal compression via a Binary Linear Program. Designed tractable approximation algorithms that exploit the DAG structures. Conducted rigorous benchmarking, achieving a **70,000** times lossless improvement.
- Proved theoretic time complexity bounds for the compression problem.

Extending a Compiler for Pascal (OCaml, Assembly, C) 2024

- Extended an existing Pascal compiler to allow for arrays of arbitrary size as parameters, pointers to such arrays, and taking slices of arrays. I extended a context-free grammar and manipulated code generation as well as the intermediate language.

Training a Machine Learning Model to Detect Greenwashing (Python) 2024

- Cleaned dataset by training a bi-gram and then trained ML model to detect greenwashing in text extracted from websites.
- I presented my work to the client, ensuring the code I produced was usable and maintainable.

A Novel Integrated Measure of HDR Brachytherapy Plan Quality (Python); Edinburgh Cancer Centre 2023

- I identified a correlation between effectiveness of different plans and magnitude of the corresponding tuples by transforming treatment plans into n-dimensional vectors. I wrote a Python script to calculate and display results.
- Presented as **abstract and poster** at the European Society for Therapeutic Radiology and Oncology 2024.

Extract & Summarise Donor Data; Edinburgh Tissue Establishment (Python) 2023

- Wrote a script to extract information from large donor datasets, ensuring robustness and alerting when data quality is poor.

Machine Learning and Pandas Proficiency from Kaggle (Python) 2023

Kaplan Meier Survival Curve Generator (Python); Edinburgh Cancer Centre 2022

- Wrote a program to calculate probability of patient survival at time 't' where dataset contains censored data.

SKILLS AND INTERESTS

Proficient:	Python, OCaml, Scala, Haskell, SQL
Intermediate:	HTML, CSS, Java, PHP, Google Cloud Platform
Basic:	C, ARM Assembly Language, JavaScript, Docker
Interests:	Hockey (University of Oxford Men's 1 st XI, Scotland Youth Program), Chess