Maxwell Catmur

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# Profile

Aspiring Software Engineer experienced in Python, C and MATLAB with a track record of performance optimisation, data-driven debugging and end-to-end ownership. Seeking a Software Engineer role at Meta to apply system architecture thinking, scalable systems design and cross-functional collaboration.

# Education

**MPhys Physics – University of Warwick October 2022 – July 2026**

**Grade:** First (expected)

* Completed high-performance computing and scientific computing modules; implemented numerical methods in C and MATLAB for engineering problems.
* Ran 10,000+ N-body simulations with a Python integrator; analysed orbital stability using MEGNO and advanced post-processing techniques.
* Numerically solved partial differential equations in C using finite-difference methods to model industrial heat flow, assessed accuracy and runtime trade-offs.
* Investigated metastability in the 2D Ising model via dozens of Monte Carlo simulations (MATLAB); co-authored a short paper with collaborators.
* Designed and implemented a PID-based stabilisation algorithm in LabVIEW for a mechanical test rig, improving system stability and control.

**A-levels – Forest School September 2020 – July 2022**

**Grade:** A\*A\*A\*A\*A\* (Maths, Further Maths, Physics, Chemistry, Extended Project)

* Received sixth-form valedictorian award for top academic performance.
* Completed a 5,000-word extended project on mitigation of climate change via renewable energy, nuclear power and geoengineering (100%).
* Presented research to a cohort of 160+ students and staff, demonstrating clear technical communication and public speaking.

# Work Experience

**Undergraduate Researcher**

Warwick Mathematics Institute **June 2025 – October 2025**

* Modelled finite-difference methods for wave propagation across 100+ aeroacoustics simulations over three months, comparing accuracy and computational cost.
* Analysed performance of 10 maximal-order, dispersion-relation-preserving schemes in MATLAB; used quantitative metrics to guide selection and optimisation.
* Presented results via a research poster at an institute event, communicating technical trade-offs to academic peers.

**Project Manager**

Warwick Aerospace Society **January 2024 – March 2025**

* Led a 12-member student team to develop a UHF satellite ground station proof-of-concept; established four sub-teams and set technical direction.
* Authored 30+ pages of documentation including Pugh matrices and a bill of materials; coordinated procurement, design and assembly to deliver within 10 weeks.
* Introduced GitHub-based version control and initiated MATLAB/Simulink modelling for rotator control, improving collaboration and reproducibility.

**RF Seekers Summer Intern**

MBDA UK **June 2024 – August 2024**

* Interned 10 weeks in Modelling and Algorithms team working on synthetic aperture radar (SAR) processing chains for AESA radar systems.
* Optimised a matched-filter algorithm in MATLAB by implementing FFT, reducing runtime by 85% and materially improving system throughput.
* Co-developed a data-analysis application used by six colleagues for rapid range–Doppler image inspection; integrated a mid-fidelity check to accelerate validation and sanity checks.
* Delivered 50+ commits using professional version-control workflows and presented technical outcomes to 20+ colleagues.

# Projects

**AI CV Generator July 2025 – ongoing**

* Built a CV and cover-letter generator using OpenAI's API in Python; used Pydantic BaseModel for structured JSON output and docxtpl for Word generation.
* Implemented two SQL databases to store applications and track progress; iteratively improved matching to job descriptions using ATS feedback.
* Achieved ATS scores above 50% on three checker sites and contributed to two job offers after 200 applications, demonstrating data-driven product improvement.

**Drinks Ordering Web App August 2018 – September 2018**

* Developed a web application to process orders for a party of 100+ guests, handling 80+ orders in six hours and removing physical queues.
* Implemented asynchronous updates with Ajax and JavaScript to reflect order status in real time on the front end.
* Received positive feedback from professional software engineers and event staff on reliability and usability.

# Skills

**Languages**: Python, C, MATLAB, JavaScript, SQL, PHP, HTML, CSS.

**Libraries:** NumPy, SciPy, Matplotlib, SQLite, pydantic, docxtpl.

**Tools:** Git, GitHub, MATLAB, Simulink, LabVIEW, OpenAI API.

**Soft Skills:** Cross-functional collaboration, Technical leadership and project ownership, Data-driven debugging and analysis, Clear technical communication, Problem-solving.

**Interests:** Machine learning, Amateur radio, Tennis, Football, Chess, Debating.