Maxwell Catmur

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# Profile

Physics MPhys student applying for Graduate Digital Solution Engineer roles. Practical Python developer with experience in data analysis, generative AI prototypes (OpenAI/ChatGPT), numerical simulation and technical documentation. Eager to support TOMONI-based digital transformation, on-site implementation and troubleshooting across power-generation systems.

# Education

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

**Grade:** First (expected)

* Relevant modules: scientific and high-performance computing, advanced mathematical methods, statistical physics and numerical modelling (finite-difference PDEs).
* Developed numerical solvers in C and MATLAB for heat-flow and wave-propagation problems; ran 10,000+ simulations in Python for orbital stability analysis.
* Implemented control and data-acquisition code in LabVIEW for a stabilisation algorithm; designed and tested analogue DC regulator circuits.
* Led and coordinated group research projects (6 members), chairing meetings, delegating tasks and producing technical reports and posters.

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

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

* Extended Project (5000 words) on renewable and nuclear energy mitigation strategies, awarded 100%.
* Sixth form valedictorian award for academic performance.
* Presented research findings to a cohort of 160+ students and staff, demonstrating clear written and verbal communication.

# Work Experience

**Undergraduate Researcher**

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

* Modelled finite-difference methods for wave propagation across 100+ aeroacoustics simulations, optimising schemes for accuracy and cost.
* Analysed performance of maximal-order and dispersion-relation-preserving schemes in MATLAB, producing reproducible comparisons and visualisations.
* Prepared a research poster and concise technical summary for departmental dissemination, improving clarity of results for multidisciplinary audiences.

**Project Manager**

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

* Managed a 12-person team to design and build a proof-of-concept UHF satellite ground station; coordinated procurement, assembly and testing within 10 weeks.
* Authored 30+ pages of technical documentation including bill of materials, system selection matrices and test procedures to support validation and handover.
* Introduced GitHub-based version control and MATLAB/Simulink modelling practices, improving reproducibility and collaboration across sub-teams.

**RF Seekers Summer Intern**

MBDA UK **June 2024 – August 2024**

* Interned in the Modelling and Algorithms team developing SAR processing chains for AESA radar systems; implemented professional version control practices (50+ commits).
* Optimised a matched-filter algorithm in MATLAB using FFT techniques, reducing runtime by 85% and improving analysis throughput.
* Co-developed a data-analysis application to speed range–Doppler image inspection and integrated mid-fidelity algorithms for rapid validation; presented outcomes to colleagues.

# Projects

**AI CV Generator July 2025 – ongoing**

* Built a job-tailored CV and cover-letter generator using OpenAI's API (Python); implemented prompt engineering and structured JSON output via Pydantic.
* Stored application data in SQL databases and automated document generation with docxtpl; achieved measurable ATS compatibility across multiple checks.
* Used the project to refine generative AI workflows and validation approaches relevant to digital-assistant and automation toolchains.

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

* Developed a web app to process 80+ orders at a 100+ guest event, removing queues via asynchronous Ajax updates of order status.
* Designed front-end and back-end interaction and logged orders in a lightweight SQL store to ensure reliability under load.
* Received positive feedback from event staff and two professional software engineers for robustness and usability.

# Skills

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

**Libraries:** NumPy, SciPy, Matplotlib, pydantic, openAI.

**Tools:** Microsoft Office (Excel, Word, PowerPoint), Git / GitHub, LabVIEW, MATLAB/Simulink.

**Soft Skills:** Analytical thinking, Problem solving, Clear written and verbal communication, Team collaboration, Adaptability and proactive learning.

**Interests:** Machine learning and data visualisation, Predictive maintenance and IoT applications, Amateur radio.