Maxwell Catmur

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# Profile

Physics graduate seeking Graduate Digital Solution Engineer 2025 at Mitsubishi Power. Strong programming (Python, MATLAB), statistics and machine-learning foundations, generative AI experience (OpenAI/ChatGPT) and practical data-visualisation and technical documentation skills. Ready for on-site deployment, troubleshooting and customer-facing support.

# Education

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

**Grade:** First (expected)

* Relevant modules: scientific and high-performance computing, advanced mathematical methods, fluid mechanics, statistical physics and numerical methods (finite differences).
* Developed numerical models: solved PDEs in C via finite-difference methods to model heat flow through industrial pipes (95%).
* Ran 10,000+ N-body simulations in Python, implemented MEGNO for orbital stability analysis and advanced post-processing.
* Monte Carlo simulations in MATLAB investigating metastability in the 2D Ising model; co-authored a paper with peers.
* Designed LabVIEW PID stabilisation for a nodding-donkey system and built a DC regulator circuit using op-amps and MOSFETs.

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

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

* Extended research project (5,000 words) on renewable energy, nuclear power and geoengineering; awarded 100%.
* Received sixth form valedictorian award for academic performance.
* Presented project findings to a cohort of 160+ students and staff, demonstrating clear spoken communication.

# Work Experience

**Undergraduate Researcher**

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

* Modelled finite-difference methods for wave propagation across 100+ aeroacoustics simulations, validating numerical stability and dispersion properties.
* Analysed performance of maximal-order and dispersion-relation-preserving schemes in MATLAB, optimising for accuracy and computational cost.
* Produced a technical poster summarising results for a research event, communicating numerical methods and findings to academic peers.

**Project Manager**

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

* Led a 12-member student team to design and build a proof-of-concept UHF satellite ground station, managing schedules, sub-teams and delivery.
* Authored 30+ pages of technical documentation including bill of materials, Pugh matrices for antenna selection and assembly procedures.
* Coordinated procurement and assembly to deliver the prototype in 10 weeks, working closely with the Chief Engineer.
* Introduced MATLAB/Simulink modelling and GitHub-based version control to support system design and collaborative development.

**Fly Your Satellite Workshop (Participant)**

European Space Agency **November 2024 – November 2024**

* Completed a 5-day ESA workshop on CubeSat development covering systems engineering, requirements and ground-station communications.
* Participated in a rapid CubeSat design sprint with a 10-person team, meeting mission requirements under time pressure through effective delegation.
* Gained practical exposure to systems-level testing, requirements practices and ground-station communication trade-offs.

**RF Seekers Summer Intern**

MBDA UK **June 2024 – August 2024**

* Interned in the Modelling and Algorithms team on SAR imagery chains for AESA radar systems, building domain understanding from literature review.
* Optimised a matched-filter algorithm in MATLAB using FFT, reducing runtime by 85% and improving processing throughput.
* Co-developed a data-analysis application enabling six colleagues to rapidly inspect range–Doppler images and integrated a mid-fidelity check algorithm.
* Delivered 50+ commits using professional software development practices and presented placement outcomes to colleagues.

# Projects

**AI CV Generator July 2025 – ongoing**

* Developed a CV and cover-letter generator in Python using OpenAI's API to tailor applications to job descriptions (generative AI / LLM integration).
* Used Pydantic for structured JSON outputs and docxtpl to generate formatted Word documents for applicants.
* Built two SQL databases to store applications and track progress; applied version control and iterative testing.
* Validated outputs with ATS-checkers and tracked application outcomes; project informed practical use of generative AI and automation.

# Skills

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

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

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

**Soft Skills:** Analytical thinking, Problem-solving, Clear written and verbal communication, Teamwork and cross-functional collaboration, Customer-facing confidence and on-site support readiness, Proactive learner and adaptable.

**Interests:** Machine learning, Predictive maintenance IoT (interest), Data visualisation (Matplotlib; exploring Power BI/Tableau), Amateur radio.