Maxwell Catmur

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# Profile

MPhys Physics (First expected) from University of Warwick seeking a Graduate / Junior Electronics FPGA Design Engineer role. Strong grounding in analogue and digital electronics, hardware prototyping and lab debugging, with hands-on circuit build and LabVIEW control experience. Eager to develop FPGA and board-level design skills within multidisciplinary telecommunications teams.

# Education

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

**Grade:** First (expected)

* Relevant modules: scientific and high-performance computing, advanced mathematical methods, electromagnetism — solid foundation in analogue and digital theory.
* Co-developed a stabilisation algorithm in LabVIEW for a nodding-donkey system, implementing PID control and additional motion control features (86%).
* Designed, built and tested a DC voltage regulator circuit incorporating op-amps and MOSFETs; performed bench testing and fault diagnosis.
* Numerically solved PDEs in C using finite-difference methods to model industrial heat flow (95%), demonstrating robust numerical and coding skills.
* Ran 10,000+ N-body simulations in Python to model orbital stability and applied MEGNO for quantitative stability analysis.

**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 best academic performance.
* Extended Project (5,000 words) on renewables, nuclear power and geoengineering; awarded 100%.
* Presented findings to 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 schemes for wave propagation, running 100+ aeroacoustics simulations implemented in MATLAB.
* Analysed performance of 10 high-order and dispersion-relation-preserving schemes, optimising accuracy versus computational cost.
* Prepared and presented a research poster summarising methods and results to academic peers.

**Project Manager**

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

* Managed a 12-member student team delivering a proof-of-concept UHF satellite ground station; set milestones and chaired weekly meetings.
* Authored 30+ pages of technical documentation, bill of materials and Pugh matrices to support antenna and component selection.
* Oversaw procurement, assembly and testing of the passive UHF ground station within 10 weeks, coordinating with the Chief Engineer.
* Implemented MATLAB/Simulink modelling of half-duplex rotator control and introduced GitHub-based version control for 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.
* Attended expert lectures and toured ESTEC, consolidating knowledge of satellite communications and systems-level design.
* Led a 60-minute CubeSat design sprint with a 10-student team, meeting mission requirements under significant time pressure.

**RF Seekers Summer Intern**

MBDA UK **June 2024 – August 2024**

* Interned 10 weeks in the Modelling and Algorithms team, working on SAR processing chains within AESA radar systems.
* Optimised a matched-filter algorithm by implementing FFT, reducing runtime by 85% and improving end-to-end performance.
* Co-developed a data-analysis application to accelerate range–Doppler image review for six colleagues; integrated mid-fidelity sanity checks.
* Contributed 50+ commits using professional version control and presented technical outcomes to 20+ colleagues.
* Reviewed AESA and SAR literature to build domain knowledge relevant to RF and telecommunications.

# Projects

**AI CV Generator July 2025 – ongoing**

* Developed a CV and cover-letter generator using OpenAI's API and Python, ensuring structured JSON outputs with Pydantic and docxtpl.
* Built two SQL databases to track applications and progress; integrated Git-based workflows for version control and collaboration.
* Validated outputs against multiple ATS checkers (scores >50%) and iterated templates to improve keyword matching.
* Adopted modular, test-driven development practices to produce maintainable, reproducible results.

# Skills

**Languages**: Python, MATLAB, C, Simulink, SQL, JSON.

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

**Tools:** Git / GitHub, LabVIEW, MATLAB Satellite Communications Toolbox, Origin Pro, Board-level electronics and PCB layout review (familiarity), Hardware prototyping and lab debugging (circuit assembly and bench testing).

**Soft Skills:** Analytical thinking, Teamwork and cross-discipline collaboration, Technical communication, Adaptability and fast learning, Responsibility and project ownership.

**Interests:** Satellite communications, Wireless systems and RF, Signal processing, Amateur radio, Machine learning.