Maxwell Catmur

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# Profile

MPhys Physics student targeting Graduate RF/uWave Systems Engineer at Cambridge Consultants. Experience in RF and UHF system prototyping, radar signal processing, analogue circuit design and MATLAB/Simulink modelling. Strong technical documentation, presentations and cross-disciplinary collaboration skills.

# Education

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

**Grade:** First (expected)

* Relevant modules: electromagnetism, scientific and high-performance computing, advanced mathematical methods and signal processing.
* Designed, built and tested a DC voltage regulator circuit using op‑amps and MOSFETs; validated behaviour on a physical prototype.
* Developed PID control and LabVIEW code for a stabilisation mechanism; implemented MATLAB simulations and Monte Carlo methods for research projects.
* Ran 10,000+ simulations modelling orbital stability and performed quantitative post-processing using MEGNO techniques.

**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 mitigation strategies for climate change; achieved 100% and presented to a cohort of 160+ students and staff.
* Sixth form valedictorian award for academic performance.
* Delivered high‑quality public presentations and demonstrated strong written research skills.

# Work Experience

**Undergraduate Researcher**

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

* Modelled finite‑difference schemes for wave propagation, running 100+ aeroacoustic simulations to evaluate numerical dispersion and stability.
* Analysed and compared 10 high‑order schemes in MATLAB, optimising for accuracy versus computational cost.
* Prepared concise technical poster and documentation summarising methodology and numerical results for dissemination at an internal research event.

**RF Seekers Summer Intern**

MBDA UK **June 2024 – August 2024**

* Worked on synthetic aperture radar (SAR) processing chains within AESA radar systems, gaining practical exposure to radar signal flows and RF system concepts.
* Optimised a matched‑filter algorithm in MATLAB using FFTs, reducing runtime by 85% and improving prototype processing throughput.
* Integrated a mid‑fidelity range–Doppler imagery algorithm into a data‑analysis tool, delivered 50+ commits and presented results to a team of engineers.

**Project Manager**

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

* Led a 12‑member team developing a proof‑of‑concept UHF satellite ground station, defining radio architecture from digital interface to antenna.
* Authored 30+ pages of technical documentation, performed antenna selection using Pugh matrices and produced a detailed bill of materials for procurement and assembly.
* Coordinated design, procurement and assembly to deliver the prototype in 10 weeks; initiated MATLAB/Simulink models for half‑duplex rotator control and satellite communications.

**Participant — Fly Your Satellite Workshop**

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

* Completed a 5‑day ESA workshop on CubeSat systems engineering and ground station communications, attending lectures from technical experts.
* Collaborated in a rapid design sprint simulating a CubeSat and its communications link, meeting mission requirements under time pressure.
* Gained further practical insight into rotator‑based half‑duplex UHF ground station communications and system integration challenges.

# Projects

**AI CV Generator July 2025 – ongoing**

* Developed a CV and cover‑letter generator using OpenAI's API in Python, producing structured JSON outputs via Pydantic and templated Word documents with docxtpl.
* Implemented SQL databases to track applications and achieved ATS pass rates above 50% on multiple checker sites.
* Applied professional software development practices and version control to deliver a repeatable recruitment tool.

# Skills

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

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

**Tools:** Git / GitHub, LabVIEW, MATLAB Satellite Communication Toolbox, Microsoft Office, Origin Pro.

**Soft Skills:** Technical documentation and reporting, Client‑facing presentation, Cross‑disciplinary collaboration, Analytical problem solving, Project coordination.

**Interests:** Amateur radio, Telecommunications, Signal processing.