Maxwell Catmur

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# Profile

Aspiring Graduate Building Physics Engineer (available September 2025) with an MPhys (expected First) and strong simulation experience in MATLAB, Python and finite-difference modelling. Passionate about sustainable building design, thermodynamics and energy systems. Right to work in the UK. Preferred locations: Swindon (1st), Bristol (2nd).

# Education

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

**Grade:** First (expected)

* Relevant modules: advanced mathematical methods, fluid mechanics, thermodynamics and scientific/high-performance computing (strong foundation in energy systems and PDEs).
* Numerically solved partial differential equations in C using finite-difference methods to model heat flow through industrial pipes (assessed at 95%).
* Led two group research projects (6 members each) on photovoltaic materials and photocathodes, coordinating tasks and delivering 70%+ results; experience advising/liaising within multidisciplinary teams.
* Implemented large-scale Monte Carlo and numerical simulation workflows (MATLAB, Python) demonstrating robust data analysis and automation for research outputs.

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

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

* Produced a 5,000-word Extended Project on renewable energy, nuclear power and geoengineering achieving 100% — demonstrating strong interest in sustainable technologies and carbon reduction.
* Received sixth form valedictorian award for academic performance.
* Presented research findings to a cohort of 160+ students and staff, evidencing clear verbal communication and public presentation skills.

# Work Experience

**Undergraduate Researcher**

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

* Applied finite-difference numerical methods to run 100+ aeroacoustics simulations, developing robust scripting and post-processing workflows in MATLAB.
* Analysed accuracy and computational cost of maximal-order schemes, optimising algorithms for stability and efficiency — transferable skills for thermal and building-performance modelling.
* Produced and presented a research poster summarising methodology and results at an institute event, demonstrating technical report and presentation capability.

**Project Manager**

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

* Managed a 12-member engineering team to design and build a proof-of-concept passive UHF ground station, coordinating procurement, assembly and testing within a 10-week schedule.
* Chaired weekly meetings, delegated tasks across four sub-teams and produced technical documentation and bills of materials — developing time management and multidisciplinary team-working skills.
* Developed MATLAB/Simulink models for rotator control and introduced GitHub version control to streamline collaborative model development.

**RF Seekers Summer Intern**

MBDA UK **June 2024 – August 2024**

* Contributed to a modelling and algorithms team working on synthetic aperture radar processing chains; implemented algorithmic optimisations in MATLAB to reduce runtime by 85% using FFT methods.
* Co-developed a data-analysis application enabling rapid inspection of range–Doppler imagery, integrating a mid-fidelity algorithm for quick sanity checks and improving team productivity.
* Adopted professional software practices including version control, delivered 50+ commits, and presented technical outcomes to colleagues — demonstrating clear written and verbal communication.

# Projects

**AI CV Generator July 2025 – ongoing**

* Developed an automated CV and cover-letter generator using OpenAI API and Python, employing Pydantic for structured JSON output and docxtpl for document generation.
* Built two SQL databases to track applications and outcomes; implemented automation that improved application tracking and reporting.
* Designed the tool to be ATS-aware; achieved >50% on three ATS-checker sites and supported two job offers after 200 applications, demonstrating practical outcomes from scripting and automation skills.

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

* Developed a web application to handle drink orders at a 100+ guest event using JavaScript and Ajax for asynchronous updates.
* Processed 80+ orders over six hours and removed physical queues, demonstrating reliable software deployment under load.
* Received positive technical feedback from professional software engineers and event staff for usability and robustness.

# Skills

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

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

**Tools:** Finite-difference and PDE numerical methods, MATLAB/Simulink, Git / GitHub, LabVIEW, Microsoft Office, IES Virtual Environment (self-study / learning), PHPP (familiarisation / self-study).

**Soft Skills:** Analytical thinking and problem solving, Teamwork and multidisciplinary collaboration, Clear written and verbal communication, Adaptability and quick learning, Time management and presentation skills.

**Interests:** Sustainable building design, Renewable energy systems, Building physics and thermal comfort, Amateur radio.