EMMANUEL V. PÉAN

Automation Software Engineer | System Integration | Python Developer

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PERSONAL PROFILE

I hold a PhD in Materials Science and Engineering with a focus on photochemistry and spectroscopy. I thrive on solving complex scientific problems through automation, data analysis, and system development. With a strong focus on efficiency and precision, I design innovative tools and processes that optimise research workflows and improve data reliability. Passionate about advancing technology, I am dedicated to creating solutions that meet the evolving needs of R&D teams.

EXPERIENCE

Software Developer

E2E ASSURE, UK 📅 2025 – Present 📍 Oxford, UK

- Contribute to front-end and back-end development by fixing bugs and implementing new features using Python, HTML, JavaScript, and TypeScript.
- Hands-on experience with version control, code reviews, and agile development workflows.
- Collaborate with senior developers to understand codebases, improve functionality, and ensure feature compatibility.

Research & Development Engineer

OXFORD PHOTOVOLTAICS LTD, UK 📅 2023 – 2025 📍 Oxford, UK

- Led the design and implementation of a fully automated photoluminescence quantum efficiency setup, integrating Python-based user-friendly software and robotic sample handling. The system enabled measurement of 24 samples with a single 30-minute setup, eliminating manual sample changes every 25 minutes, increasing measurement accuracy, decreasing human error, and introducing advanced capabilities for probing absorber layer quality previously unattainable with the non-automated setup.
- Proposed and developed a user-customisable dashboard with advanced analysis tools and a bespoke Python API for seamless integration with an internal database. This solution enabled engineers to track data trends over time and improved the speed of generating experimental plots by a factor of ten compared to traditional querying and plotting workflows.
- Designed and conducted experiments to enhance solar cell efficiency and reliability under high-stress conditions.
- Analysed large datasets to identify correlations between fundamental properties of the absorber layer and the device performance metrics.
- Authored comprehensive reports highlighting key findings and discoveries, alongside creating clear and concise SOPs to ensure consistency and reproducibility.
- Mentored and trained technicians in operating advanced instruments and adhering to laboratory best practices.

STRENGTHS

System Integration
Experienced in developing automated systems, from the hardware all the way to the graphical user interface.

Prototyping
Skilled in creating prototypes, testing designs, and iterating based on feedback using CAD (*SolidWorks* & *Fusion 360*) and 3D printing.

Python Programming
Over 11 years of experience using Python for data analysis (*NumPy*, *Pandas*, *Matplotlib*), fitting (*SciPy*), and developing desktop (*Tkinter*, *PyVISA*) and web applications (*Streamlit*, *Plotly*). Also experienced in SQL (*SQLAlchemy*, *Alembic*).

High Quality Presentations & Reports
Experienced in producing high-quality documents, with recognition through multiple awards for scientific posters, presentations, and theses.

Initiative & Problem-Solving
I proactively identify opportunities to improve workflows, applying my skills to develop efficient solutions.

PERSONAL SKILLS

Adaptable & Flexible Collaborative Critical Thinker Detail-Oriented Effective Communicator Fast Learner Proactive Problem Solver Time Management Team Player

EXPERIENCE

Research Fellow

SWANSEA UNIVERSITY, UK   🗓 2022 – 2023   📍 Swansea, UK

- Secured a competitive £85,000 grant to design and build a time-resolved microwave photoconductivity setup. This state-of-the-art setup, comprising 28 distinct components, featured computer-controlled automation of nine key elements through a robust Python-based GUI, enabling complex measurements to advance perovskite material research. Numerous parts of the setup were designed using *SolidWorks* and then 3D printed, allowing for a fully customised and compact design.
- Supervised master's and doctoral students, managed training, instrument maintenance, and manufacturer communication. Authored SOPs and ensured lab safety and operational efficiency. Initiated a collaboration with Delft University.
- Conducted risk and COSHH assessments for experiments involving lasers, chemicals, radiation, and gases.

Technology Transfer Fellow

SWANSEA UNIVERSITY, UK   🗓 2020 – 2022   📍 Swansea, UK

- Designed and implemented an automated fluence-dependent time-resolved photoluminescence setup, integrating custom software with instrument controls and 3D-printed apparatus to enable precise data acquisition.
- Created and published *Pears*, a free website for advanced fitting of time-resolved photoluminescence data.
- Pioneered time-resolved photoluminescence characterisation and analysis at Swansea University using advanced charge carrier recombination models.

EDUCATION

Materials Science and Engineering PhD

Swansea University   🗓 2016 – 2020   📍 Swansea, UK

Thesis title: *Shining a Light on the Photochemistry of Methylammonium Lead Iodide Perovskite for Solar Cell Applications.*
Investigated perovskite photochemistry for solar cells using time-resolved and steady-state photoluminescence, UV-Vis spectroscopy, X-ray diffractometry, and various microscopy techniques, uncovering key properties to enhance performance and stability.

Nanosciences MSc

Université de Nantes   🗓 2014 – 2016   📍 Nantes, FR

Thesis title: *Explanation and Rationalisation of the Electronic Properties of the $CdIn_2S_4$ Compound: Establishment of a Protocol for Calculating Defect Formation Energy.*
Developed a post-processing software allowing to easily compute the formation energy of any defects from DFT calculations.

Physics BSc

Université de Nantes   🗓 2011 – 2014   📍 Nantes, FR

KEY ACHIEVEMENTS

Time-Resolved Microwave Photoconductivity Setup

Developed a state-of-the-art setup with nine automated components controlled via a Python-based GUI, streamlining complex measurements.

Fully Automated Photoluminescence Quantum Efficiency Setup

Developed a fully automated setup featuring a gantry system for precise sample placement into an integrating sphere, seamlessly integrated with a custom Python GUI, streamlining and optimising complex experimental workflows.

Interactive Dashboard

Developed a user-customisable dashboard and analysis tools, leveraging a custom Python database API, to streamline data analysis and trend monitoring.

AWARDS

- 19 scientific publications including 8 first author.
- 2021 Material Research Centre Rose Bowl Award for best doctoral thesis.
- 2016 Master Matériaux Award of the west section of the SF2M for best master's thesis.
- 2022 SUNRISE conference. early career researcher presentation runner-up prize.
- 2020 SUNRISE conference best poster prize.
- 2019 Swansea University School of Engineering 3 minutes thesis winner.
- 2017 Research as Art Imagination and 2018 runner-