Dr James MacMullen

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SUMMARY

PLM and engineering design specialist with a PhD in advanced materials. As an Implementation Consultant, deployed, upgraded and configured PTC Windchill PLM and trained engineers for more than 300 UK companies, from SMEs to GKN Aerospace and BAE Systems, including ITAR-controlled MoD vendors. Hands-on with Creo, SolidWorks and Fusion CAD/CAM, FEA, additive manufacturing and advanced materials testing. From 2019 to 2026 a full-time family carer, staying current through freelance technology writing, Harvard online computer science and AI programmes, and Python AI and robotics projects. Caring responsibilities have now ended; seeking a PLM consultant, solutions or applications engineering role and available to start immediately.

KEY SKILLS

- CAD/CAM: PTC Creo, Autodesk Fusion, SolidWorks, AutoCAD (surfacing, mould design, machining simulation, FEA)
- PLM: PTC Windchill & ThingWorx (implementation, upgrades, data migration, configuration)
- Product development & reverse engineering
- Additive manufacturing
- Advanced materials and product testing
- Thermoplastics & injection moulding
- Technical training, onboarding & documentation
- Superhydrophobic thin films
- Metrology
- Nanoparticulate enhanced smart polymer coatings and treatments
- Welding: MIG, TIG, arc & oxy-acetylene
- Machine tools
- Technical & article writing
- Project management (MS Project)
- Robotics, PCB design & AI integration

SOFTWARE EXPERIENCE

- Programming: Python, C++, C#, JavaScript, HTML & XML
- AI & robotics: NVIDIA Isaac Sim & Isaac Lab; local generative AI (PyTorch, Hugging Face Diffusers); AI-assisted development (Claude Code)
- Materials selection: Cambridge Engineering Selector (CES)
- PCB design: KiCad
- 3D & rendering: Blender, SketchUp, KeyShot, Maxwell Render
- Graphics: Adobe Photoshop & Illustrator, Corel Painter
- Office: Microsoft Office (including MS Project) & Google Workspace
- Operating systems: Windows & Linux

EMPLOYMENT

Family Carer & Freelance Technical Writer

Jan 2019 – 2026

Full-time carer for family members with long-term illnesses; caring responsibilities have now ended. Alongside caring, kept technical skills current through:

- Freelance technical writing for online technology magazines, covering AI, coding and cybersecurity.
- Harvard online programmes in Computer Science and Artificial Intelligence (certified). Final project: a robot arm designed, built and programmed at home.
- Self-directed AI projects in Python, including local generative-AI applications for product mockups and video, and robot simulation in NVIDIA Isaac Sim.

Implementation Consultant – Concurrent Engineering
Sept 2015 – Jan 2019

Implemented PTC's Windchill Product Lifecycle Management (PLM) system, which controls versions of CAD parts, assemblies and documentation, for engineering companies across the UK, working on site and remotely.

- Supported more than 300 engineering companies, from SMEs to Triumph, GKN Aerospace and BAE Systems.
- Installed, upgraded and migrated Windchill, including moves between Microsoft SQL Server and Oracle databases, on physical and virtual infrastructure from single servers to clustered, multi-tier and multi-site deployments.
- Configured Windchill to each client's processes and integrated third-party tools such as preview publishing software.
- Delivered official PTC training in PLM, CAD/CAM and FEA simulation, and designed custom training, onboarding pathways and branded documentation for client-specific workflows.
- Used training engagements to solve live engineering problems as proofs of concept, such as FEA of the thermo-mechanical performance of radiator panels and completing mould tooling for a next-day deadline.
- Rebuilt document templates and workflows for PLM rollouts, including for MoD vendors working under International Traffic in Arms Regulations (ITAR) controls.
- Project-managed larger implementations: liaised with client counterparts, ran weekly progress calls, kept Gantt charts in MS Project, wrote reports and arranged MoD vendor security checks for the team.

Lecturer of Mechanical & Design Engineering – University of Portsmouth
June 2014 – Sept 2015
Promoted from University Tutor in recognition of active research. Member of the Advanced Polymer and Composites (APC) and Engineering Design research groups; supervised a PhD student.

- Published 11 peer-reviewed journal papers (2011–2014) on nanoparticulate smart polymer coatings and biofouling.
- Led materials testing, reverse engineering and fault analysis for industry, including MWCNT fuel cell membranes, smoke sensors, silane/siloxane, sustainable and metal thin-film coatings, and injection-moulded medical and automotive parts.
- Industry partners included Safeguard Europe, Gurit, Pall Europe, Toyota, KCC and EcoDrift, with design projects for Ellis Day, Equisift, Innovative Designs IOW Ltd and New Forest Biscotti.
- Testing: SEM with EDAX, nanoindentation, thermal diffusivity and conductivity, TGA, DSC, pendulum impact, surface roughness, Vickers hardness, microscopy, noise level, and goniometry (contact angle, surface tension and surface energy).

EDUCATION & PUBLICATIONS

PhD – Nanoparticulate Polymer Coatings, University of Portsmouth (2013)
MSc Technology Management (Distinction), University of Portsmouth (2009)
BSc (Hons) Product Design & Modern Materials (First Class), University of Portsmouth (2009)
Fellow of the Higher Education Academy (FHEA), 2013
Publications: 11 peer-reviewed journal papers (2011–2014) in journals including Construction and Building Materials, Energy and Buildings, and Building and Environment; 2 book chapters; 5 conference and seminar presentations; 1st and 2nd prizes for best research poster. Full list available on request.

HOBBIES AND INTERESTS

Making: Building robots, combining 3D printing, PCB design, coding, control systems and AI.
Sport: Won the 2005 American Open in WTF Taekwondo (heavyweight division) and have taught classes.