



Job title	Research Associate / Fellow in Power Electronics	Job family and level	Research and Teaching Level 4
School/ Department	Engineering – PEMC	Location	Jubilee Campus

Purpose of role

The successful candidate will conduct an original, nationally and internationally recognised research in Power Electronics and Drives within the Power Electronics, Machines and Control Research Centre. The successful candidate will propose new design for DC-DC converters, inverters, controller for high-speed motor drives and reliability assessment of semiconductor devices especially considering future aerospace applications.

	Main responsibilities (Primary accountabilities and responsibilities expected to fulfil the role)	% time per year
1	Technical work details • Work closely with the researchers from PEMC Institute and the industry partner to develop hardware and software for the design, development, and testing of high-power-density converters. • Develop simulation models for converters. • Conduct power cycling, temperature cycling and other relevant reliability tests • Develop control algorithms and validate them with hardware. • Implement a demonstrator high efficiency system • Design controller circuits • Develop the control hardware on a validation rig. • Support the manufacturing of a demonstrator converter and test rig. • Verification of the system on custom test rig replicating in-use conditions.	70%
2	Production of reports, presentations and meetings with industrial partners and outreach to the industry, scientific community and general public. Facilitate the growth of the PEMC Research Group through research excellence and contributing in writing proposals to attract funding from research organisations such as EPSRC, Innovate UK, EU Horizon and industry.	10%
3	Dissemination of results ▪ Writing of research reports and papers in order to disseminate research results. ▪ Develop a track record of published research findings in internationally-respected peer-reviewed journals where suitable.	10%

4	Industrial Support/Project Management ▪ Maintain regular contact and act as a technical contact with industrial sponsors and respond to enquiries. ▪ Attend meetings at sponsors sites as required.	10%
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Person specification

	Essential	Desirable
Personal skills	• Be able to build strong alliances with colleagues and stakeholders and engage effectively with personnel in a wide range of roles. • Be a self-motivated proactive individual able to work to tight timescales, either alone or as a member of a larger team. • Be enthusiastic and self-motivated with the drive to embed new knowledge and take full ownership of the project and see it through to resolution. • Have a “can do” attitude and demonstrate a passion for new technology and learning. Be adaptive to change in a dynamic working environment.	• Have the ability to plan a project, execute the plan and make adjustments according to delays and technical issues. • Be able to explain technical concepts to non-technical people. Have a demonstrable aptitude for innovation
Knowledge and experience	▪ Outstanding and comprehensive knowledge of DC-DC converters, inverters and drives ▪ Experience and knowledge of FPGA or DSP based controller design ▪ Practical, hands-on experience in the design, construction and testing of electrical/electronic circuits with real-time programmers. ▪ Expert user of MATLAB and Simulink ▪ Experience of writing reports and conducting effective research	▪ Experience of design and analytical modelling and control of power electronics converters ▪ Relevant experience in a research environment ▪ Knowledge of digital controller simulation and implementation from scratch ▪ Awareness and understanding of reliability issues of aerospace converters ▪ Experience of conducting power cycling and temperature cycling tests ▪ Experience with customer engagements and building relationships ▪ Knowledge of circuit design software and signal processing techniques ▪ Familiarity with CAD tools such as PLECS or LTspice
Qualifications, certification and training (relevant to role)	▪ Good (2.1 or higher) first degree (or equivalent) in electrical / electronic engineering or a related subject. ▪ PhD or equivalent (or near completion) in electrical / electronic engineering and research experience in converters, motor drives and control	▪ Post-doctorate or industrial research on Electrical motor drives or closely related discipline.



Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University's strategy, vision and values. The following are essential to the role:

Valuing people	Is always equitable and fair and works with integrity. Proactively looks for ways to develop the team and is comfortable providing clarity by explaining the rationale behind decisions.
Taking ownership	Is highly self-aware, looking for ways to improve, both taking on board and offering constructive feedback. Inspires others to take accountability for their own areas.
Forward thinking	Driven to question the status quo and explore new ideas, supporting the team to "lead the way" in terms of know-how and learning.
Professional pride	Sets the bar high with quality systems and control measures in place. Demands high standards of others identifying and addressing any gaps to enhance the overall performance.
Always inclusive	Ensures accessibility to the wider community, actively encouraging inclusion and seeking to involve others. Ensures others always consider the wider context when sharing information making full use of networks and connections.

Key relationships with others



