Title: Real Time Simulation of Permanent Magnet Synchronous Motors (PMSMs) and PMSM Drives

Type of award: PhD Research Studentship

Department: Electrical & Electronic Engineering

Scholarship Details: If awarded the University’s Doctoral Training Programme award combined with this project sponsorship will offer the successful candidate:

- full UK/EU PhD tuition fees
- a tax-free bursary of £14,553 p.a. (in 2017/18) and
- an industrial top-up of £4,000 p.a. (subject to contracts)
- internship
- a PhD that will be affiliated to the UK Centre for Power Electronics, facilitating exchange of ideas with the wider PhD and academic community.

Duration: 3.5 years

Eligibility: UK/EU applicants only who have been resident in the UK for 3 years prior to September 2017

Start Date: From September 2017

PhD Topic Background/Description

High torque motors are a disruptive technology currently revolutionising the automotive industry. Their application includes hybrid and electric propulsion to produce cleaner and more efficient vehicles plus other improvements achieved by replacing hydraulic with electric actuation e.g. for power steering and active anti-roll systems. Vehicle manufacturers and their suppliers require computer simulation models that can be used to predict performance early on in the design process, plus models that are able to run in real-time to support the system integration and test tasks.

The focus of this research project will be on developing improved ways to model and simulate PMSM motor drives in real time, making use of MATLAB and supporting tools which are widely used by the automotive industry. As industrial sponsors for this EPSRC CASE Studentship, MathWorks Ltd will provide assistance in best use of MATLAB, Simulink and Simscape plus access to high-end real time microprocessor-based and FPGA-based hardware. This project offers a unique opportunity for the research student to develop skills and knowledge that will provide a springboard for a career in academia, industry or computer-based simulation tools.

You will be joining a multi-disciplinary team of PhD students, post-doctoral researchers and academics in the Electrical Energy Management Group at the University of Bristol (http://www.bris.ac.uk/engineering/research/em/) led by Prof Phil Mellor. This group has extensive expertise in the design, characterisation, build and test of high performance electric machines and power converters for a range of modern, energy efficient applications, for example aerospace.
electric power systems (SAFRAN POWER SYSTEMS, LEONARDO HELICOPTERS, AIRBUS), automotive electric and hybrid drivetrains (JAGUAR LAND-ROVER, QINETIQ).

URL for further information:
(http://www.bris.ac.uk/engineering/research/em/)

**Candidate Requirements**

An **essential requirement** is a good undergraduate degree (1st, 2:1 or equivalent) in electrical/electro-mechanical/mechatronics engineering (or a closely related subject).

**Scholarship Details**

Scholarship covers full UK/EU (EU applicants who have been resident in the UK for 3 years prior to September 2017) PhD tuition fees and a **tax-free** stipend at the current RCUK rate £14,553 (in 2017/18) plus an additional ‘top-up’ by the industrial partner of £4,000 p.a. (subject to contracts).

**Informal enquiries**

Please contact Dr Drury, d.drury@bristol.ac.uk or 0117 9545390

For general enquiries, please email gsen-pgrs@bristol.ac.uk

**Application Details**

To apply for this studentship submit a PhD application using our [online application system](http://www.bristol.ac.uk/pg-howtoapply)

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the Electrical & Electronic Engineering Department” and specify the title of the scholarship in the “other” box below with the name of the supervisor Dr Drury.

**Apply now**