Title: Novel Sensors for Electric Actuators and Propulsion 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 for the academic year 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

This PhD will focus on developing a rigorous understanding of the operation of state-of-the-art existing generators across a range of domains (mechanical, electrical and thermal). Adding “smart” functionality to these machines requires models that can inform control systems of the operating regime, predict lifetime and failures and adapt to changes in requirements in near real-time. The successful candidate will be involved in developing a series of these models based upon a combination of finite-element analysis and experimental testing.

This is an integral part of increasing the presence and impact of electrical technologies in civil airliners and will also result in:

- weight and/or volume reduction through performance optimisation
- reduced maintenance and through-life costs
- improved functionality (intelligent operation/actuation)

PhD Specific Aims/Objectives

The first part of this PhD will focus on ways of measuring machine quantities such as:

- stator and rotor voltages and currents
- component temperatures

whilst the machine is in operation, rotating at speeds.

The second aspect will look at ways in which the data that is being captured can be used to add intelligence to the controller associated with the machine to improve its operation and reliability in
service and to assist system design optimisation. This will focus on developing a series of adaptable, lumped parameter, electro-thermo-mechanical models that can be implemented in a discrete form on a real-time architecture. Validation of the models will be performed using existing production hardware, modified and instrumented as necessary.

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 mechanical/electrical/electro-mechanical/mechatronics engineering (or a closely related subject).

Experience of any/all of the following areas would be advantageous to the successful candidate:

- Mechanical design and build
- Understanding of heat transfer concepts
- Modelling of dynamic systems
- Using sensors, instrumentation and data capture systems
- Knowledge of relevant software environments (Inventor, MATLAB/Simulink, dSPACE, FEMM)

**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 phone 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](http://www.bristol.ac.uk/pg-howtoapply)