Title: Design & prediction of irregular inductive sensors

Type of award  PhD Research Studentship
Department  Mechanical Engineering
Scholarship  Minimum £15,009 p.a. subject to confirmation
Overseas applicants must be self-funded
Funding Duration  3.5 years
Eligibility  Home /EU / Overseas
Start date  October 2020

PhD Topic Background/Description
The Ultrasonic and Non-Destructive Testing (UNDT) research group is seeking a high-calibre candidate to undertake a challenging PhD research project in the field of electromagnetic inductive sensing with applications in non-destructive testing (NDT) and soft robotics.

Applicants with an interest in industrial NDT, soft-robotics, electronics & electromagnetics, programming, mathematics or finite element modelling are encouraged to apply.

Inductive sensors (coils) are widely used in a range of applications from non-destructive testing to robotic sensing applications for measuring and characterising materials. The geometry of inductive sensing coils has remained broadly the same for the past century, i.e. predominantly axially symmetric. With the recent introduction of more sophisticated coil fabrication technologies, arbitrary-shaped coil elements as well as soft deformable coils can now be manufactured, while advances in computing power allow for the faster analysis of more complex 3D geometries. However, research into how geometric asymmetry and irregularity affects the electrical properties and magnetic field morphology of inductive sensors, has yet to be conducted.

The design, modelling and validation of irregular coils will form the focus of the PhD project with potential applications in the design & optimisation of irregular coil geometries for non-destructive testing (NDT), as well as for the self-sensing of deformable coil geometries in soft-robotics.

As part of the UNDT group and associated FIND centre for doctoral training, you will have access to a wide range of courses and networking events to help develop as a researcher, as well as significant interaction with supporting industrial partners.

Further Particulars

Candidate Requirements
We are looking for committed and highly-motivated applicants holding (or close to completing) a minimum of a master’s degree (or international equivalent) with an achieved (or projected) 1st or high 2:1 degree in a physics, mathematics, electrical engineering or other appropriate engineering discipline.
You should have strong mathematical and programming skills and be fluent in written and spoken English. If English is not your first language, please provide a recognised English language qualification at Profile E. Further information: http://www.bristol.ac.uk/study/language-requirements/profile-e

An understanding of the fundamental principles of electromagnetics is desirable, while additional experience in finite element modelling, electronics or data/image analysis would be beneficial.

Equal opportunities statement:

We seek an inclusive environment that respects the diversity of our staff and students and enables them to achieve their full potential, to contribute fully, and to derive maximum benefit and enjoyment from their involvement in the life of the University. We are committed to building and sustaining an excellent learning experience for our students, where staff are equally valued and respected, and students are inspired to thrive academically.

Scholarship Details
Scholarship covers full UK/EU (EU applicants who have been resident in the UK for 3 years prior to 1st September 2020) PhD tuition fees and a tax-free stipend at the current RCUK rate (£15,009 in 2019/20) subject to confirmation. Overseas applicants must be self-funded.

Informal enquiries
To enquire about opportunities, please send a CV and cover letter to Dr Robert Hughes (Robert.hughes@bristol.ac.uk) stating your interests and aims for the PhD.

For general enquiries, please email came-pgr-admissions@bristol.ac.uk

Application Details
Prior to application please send a CV and cover letter to Dr Robert Hughes (Robert.hughes@bristol.ac.uk) along with details of your funding status. If you do not have funding lined-up, suitable sources of funding will be identified after an interview which the applicant will need to apply for based on the project.

To apply for this studentship, submit a PhD application using our online application system [www.bristol.ac.uk/study/postgraduate/apply]

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