Title: SiC Power Electronic Conversion for Wind Power

Type of award  PhD Research Studentship

Department  Electrical and Electronics Engineering, EEMG Research Group

Scholarship Details  Minimum £18,000 p.a. subject to eligibility status.

Duration  4 years

Eligibility  Home (UK) and EU citizens who have confirmation of UK settlement or pre-settlement status under the EU Settlement Scheme.

Start Date  From December 2021

PhD Topic Background/Description

Would you like to address the challenges of reducing carbon dioxide emissions by enhancing energy efficiency in wind turbines, and by making optimising different aspects of the whole power train? Are you interested in renewable energy and the technology that turns a variable supply of electricity into the reliable flow of power that users require? With emerging wide-bandgap power semiconductor devices, a step-change in switching speeds is looming, where the core of power management equipment is going to drastically shrink and become more efficient. International companies are in need of experts in this emerging field of power electronic engineering.

Emerging high-speed SiC and GaN power semiconductor devices offer significant design and performance-based benefits over existing devices and will dramatically improve power conversion systems in electric vehicles and renewable power generation. SiC technologies have evolved to the point where they could be used the multi-megawatt offshore wind turbines of the future. However, research is needed to learn how to maintain SiC devices’ ultra-fast switching, which is what makes them so efficient, in a system that is used to slower silicon power devices.

A PhD study offers a unique opportunity to develop in-depth skills and knowledge that will provide a springboard for further career progression. This PhD will investigate high-speed gate drivers, sensing, control, including the latest SiC modules. You will be part of a larger project funded by a Wind Power company, and through this gain valuable insight into the cutting-edge of industrial R&D in this area. You will also use novel components developed by the Bristol Electrical Energy Management (EEMG) research group. The EEMG is a multi-disciplinary team of PhD students, post-doctoral researchers and academics who have developed some of the world’s fastest GaN circuits, gate drivers, and lowest-power electronic sensors. Together, we develop new applications and techniques to help companies adopt these emerging power electronic technologies, and make energy use more efficient.

URL for further information: https://www.bristol.ac.uk/engineering/research/em/
Further Particulars

Candidate Requirements
Applicants must hold/achieve a minimum of a master’s degree (or international equivalent) in electrical and electronics engineering. Applicants without a master’s qualification may be considered on an exceptional basis, provided they hold a first-class undergraduate degree. Please note, acceptance will also depend on evidence of readiness to pursue a research degree.

Excellent analytical skills and experimental acumen are essential.

If English is not your first language, you need to meet this profile level:
Profile E
Further information about English language requirements and profile levels.

Scholarship Details
This is a fully funded 4-year studentships covering:
- Minimum £18,000 tax-free stipend per year for living expenses
- tuition fees at UK student rates
- equipment and travel allowance to support research related activities.

For EPSRC funding, students must meet the EPSRC residency requirements.

Informal enquiries
For questions about the research topic please contact Dr Saeed Jahdi and Prof Bernard Stark on saeed.jahdi@bristol.ac.uk and Bernard.Stark@bristol.ac.uk
For questions about eligibility and the application process please contact SCEEM Postgraduate Research Admissions sceem-pgr-admissions@bristol.ac.uk

Application Details
Prior to any application, please contact Dr Saeed Jahdi to discuss your research proposal to see if it aligns with their current research. No indication of an offer can be made until a completed application has been received.

To apply for this studentship, submit a PhD application using our online application system

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the Electrical and Electronics Engineering Department” and specify the title of the scholarship in the “other” box below along with the name of the supervisor. Interested candidates should apply as soon as possible.