Candidate Information

Position:	Research Fellow in Power Electronics
School/Department:	Energy, Power and Intelligent Control
Reference:	21/109005
Closing Date:	Monday 2 August 2021
Salary:	£33,797 - £40,322 per annum
Anticipated Interview Date:	Thursday 12 August 2021
Duration:	FTC for 18 months or until 28 February 2023 whichever is soonest

JOB PURPOSE:

To develop and design a power converter for the integration of wind turbines with medium voltage direct current (MVDC) grids. This will be carried out as part of a research team, within an exciting, prestigious new project funded by the Engineering and Physical Sciences Research Council (EPSRC), aiming to 1) implement a power converter with the view to maximising efficiency and minimising the overall size, 2) develop a modulation technique which optimises the operation of the converter and 3) develop a controller that ensures stability during normal and abnormal conditions. This is a unique opportunity to build the next generation of renewable energy interfaces and work at one of the leading institutions in the United Kingdom, Queen's University Belfast, collaborating with a team of academics and industry. The successful candidate will become an active member of the Energy, Power and Intelligent Control (EPIC) research centre within the School of Electronics, Electrical Engineering and Computer Science (EEECS), contributing to word leading research outputs and completely new research initiatives in the broader area of Power Electronics and Renewable Energy Conversion.

MAJOR DUTIES:

1. Design, development and experimental implementation of a novel power converter for wind power applications.
2. Use MATLAB/Simulink, PLECS and other software to carry out design optimisation, finite element analysis and performance analysis of the converter.
3. Maintain a systematic record of research outcomes.
4. Evaluate the performance of the proposed solutions in a software environment and a laboratory experiment.
5. Work closely with the project partner, attend project meetings and cross-leverage their complementary expertise.
6. Present regular progress reports on research to members of the research group or to external audiences to disseminate and publicise research findings.
7. Prepare in collaboration with the supervisor the material for high-quality publications in national and international journals and presentations at international conferences.
8. Carry out routine administrative tasks associated with the research project/s to ensure that the project is completed on time and within budget. These might include the organising of the project meetings and documentation, risk assessment of research activities.

Planning and Organising:

1. Plan for the use of research resources, laboratories and workshops.
2. Plan own day-to day activity within the framework of the agreed research programme.
3. Plan and meet deadlines for journal publications, prepare presentations and papers for conferences.
4. Coordinate and liaise with other members of the research group over work progress.

Resource Management Responsibilities:

1. Ensure research resources are used in an effective and efficient manner.
2. Provide guidance as required to support staff and any students who may be assisting with research.

Internal and External Relationships:

1. Liaise on a regular basis with colleagues and students in EPIC, the School of EEECS and faculties in QUB to build research collaborations.
2. Build internal contacts and participate in internal networks for the exchange of information and to form relationships for future collaboration.
3. Join external networks to share information and ideas.
4. Contribute to the School's outreach programme by establishing links with local community groups, industries etc.

ESSENTIAL CRITERIA:

1. Hold, or about to obtain, a PhD in Power Electronics, Electronic/Electrical Engineering or closely related discipline.
2. At least 3 years' demonstrable and relevant research experience in the broad area of power electronics, power converter architectures and control.
3. Evidence of a strong publication record commensurate with career stage and experience in the proceedings of international conferences and journals (such as IET and IEEE Transactions etc).
4. Demonstrable knowledge/skills in Power Electronics design software, including packages such as MATLAB/Simulink.
5. Programming skills including software for programming DSP, PSoC, or FPGAs control platforms.
6. Ability to contribute to broader management and administrative processes.
7. Contribute to the School's outreach programme by links with industry, community groups etc.
8. Sufficient breadth and depth of specialist knowledge in the discipline and of research methods and techniques to work within established research programmes.
9. Good written and verbal communication skills with an ability to communicate complex information clearly via presentations, reports etc.
10. Ability to innovate and rapidly contribute to research projects.
11. Ability to assess and organise resources.
12. Ability to meet the mobility requirements of the post, in particular a willingness to travel both within the UK and outside for collaborative visits, attending and presenting at conferences.

DESIRABLE CRITERIA:

1. Practical experience in implementation and testing of power electronics converters.
2. Knowledge in modelling of device power losses and associated thermal analysis.
3. Knowledge in electromagnetic compatibility and design of EMI filters.
4. Any experience contributing to student project supervision.
5. Experience in meeting deadlines in producing technical documents.
6. Experience in presenting at conferences, workshops, seminars, tutorials etc.
7. Experience of collaborative research or working in a team.