

THE POST

College:	College of Engineering, Mathematics and Physical Sciences http://emps.exeter.ac.uk/
Post:	Postdoctoral Research Associate / Postdoctoral Research Fellow
Reference No:	P57140
Grade:	E/F
HERA:	ARF/RFEL
Reporting To:	Dr Mohammad Abusara

The post is available from 1st October 2018 to 31st May 2020 and is part of a project involving the University of Exeter. It is funded through the European Regional Development Fund and forms part of the European Structural Investment Framework for Cornwall & the Isles of Scilly.

You will be a member of the Renewable Energy Group in the College of Engineering, Mathematics & Physical Sciences, based in Cornwall.

Job Description

Main purpose of the job:

This research position will support the successful ERDF 'CNE' and Interreg 'ICE' project applications. *Cornwall New Energy (CNE)* project aims to provide business support to small and medium enterprises and community groups in Cornwall and the Isles of Scilly to enable them to plan towards installing renewable energy systems, adopt low carbon and environmental goods and services, develop innovations in the low carbon and environmental goods and services sector, access new market opportunities, improve their economic/environmental performance amongst other outcomes. The *Intelligent Community Energy project (ICE)* aims to design and implement innovative smart energy solutions for isolated territories in the UK-France Channel area.

The post holder will join a strong research group in Renewable Energy with extensive physical and computational facilities and excellent support staff. The research area that will be investigated in both projects straddles power electronics, control, and artificial intelligence.

The post-holder will contribute to the development of a 100kW bi-directional power electronic converter for battery storage. The converter would allow injecting power from the battery into the grid and vice-versa. The research work will include carrying out different task including, mathematical modelling, numerical simulation, electrical wiring and testing. The work will also include developing a CAN-bus communication protocol between the power electronic converter and the battery management system.

This position will also include the development of an energy management system for microgrids. The management system will use available current and previous power data from installed renewable energy sources and weather forecast to predict the short term electric energy price and hence optimise the operation of the battery storage. The management system will be based on artificial intelligence and machine learning techniques.

Applicants will have extensive knowledge in system modelling and control. Knowledge in artificial intelligence and machine learning is essential. The post-holders will contribute to team decision making and use creativity to analyse and interpret research data to generate original ideas based on outcomes leading to the publication of research of international standing and quality. Ideally, the candidate will have been active in the field of power electronics and artificial intelligence, with enthusiasm for interdisciplinary solutions.

Furthermore, the Research Associate/Fellow will work with collaborating business partners and organisations in the CNE project. As part of the *ICE project* the post-holder will also liaise with UK and French project partners. The post holder will work closely with appointed academic supervisors, business partners, delivery partners, and members of the University's Impact, Innovation and Business (IIB) directorate to achieve the objectives of the CNE and ICE projects.

POSTDOCTORAL RESEARCH ASSOCIATE

Main duties and accountabilities:

1. To undertake research as appropriate to the field of study including:
 - Desk-top analysis of existing scientific literature;
 - Writing up research work for publication;
 - Developing research objectives and proposals for own or joint research;
 - Making presentations at national and international conferences and similar events;
 - Dealing with problems which may affect the achievement of research objectives and deadlines;
 - Analysing and interpreting the results of own research and generating original ideas based on outcomes;
 - Using new research techniques and methods;
 - Using initiative and creativity to identify areas for research, developing new research methods and extending the research portfolio;
 - Using creativity to analyse and interpret research data and draw conclusions on the outcomes.
2. To undertake research activities and work in collaboration with colleagues (business and academic) as appropriate including:
 - Contributing to collaborative decision making within the research group;
 - Contributing to the production of collaborative research reports and publications.
 - Preparing papers and presenting information on research progress and outcomes to bodies supervising research, e.g. steering groups.
3. To communicate complex information, orally, in writing and electronically.
4. To engage in knowledge exchange activities with collaborating businesses and partner, supporting knowledge and skills transfer and CPD
5. To prepare proposals and applications to external bodies, e.g. for funding and contractual purposes
6. To contribute to the planning of future projects.
7. To use research resources, laboratories and workshops as appropriate and to take responsibility for conducting risk assessments, reducing hazards and for the health and safety of others.
8. To monitor research budgets as appropriate.
9. To contribute to teaching and to be involved in the assessment of student knowledge including assisting in the supervision of student projects and in the development of student research skills.
10. To engage in continuous professional development and to be responsible for continually updating knowledge and understanding in field of study or specialism and for developing skills.

This job description summarises the main duties and accountabilities of the post and is not comprehensive: the post-holder may be required to undertake other duties of similar level and responsibility. Please visit the Human Resources website to view the Research Fellow role profiles.

Person Specification – Post doctoral Research Associate

Competency	Essential	Desirable
Attainments/Qualifications	PhD (or nearing completion) OR equivalent qualification/experience in a related field of study.	
Skills and Understanding	Sufficient knowledge in the discipline and of research methods and techniques to work within established research programmes. Matlab/Simulink and high level language programing.	Evidence of research activity and published research. Communication protocols such as CAN bus
Prior Experience	Experience in artificial intelligence and machine learning techniques. Understanding of power electronics and control	Experience of undergraduate teaching
Behavioural Characteristics	Excellent written and verbal communication skills. Able to communicate material of a specialist or highly technical nature. Able to manage research and administrative activities and to balance the competing pressures of research and administrative demands and deadlines. Able to liaise with colleagues and students. Able to build contacts and participate in internal and external networks for the exchange of information and collaboration. Able to identify potential sources of funding. Actively participate as a member of a research team. Engage in continuous professional development. Understand equal opportunity issues as they may impact on areas of research content. Where appropriate to the role, willingness to undergo training in order to conduct risk assessments.	
Circumstances	Project management experience, Willing to work flexibly to achieve project demands	Previous experience working in the Renewable Energy sector

POSTDOCTORAL RESEARCH FELLOW

Main duties and accountabilities:

1. To undertake research as appropriate to the field of study including. The responsibilities may include all or some of the following:
 - Desk-top analysis of existing scientific literature;
 - Developing research objectives and proposals for own or joint research;
 - Making presentations at national and international conferences and similar events;
 - Dealing with problems which may affect the achievement of research objectives and deadlines;
 - Analysing and interpreting the results of own research and generating original ideas based on outcomes;
 - Using new research techniques and methods;
 - Using initiative and creativity to identify areas for research, developing new research methods and extending the research portfolio;
 - Using creativity to analyse and interpret research data and draw conclusions on the outcomes.
 - Identifying sources of funding and contributing to the process of securing funds;
 - Extending, transforming and applying knowledge acquired from scholarship to research and appropriate external activities;
 - Writing or contributing to publications or disseminating research findings using media appropriate to the discipline;
 - Assessing, interpreting and evaluating outcomes of research;
 - Developing new concepts and ideas to extend intellectual understanding;
 - Resolving problems of meeting research objectives and deadlines;
 - Developing ideas for generating income and promoting research area;
 - Developing ideas for application of research outcomes;
 - Deciding on / following research programmes and methodologies, often in collaboration with colleagues and sometimes subject to the approval of the head of the research programme on fundamental issues.
2. To undertake research activities and act as research team leader including:
 - Mentoring colleagues with less experience and advising on their professional development;
 - Coaching and supporting colleagues in developing their research techniques;
 - Supervising the work of others, for example in research teams or projects;
 - Developing productive working relationships with other members of staff;
 - Co-ordinating the work of colleagues to ensure equitable access to resources and facilities;
 - Dealing with standard problems and help colleagues to resolve their concerns about progress in research.
2. To routinely communicate complex and conceptual ideas to those with limited knowledge as well as to peers using high level skills and a range of media and to present the results of scientific research to sponsors and at conferences.
4. As determined by the nature of the project and at the direction of the PI, to plan, co-ordinate and implement research programme activity including:
 - Managing the use of research resources and ensure that effective use is made of them;
 - Monitoring and reporting on the use of research budgets;
 - Helping to plan and implement commercial and consultancy activities;
 - Where appropriate, to plan and manage own consultancy assignments.
5. To engage in knowledge exchange activities with collaborating businesses and partner, supporting knowledge and skills transfer and CPD
6. To contribute to the planning of future RD&I projects.
7. To contribute to teaching and learning programmes in the School and to supervise postgraduate research students.

8. To engage in continuous professional development and to be responsible for continually updating knowledge and understanding in field of study or specialism and for developing skills.

This job description summarises the main duties and accountabilities of the post and is not comprehensive: the post-holder may be required to undertake other duties of similar level and responsibility. Please visit the Human Resources website to view the Research Fellow role profiles.

Person Specification – Postdoctoral Research Fellow

Competency	Essential	Desirable
Attainments/Qualifications	PhD or equivalent qualification/experience in a related field of study.	Be a nationally recognised authority in the subject area.
Skills and Understanding	<p>Possess sufficient specialist knowledge in the discipline to develop/follow research programmes and methodologies.</p> <p>Record of research output in high quality publications.</p> <p>Matlab/Simulink and high level language programing such as C/C++.</p> <p>Familiar with Texas Instrument DSP families.</p>	<p>Evidence of research activity and published research.</p> <p>Communication protocols such as CAN bus</p> <p>Embedded DSP software programming.</p>
Prior Experience	Experience of managing research projects and research teams.	<p>Experience of undergraduate /postgraduate teaching and supervision.</p> <p>Experience of acting as principal investigator on research projects.</p>
Behavioural Characteristics	<p>Excellent written and verbal communication skills.</p> <p>Able to communicate complex and conceptual ideas to a range of groups.</p> <p>Evidence of the ability to collaborate actively within the Institution and externally to complete research projects and advance thinking.</p> <p>Able to participate in and develop external networks.</p> <p>Able to balance the pressures of research, administrative demands and competing deadlines.</p>	Able to identify sources of funding, generate income, obtain consultancy projects, or build relationships for future activities.
Circumstances or Additional Competencies/Experience	<p>Managerial experience.</p> <p>Willing to work flexibly to achieve project demands.</p>	Worked in Renewable Energy sector.

Terms & Conditions

Our Terms and Conditions of Employment can be viewed [here](#).

Further Information

Please see our [website](#) for further information on working at the University of Exeter.