

Research Associate

Department	Electronic and Electrical Engineering (www.strath.ac.uk/engineering/electronicalelectricalengineering/)		
Faculty	Faculty of Engineering (www.strath.ac.uk/engineering/)		
Staff Category	Research	Reference No	342167
Reports To	Prof C Booth via Dr Q Hong	Grade:	7
Salary Range:	£32817 - £39,151	Contract Type:	Fixed Term (36 months)
FTE:	1 (35 hours/week)	Closing Date	Friday, 15 January 2021

Job Advert

The Department of Electronic and Electrical Engineering is seeking a highly motivated and skilled Research Associate in the area of power system monitoring, protection and control, ideally with background and experience in multi-energy systems. You will be a core part of a research team delivering a research programme funded by the Engineering and Physical Sciences Research Council (EPSRC), in conjunction with the National Natural Science Foundation of China (NSFC) led by Professor Campbell Booth (Head of Department) and Dr Qiteng Hong (Strathclyde Chancellor's Fellow and Lecturer). The research project is entitled "Resilient Future Urban Energy Systems Capable of Surviving in Extreme Events (RESCUE)"¹. This project is a consortium project, led by the University of Strathclyde for the UK-side of partnership, with partners including the University of Manchester, and supported by stakeholders including BELECTRIC, the Energy Networks Association, Scottish and Southern Energy (SSE), SP Energy Networks, ScottishPower Renewables and Synaptec. The Chinese academic partners are Tsinghua University and Xi'an Jiaotong University – two of the foremost universities in China and globally in the power and energy systems domains.

The project is concerned with enhancing the capability of future urban energy systems, which may operate in grid-connected, islanded or multiple-islanded modes, to survive in extreme and degraded conditions; when in islanded/multi-islanded mode. The energy systems would be expected to purely employ local energy and storage resources, ideally without compromising system resilience or security of supply. You will play a key role in the development of monitoring, protection and control schemes for assessing and enhancing the system resilience. You will apply advanced measurement and ICT techniques (e.g. distributed sensing techniques, phasor measurement units, etc.) and develop algorithms and models that are capable of real-time evaluation of the system's resilience level, highlighting potential weakness and quantifying the risks facing the energy system. You will consider the radically different electrical system dynamics when interfaced with energy resources from other vectors, investigate the potential impact on power system behaviour (with a focus on protection systems), and contribute to the development of new protection and fault locating schemes that could mitigate any identified protection challenges. You will also be responsible for researching the characteristics and capabilities of different resources in supporting system operation during stress events with detailed consideration of the frequency and voltage characteristics in a system with low or no inertia, and develop coordinated control schemes so that optimised overall control actions can be deployed. You will also be involved with the development of novel algorithms that identify optimal boundaries for splitting the system into smaller islands when required to maximise survivability in extreme situations, and, in the worst-case, to facilitate restoration.

You will have access to the world leading facilities at the University of Strathclyde (the dynamic power systems/microgrid laboratory and the Power Networks Demonstration Centre) to test and refine developed methodologies in a realistic environment. Supported by the project programme, you will be interacting and collaborating with internationally-leading research organisations and industrial partners and potentially have the opportunity to arrange short term placements with the partner organisations. There will be international travel involved in the role (assuming relaxation of any travel restrictions that may be in

¹ <https://gow.epsrc.ukri.org/NGBOViewGrant.aspx?GrantRef=EP/T021829/1>

place due to Covid-19). In addition, you will benefit from personal development opportunities offered by the University of Strathclyde.

To be considered for the role, you will be educated to a minimum of PhD* level in the area of power system monitoring, protection and control - ideally with experience on multi-vector and future energy systems, and/or have significant relevant industrial experience in these areas in addition to a relevant first or Master's degree. You will need to be able to conduct individual research work, disseminate results in top international conferences and journal publications. You will also have an ability to work within a team environment and supervise the work of others.

*Whilst a Research Associate is ideally sought for this position, applications from candidates who are close to completing a PhD are also welcome. In such circumstances, appointment will be made at grade 6 level (Research Assistant) and duties and grade will be revised accordingly.

Job Description

Brief Outline of Job:

You will be the main researcher conducting Strathclyde's research activities in the RESCUE project as outlined above and are responsible for engaging and collaborating with academic and industrial partners to achieve the project deliverables, more specifically:

Main Activities/Responsibilities:

1.	Develop real-time and/or offline representative energy system models including resources from multiple energy vectors
2.	Develop methods and tools that can make use of novel measurement and ICT techniques to evaluate the resilience of the future energy system in real time and enable proactive actions
3.	Develop coordinated control schemes that are capable of fully exploiting and coordinating the energy resources with different characteristics and capabilities in a system fully supported by local energy resources from different vectors
4.	Development of algorithms that could identify the optimal boundaries for splitting the energy system during extreme events to maximise the survivability of the overall system.
5.	Aid in the investigation of protection issues in a system fully supported by local energy sources and support the development of novel protection and fault location schemes for such energy systems.
6.	Play a key role in supporting the research team management, e.g. developing the team's research objectives and plan, contributing to the lab development, identifying opportunities for team growth, etc.
7.	Write up research work for publication, individually or in collaboration with others, and disseminate results in top journal publications and presentation at international conferences and working groups.
8.	Engage with industrial partners and international research organisations and universities to keep at the forefront of research, disseminate results, collaborate and inform the development of research objectives.
9.	Participate in meetings and workshops to disseminate the results of the RESCUE project.
10.	Participate in research meetings, visits and short-term placements with industrial partners and research organisations.
11.	Where appropriate and agreed, identify sources of funding and contribute to the securing of fund for research, including drafting grant proposals and planning for future proposals.
12.	Collaborate with colleagues on the development of knowledge exchange activities by, for example, participating in initiatives which establish research links with industry and influence public policy and the professions.
13.	Supervise student projects, provide advice to students and contribute to teaching as required by, for example, running tutorials and supervising practical work.
14.	Contribute in a developing capacity to Department/School, Faculty and/or University administrative and management functions and committees.
15.	Engage in continuous professional and skill development.

Person Specification

Educational and/or Professional Qualifications

(E=Essential, i.e. a candidate must meet all essential criteria to be considered for selection, D=Desirable)

E1 Good honours degree and holding a PhD, (or equivalent professional experience) in Electrical Engineering or other relevant discipline (especially if related to power system monitoring, protection and control, energy systems with multi-vector resources, etc.).

D1 Membership of relevant Chartered/professional bodies.

Experience

E2 Ability to conduct individual research work with a track record of publications in leading journals and conferences.

E3 Significant experience with power system monitoring, protection and control, ideally with experience in energy systems with multi-vector resources.

E4 Extensive experience and excellent skills in modelling of electrical or more broadly energy systems, and specialised in power system simulation software, preferably Matlab/Simulink, PowerFactory/Digsilent, and RTDS

D2 Fluency in high level programming languages, such as Python, C++, Matlab, etc.

D3 Experience of student supervision and teaching activities.

D4 Experience in writing research proposals and securing research funding

D5 Experience with work on research projects and knowledge exchange related activities.

Job Related Skills and Achievements

E5 Ability to work well within a team environment.

E6 Possess strong analytical and problem-solving abilities.

Personal Attributes

E7 Excellent interpersonal and communication skills, with the ability to listen, engage and persuade, and to present complex information in an accessible way to a range of audiences.

E8 The ability to work independently and conduct experiments, with minimum supervision

E9 Self-starter and able to work to deadlines

Application Procedure

Applicants are required to complete an application form including the name of three referees who will be contacted before interview without further permission, unless you indicate that you would prefer otherwise. Applicants should also submit a Curriculum Vitae and a covering letter detailing the knowledge, skills and experience you think make you the right candidate for the job. Applicants should also complete the Equal Opportunities Monitoring Form.

Other Information

Further information on the application process and working at Strathclyde can be found on our website

(<http://www.strath.ac.uk/hr/workforus>).

Informal enquiries about the post can be directed to Dr Qiteng Hong, Lecturer and Strathclyde's Chancellor's Fellow (q.hong@strath.ac.uk).

Conditions of Employment

Conditions of employment relating to the Research staff category can be found at: [Conditions of Employment](#).

Rewards and Benefits

Our staff have access to a wide range of outstanding benefits that include financial rewards, family friendly and wellbeing benefits and career development opportunities, details of which can be found [here](#).

Probation

Where applicable, the successful applicant will be required to serve a 9 month probationary period.

Pension

The successful applicant will be eligible to join the Universities' Superannuation Scheme. Further information regarding this scheme is available from [Payroll and Pensions](#).

Interviews

Formal interviews for this post will be advised in due course.

Equality and Diversity

We value diversity and welcome applications from all sections of the community.

The University currently holds a Bronze Athena SWAN award, recognising our commitment to advancing women's careers in science, technology, engineering, maths and medicine (STEMM) employment in academia.

University Values

The University's Values capture what we're all about: who we are, what we believe in and what we stand for. [Our Values](#) have been derived from how we act and how we expect to be treated as part of Strathclyde.

