UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Integrated Simulation of Power, EVs and Charging Infrastructure, Faculty of Environment

Salary: Grade 7 (£41,064 – £48,822 p.a. depending on experience)

Reporting to: Professor Haibo Chen

Reference: ENVTR1219

Fixed term until 30 June 2028 to complete a specific task or time limited work

Location: University of Leeds (with scope for hybrid working)

We are open to discussing flexible working arrangements

Research Fellow in Integrated Simulation of Power, EVs and Charging Infrastructure, Faculty of Environment

Overview of the role

Are you an experienced and ambitious researcher looking for your next challenge? Are interested in pushing forward the state-of-the-art in innovative bi-directional charging and smart Grid-level energy optimisation, in the context of e-mobility and sustainable transport systems? Do you want to further your career in one of the world leading research institutions in Transport?

Based in the Institute for Transport Studies at the University of Leeds, you will primarily contribute to the modelling and simulation of the integrated optimisation of Vehicle-to-Grid (V2G) energy flows, using data on e-mobility demand, traffic and parking patterns, and grid configuration. This work will contribute to the development of statistical models to predict and support power supply planning.

You are expected to mainly work on the EU-funded project "ePowerMove: Enabling large e-fleets participation in power systems optimisation through mass deployment of people-friendly, low-cost infrastructure and interoperable vehicles" (see the project's website for details). Your research will provide input to the assessment of policy intervention scenarios and strategies for short- and long-term green vehicle uptake in various markets, accelerating the transition to sustainable urban mobility and contribute to the reduction of greenhouse gas emissions in the transport sector. You may also be requested to support relevant research activities in other on-going projects such as ZEV-UP which aims to develop and demonstrate frugal electric vehicles and their innovative solutions for urban transport demand.

Main duties and responsibilities

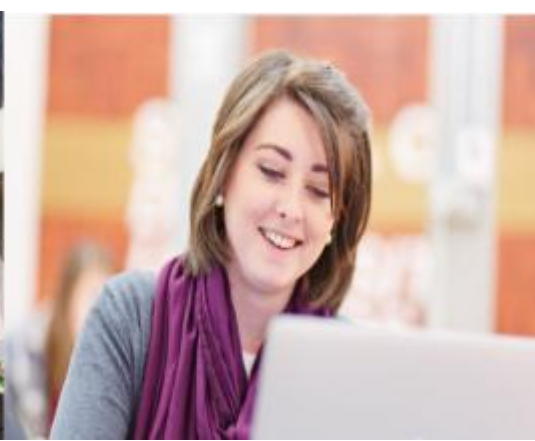
- Creating a multi-level architecture that integrates a synergetic framework to manage charging infrastructure, RES and the distribution grid;
- Modelling, managing and forecasting charging point demand and operation to enhance overall grid management;



- Developing solutions for grid operators to manage charging and alleviate congestion;
- Devising solutions for prosumers and EV charging to handle bidirectional charging and local resources, reducing electricity costs and improving RES utilization with grid-supporting functions;
- Creating digital twin tools to investigate EV charging's grid impact, identify congestion proactively, and assess solution effectiveness;
- Developing digital twin power management models to extensively test ePowerMove solutions' effectiveness across various system configurations and assess their large-scale grid impact;
- Incorporating statistical models of parking demand, traffic conditions, grid configuration, and energy flows to aid power supply planning on regional or national scales;
- Integrating with real traffic and behavioural data to ensure these models are validated, calibrated, and demonstrated in real-time;
- Generating and pursuing independent and original research ideas in the appropriate subject area;
- Developing research objectives and proposals and contributing to setting the direction of the research project and team including preparing proposals for funding in collaboration with colleagues;
- Evaluating methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own work;
- Preparing papers for publication in leading international journals and disseminating research results through other recognised forms of output;
- Working both independently and also as part of a larger team of researchers, engaging in knowledge-transfer activities where appropriate and feasible;
- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues as appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including assisting with the supervision of projects in areas relevant to the project.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.





Qualifications and skills

Essential

- A PhD or near completion - i.e. the initial thesis needs to have been handed in at the point of application in Engineering (preferably in sub-subjects such as Power systems, Electrical Automation, Control Science and Engineering), or a closely allied discipline;
- A strong modelling background in the assessment of the Grid's energy system planning and optimization, load demand response;
- Experience in collaborative planning of active power distribution systems and charging infrastructure including large-scale electric vehicles;
- Good time management and planning skills, with the ability to meet tight deadlines, manage competing demands and work effectively under pressure without close support;
- A developing track record of peer reviewed publications in international journals;
- Excellent written and verbal communication skills including presentation skills;
- A proven ability to work well both individually and in a team;
- A strong commitment to your own continuous professional development.

Desirable

- Peer-reviewed publications in journals such as Transportation Research Series, IEEE Transactions Series (in particular Smart Grid, Sustainable Energy), Applied Energy, Transport Policy, and/or charging-related journals;
- Good knowledge of bi-directional charging technology, such as the basic structure of the distribution grid, the discharge path in AC-based and DC-based V2G solutions;
- Good knowledge of the design and operations of V2G-enabled electric vehicles, including experience with EV-to-grid data fusion or V2G potential assessments;
- A good understanding of modelling the effects of traffic characteristics on energy consumption and vehicle emissions.

Additional information

Please note: If you are not a British or Irish citizen, from 1 January 2021 you will require permission to work in the UK. This will normally be in the form of a visa but, if you are



an EEA/Swiss citizen and resident in the UK before 31 December 2020, this may be your passport or status under the EU Settlement Scheme.

Please note that this post may be suitable for sponsorship under the Skilled Worker visa route but first-time applicants might need to qualify for salary concessions. For more information please visit: www.gov.uk/skilled-worker-visa.

For research and academic posts, we will consider eligibility under the Global Talent visa. For more information please visit: https://www.gov.uk/global-talent.

Find out more about the Faculty of Environment

Find out more about the Institute for Transport Studies

Find out more about our Research and associated facilities

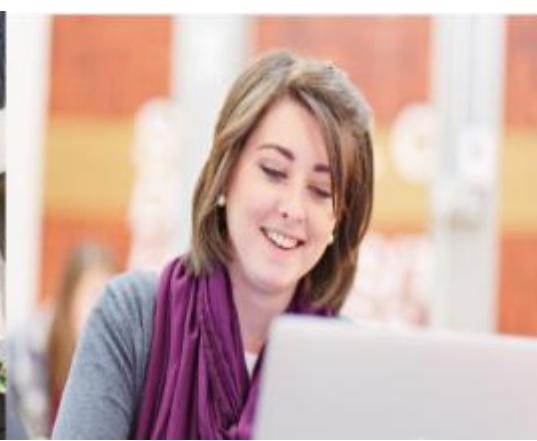
Find out more about Equality in the Faculty

Our University
As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Environment we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian, people who belong to a minority ethnic community; people who identify as LGBT+; and disabled people. Candidates will always be selected based on merit and ability.

The Faculty of Environment has received a prestigious Athena SWAN silver award from Advance HE, the national body that promotes equality in the higher education sector. This award represents the combined efforts of all schools in the Faculty and shows the positive actions we have taken to ensure that our policies, processes and ethos all promote an equal and inclusive environment for work and study.

Working at Leeds
We are a campus based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out





more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our Working at Leeds information page.

Candidates with disabilities
Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our Accessibility information page or by getting in touch with us at disclosure@leeds.ac.uk.

Criminal Record Information

Rehabilitation of Offenders Act 1974
A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information page.