School of Mechanical, Electrical, and Manufacturing Engineering

Research Associate in Fluid Dynamics

Job Ref: REQ260410

School/Department summary:

The Loughborough University and Caterpillar Innovation & Research Centre (I&RC) is a long-standing strategic partnership between one of the UK's leading engineering universities and a global leader in off-highway power systems. Based within Loughborough University's Schools of Engineering, the Centre brings together world-class academic expertise and industrial insight to develop the next generation of sustainable powertrain technologies. The I&RC focuses on the discovery, understanding, and application of advanced engineering solutions that deliver both scientific innovation and tangible business impact. Research spans engine and powertrain systems, materials, design methodologies, electrification, sensing, and control technologies.

Project Description:
Funded by the Advanced Propulsion Centre, the postholder will undertake experimental research within the Caterpillar Innovation & Research Centre (I&RC) at Loughborough University, contributing to the development of next-generation low-carbon powertrain technologies. The successful candidate will apply advanced experimental methods and optical diagnostic techniques to investigate the fluid dynamic processes that underpin hydrogen engine performance and emissions aftertreatment effectiveness. Working closely with academic and industrial partners, they will generate new scientific understanding, develop experimental methodologies, analyse complex datasets, and communicate findings through high-quality publications and technical reports.

Job Description

Job Family and Grade: Specialist and Supporting Academic Research Grade 6

Job Purpose
The purpose of this role is to advance understanding of the fluid dynamic processes that influence combustion and emissions control in future low-carbon power systems. Working within a multidisciplinary team, the postholder will provide experimental data and scientific insight to support design optimisation and model development for advanced engine and aftertreatment technologies. The research will contribute directly to the development of sustainable off-highway power generation solutions.

Job Duties

- To be responsible for investigating key thermofluid interactions with power system units.
- To engage with literature to provide suitable reviews and relevant opportunities.
- To develop appropriate experimental investigations to understand specific fundamental interactions and trade-offs.
- To conduct thorough and meaningful experimental measurements
- Analyse data appropriately to provide insight and understanding of the interactions.
- To formulate detailed plans for the project based on broad targets from the project team.
- To feed back to the project team on progress, to make recommendations for next steps.
- Write up regular progress reports and present outcomes to all Investigators and Collaborators.
- Travel to attend meetings and make presentations both within the project partners working group and to external stakeholders.
- To write research papers suitable for publication in high quality academic journals.
- To attend and contribute to conferences.
- Contribute ideas for new research and enterprise directions.

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- Maintain confidentiality at all times and ensure that intellectual property (IP) agreements are not violated.
- Engage in training programmes in the University (or elsewhere) that are consistent with the needs and aspirations of the project and those of the Department.
- Undertake other duties as may be reasonably requested and that are commensurate with the nature and grade of the post.]

Points To Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility outlined in the document.

Organisational Responsibility

Reports to the: Principle Investigator of the Project: Dr. Edward Long

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Person Specification

Your application will be assessed based on the essential and desirable criteria listed below.

Applicants are strongly encouraged to explicitly demonstrate how they meet each essential (and desirable) criteria at the application stage. The criteria that you need to demonstrate in your application will be listed as Stage 1 in the table below.

Stages of assessment are as follows:

1 – Criteria measured at Application
2 – Criteria measured at Test/Assessment Centre/Presentation
3 - Criteria measured at Interview

Essential Criteria:

Area	Criteria	Stage
Experience	The conducting of substantial original research that can be, or has been published in high quality journals	1, 3
	Extensive experience of advanced measurement techniques	1,3
	Extensive project planning experience	1,3
	Extensive experience with the analysis of quantitative experimental data	1,3
	Experienced IT/ Internet user	1, 3
	Design and conduct experiments in a lab-based setting.	1, 3
	Significant experience in computer aided design techniques for mechanical systems	1,3
Skills and abilities	Demonstration of excellent technical ability	1, 3
	Proven experience with optical diagnostic techniques.	1, 3
	Excellent written and oral communication skills.	1, 3
	Self-motivated with ability to meet deadlines.	1, 3
	Excellent interpersonal, and organisational skills.	1, 3
	Working knowledge of word processing, presentation, and data analysis software packages.	1, 3
	Ability to write project reports and make technical presentations to industrial and academic research groups.	1, 3
	Knowledge of relevant Health & Safety issues.	1, 3
Training	Demonstrate evidence of having undertaken further training and a willingness to be trained if necessary to fulfil the requirements of the job.	1, 3
Qualifications	A doctorate (e.g. PhD or EngD), or nearing completion of a doctorate in a relevant subject or extensive equivalent experience in an intensive advanced research environment.	1
	2:1 Bachelors or Masters level degree in, Mechanical Engineering, or related disciple.	1
Other	Commitment to observing the University's Equal Opportunities policy at all times.	3

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Desirable Criteria:

Area	Criteria	Stage
Experience	Working with industry.	1, 3
	Significant experience with modelling techniques and experimental instrumentation	1, 3
	Extensive project planning experience	1,3
Skills and abilities	Authoring original work, in the highest quality refereed academic journals.	1
	Extensive knowledge of engine technology and systems	1, 3
	Strong track record in originating and developing new ideas	1
	Relevant industrial experience	1, 3
Other	Able to travel to industrial collaborators' sites	1, 3

Conditions of Service

The appointment will be subject to the University's Terms and Conditions of Employment relevant to the job grade.

Shared University Responsibilities

As a member of the Loughborough community, you are expected to:

- Take reasonable care of yourself, others and the environment, and to prevent harm by your acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Sustainability Policies & Procedures.
- Support and contribute to the University's commitment to Equity, Diversity, and Inclusion (EDI), while carrying out all duties in a way that respects these principles and upholds the right to free expression. Further information about EDI at Loughborough and our strategic aims is available on our website

Our Purpose, Vision, and Values

Our purpose, Vision and Values underpin all that we do and shape how we work together at Loughborough.

We're proud to promote our values: **Adventurous**, **Collaborative**, **Creative**, **Authentic** and **Responsible**. Our people bring these values to life every day, and they are central to the positive and supportive culture that makes Loughborough unique.

If you join us, you'll be encouraged to bring these values to life in your own work and contribute to the positive, supportive culture that makes Loughborough unique.

Read more about our **vision and values**.

Our Accreditations

Athena SWAN Bronze Award

We strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career.

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We are proud to be a Race Equality Charter Member. The Charter aims to improve the representation, progression and success of all minority ethnic staff and students within higher education and address issues of racism within higher education institutions (HEIs).

We are proud to be a Disability Confident Employer and have adopted a proactive approach to employing disabled people and to creating a more diverse workforce. We ensure that our recruitment processes are inclusive and accessible. We guarantee to offer an interview to all applicants who have declared themselves with a disability, provided they meet the essential criteria for a role. We proactively anticipate and provide reasonable adjustments and support existing employees who acquire a disability or long-term condition to thrive in the workplace.

We are a real living wage employer, and our Living Wage Employer Mark shows our commitment to paying our staff according to the cost of living.

We are proud supporters of the City of Sanctuary movement and delighted to be recognised as a University of Sanctuary. This national network brings together, university staff, lecturers, academics and students, who together work to make Higher Education institutions place of safety, solidarity and empowerment for people seeking sanctuary.

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

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