Wolfson School of Mechanical, Electrical and Manufacturing Engineering

Loughborough University

Research Associate in Thermofluids and Optical Diagnostics

Job Ref: REQ250707

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

The Loughborough University and Caterpillar Innovation and Research Centre (I&RC) is a collaboration between academia and industry. The core aim of the Centre, based in Loughborough's Schools of Engineering, is the discovery and development of new engineering processes and components based on scientific advances that give a compelling business benefit. The Loughborough academic team works in the fundamental aspects of engine and powertrain system technology, the application of new design methods and materials and brings advances in electronics and control methods.

Project Description

An innovative researcher is required to work on an existing research project within the I&RC, focused on hydrogen engine development. The project will be investigating fundamental thermofluid processes, utilising advanced experimental techniques such Particle Image Velocimetry, to provide new insight and understanding. The role available will focus on in-cylinder flow processes and mixing, however there will be opportunities to engage with the wider engineering challenges and other sections of work within the project. The work will be feeding directly into the development of next-generation hydrogen fuelled hybrid power units. The researchers will be joining a multi-disciplinary team working on a range of projects within the I&RC, collaborating closely with industrial partners. We are looking for researchers with a strong experimental background, familiar with optical diagnostic techniques, and experienced in analysing fluid processes. We will provide both training and mentoring opportunities to enable everyone in the team to unlock their maximum potential.

Job Description

Job Grade: Specialist and Supporting Academic Grade 6

Job Purpose

To conduct research into thermofluid interactions. The focus will be on experimental investigation into fundamental physical processes; developing understanding of the driving mechanics, and use this insight to support improved design and operation. In particular, the Postdoctoral Research Associate (PDRA) will be expected to design and develop appropriate experimental setups, conduct appropriate and controlled measurements using state-of-the-art optical techniques, develop theoretical understanding of the processes under investigation, and help inform design processes.

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.
- Be responsible for conducting the day to day running of specific project work-packages.
- 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.
- Maintain confidentiality at all times and ensure that intellectual property (IP) agreements are not violated.
- To assist the academic staff in the project team with the supervision of undergraduate, MSc, and PhD project work and day-today supervision and support of other researchers.
- Where appropriate, to deliver teaching, tutorial, and laboratory sessions to students.
  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 entailed.

Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equity & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equity & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Belonging and Inclusion and, where appropriate, Recruitment and Selection.

Organisational Responsibility

Reports to Dr. Edward Long - project principal investigator

Person Specification

Your application will be reviewed with respect to meeting the essential and desirable criteria listed below. Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

1 – Application
2 – Test/Assessment Centre/Presentation
3 – 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 (PhD), or nearing completion of a doctorate in a relevant subject or extensive equivalent experience in an intensive advanced research environment.	1
Other	Commitment to observing the University's Equal Opportunities policy at all times.	3

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 position is full-time and fixed term for 18 months. Salary will be on Specialist and Supporting Academic Grade 6, £35,116 to £36,130 per annum, at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's Terms and Conditions of Employment for staff grades 6 and above, details of which can be found here.

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which can be found here.

The University offers a wide range of employee benefits which can be found here.

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html

In addition, the University is supportive, wherever possible, of flexible working arrangements.
We also strive to create a culture that supports Equity 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. For further information on Athena SWAN see http://www.lboro.ac.uk/services/hr/athena-swan/