School of Aeronautical, Automotive, Chemical and Materials Engineering

Senior Research Associate in Multi-Phase Wind Tunnel Development

Ref:REQ250020

Please note that, as part of the University's ongoing commitment to redeployment, this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Project Description

Job Grade: Specialist and Supporting Academic Grade 7

Introduction

Loughborough University has recently been awarded more than £1M to develop a novel multi-phase wind tunnel. This is part of a UKRI/EPSRC award to the National Wind Tunnel Facility (NWTF https://www.nwtf.ac.uk) and is a unique opportunity to design, implement and gather measurements for a new wind tunnel.

The multi-phase wind tunnel facility will allow the investigation and measurement of applications involving a significant amount of a dispersed phase in an airflow. While the facility is intended for use with a range of applications, the initial goal is to replicate and measure the spray from a car wheel operating on a wet road – this can then be used to understand how the spray affects the accuracy and reliability of automotive Advanced Driver Assistance Systems (ADAS) in wet environments. The post will involve elements of fundamental research using simulation tools to optimise the design and undertaking high quality measurements of the wheel spray, combined with strong mechanical design and project management skills. The succesful candidate will work closely with a Doctoral Researcher undertaking a PhD in automotive wheel sprays.

Job Purpose

To lead on the development and delivery of a multi-phase wind tunnel for the EPSRC National Wind Tunnel Facility. The project team will include academic staff and researchers, but this post will play a key leadership role and will be dedicated to delivery of this project.

Job Duties

- Working with other stakeholders, establish the academic and industrial requirements for the project and ensure that the facility delivers them.
- Lead on the conceptual design of the multi-phase wind tunnel leading to a down select of the design.
- Lead on the designs of the facility sub-systems (e.g. rolling road, wheel mounting, water injection and recovery, fan system, flow path).
- Devise experimental methods, using simulation software (for example CFD) and other methods to test and refine the design and application of the facility. This will be in collaboration with the project team, but driven by the post holder.

- Undertake measurements of wheel spray and disseminate findings in journal form and as a dataset.
- Identify suitable suppliers and liaise with Loughborough University procurement to ensure timely and cost-efficient procurement and installation of components.
- Establish work packages with technical staff and oversee in-house fabrication of components.
- Work in partnership with Facilities Management staff to create a suitable infrastructure. This includes establishing technical specifications and solving related problems with Loughborough colleagues and external contractors.
- In conjunction with Facilities Management, project manage the activity leading to a timely commissioning.
- Proactively identify opportunities to promote the facility and its capabilities at conferences, workshops and other opportunities.
- Collaborate and work with other staff within the department and across the National Wind Tunnel Facility network.
- Write reports, conference and journal papers on the outcomes and make presentations on the work to relevant industrial research groups and at appropriate seminars/workshops/conferences.
- Engage in training programmes in the University (e.g. through Staff Development) and elsewhere as required.
- Undertake such 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 have a duty and commitment to observing the University's Equality, Diversity and Inclusion policy and procedures at all times. Duties must be carried out in accordance with relevant Equality, Diversity and Inclusion legislation and University policies/procedures.

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

There will be a requirement to undertake further training relevant to the role, both in laboratory techniques and specific Health and Safety related areas.

The post holder may be required to work outside of normal office hours if necessitated by the exigencies of the service.

Organisational Responsibility

Reports to: Principal Investigator

Person Specification

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: Presentation; 3: Interview.

Essential Criteria

Area	Criteria	Stage
Experience	Significant experience in an Academic or Industrial research and development environment.	1,3
	Significant experience of experimental fluid mechanics, such as rig design, undertaking measurements etc.	1,3
Skills and abilities	Ability to lead teams to collectively solve and innovate around complex and strategic problems. Ability to coordinate the work of others and lead a group to achieve project outcomes.	1,3
	Ability to work independently, apply your own initiative, be self-motivated and proactively seek opportunities for improvement.	1,3
	Ability to work efficiently and accurately, planning and prioritising own workload to deliver tasks within agreed timescales.	1,3
	Ability to write project reports and to make technical presentations to industrial and academic research groups.	1,2,3
	Ability to initiate concepts for mechanical design and generate the necessary drawings and instructions for their creation.	1,3
	High level of skills in CAD and other mechanical simulation tools.	1,3
	Extensive knowledge of relevant techniques and methodologies, such as Computational Fluid Dynamics and multiphase modelling, Particle Image Velocimetry, fan/propellor aerodynamics etc.	1,2,3
	Proven organisational and project management skills and ability to work flexibly and independently.	1,3
	Proven ability to use excellent communication and interpersonal skills and professionally challenge and influence others, including senior colleagues, external companies and contractors, technical support staff and doctoral researchers.	1,2,3
Training	A willingness and ability to undertake further training, as appropriate and to adopt new procedures as and when required.	1,3
	Demonstrate evidence of continuing professional development relevant to the role.	1,3
Qualifications	PhD or equivalent experience in experimental or computational fluid dynamics.	1,3
Other	Commitment to observing the University's Equality, Diversity & Inclusion policies.	1,3

	Commitment to always observing Health and Safety regulations.	1,3

Desirable Criteria

Area	Criteria	Stage
Skills and abilities	Familiarity with automotive aerodynamics.	1,2,3
Experience	Experience of the development of experimental facilities.	1,2,3
	Experience of using CFD.	1,2,3
	Experience of research and/or development applied to automotive aerodynamics.	1,2,3
	Experience of multi-phase CFD.	1,2,3
	Experience of multi-phase non-intrusive experimental measurements.	1,2,3
	Experience of mechanical and/or electrical design for experimental rigs.	1,2,3
	Extensive Post doctoral research experience in fluid dynamics.	1,3

Conditions of Service

The position is full time and fixed term for 36 months. There is a possibility of a further 12 month extension. Salary will be on a Specialist and Supporting Grade 7, (£46,735 - £55,755 per annum) at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff, 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 are available at http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure---page.html

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 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. For further information on Athena SWAN see http://www.lboro.ac.uk/services/hr/athena-swan/

Application

The closing date for receipt of applications is **18th February 2025**