

LECTURER IN INTELLIGENT MOBILITY / AUTONOMOUS VEHICLES

Job Ref: REQ180167

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Overview of the Department

The Department of Aeronautical and Automotive Engineering (AAE) is one of three departments making up the School of Aeronautical, Automotive Chemical and Materials Engineering. The Department has a well-established reputation for its research and degree programmes. Undergraduate courses in Automobile and Aeronautical Engineering began in 1919 and 1935 respectively; today the Department enjoys a high status in the UK academic community with 33 full-time academic staff members. The Automotive Engineering programme remains specialist in nature and stands out in the UK academic community. Aeronautical Engineering is one of few in the UK and ranks highly amongst peers, and both Aeronautical and Automotive Engineering appear in the top 10 of undergraduate league tables. The University's performance in REF positions Loughborough as a leading research University, with the Times Higher ranking Loughborough 14th in the UK and 9th in England for research intensity. The department's annual research grants and contracts income is currently around £5 million per annum. This supports a research community of about forty post-doctoral research associates, seventy-five research students and a number of technical and administrative staff. In both research and teaching, the Department enjoys strong industrial links that support research sponsorship and collaboration, student placement and graduate employment. The department hosts the Rolls Royce University Technology Centre in Combustion System Aero Thermal Processes and the new £10 million National centre of excellence in gas turbine combustion systems and the Caterpillar Innovation and Research Centre.

Loughborough University Achievements. <http://www.lboro.ac.uk/about/achievements/>

Loughborough University Research. <http://www.lboro.ac.uk/research/#>

Aeronautical and Automotive Engineering. <http://www.lboro.ac.uk/departments/aae/>

Aeronautical and Automotive Engineering Research. <http://www.lboro.ac.uk/departments/aae/research/>

Aeronautical and Automotive Research facilities.

<http://www.lboro.ac.uk/departments/aae/research/majorlaboratoryfacilities/>

Current Research related to the post.

Our **autonomous vehicle** research focuses on the application of a broad range of autonomous control, signal processing and system techniques to aerospace and automotive applications with the aim of improving reliability, safety, efficiency and intelligence of modern transportation systems. The research activity includes:

- Situational awareness and decision making under uncertainty
- Driver modelling and characterisation and workload modelling
- Driver predictive modelling
- Collision avoidance and path planning
- Terminal Regional Operation of Unmanned Aircraft Systems
- Fault diagnosis and Platform health management
- Development of advanced verification and validation techniques for autonomous functions
- Remote sensing using autonomous platforms
- Development of algorithms for sensor fusion, autonomous control, guidance and planning

Control, Dynamics and reliability and risk analysis. Control applications includes, for example, engine and powertrain control, hybrid propulsion, diagnostic strategies for engines and vehicle dynamics applied to handling

and ride, driving assistance and motion cueing in simulator applications, advanced flight control, and control for vehicles with strong nonlinear dynamics. Reliability and risk analysis is applied to fault diagnostics, safety system optimisation, demand modelling, vehicle safety and new hazard analysis technologies and reliability modelling of phased missions.

Low carbon technology research includes: IC Engine research including combustion, HCCI, GDI, turbulent reacting flows, fuel sprays, analysis of In-cylinder flow structures and alternative fuels. Fuel cell technology, including cell modelling, hybrid fuel cell powertrain, fuel catalytic reforming. Our hybrid and electric vehicle research includes; real-world duty cycle for hybrid powertrain optimisation, fuel cell as range extender for electric vehicles, and interaction of components and control systems for electric and hybrid electric vehicles. In addition we have significant experience in the interaction of components and control systems for electric and hybrid-electric vehicles (HEVs).

Vehicle Aerodynamics research includes computational and experimental work in vehicle drag reduction, including fundamental studies of base pressure, complex bi-stable flows, passive and active flow control, Multiphase methods applied to surface contamination and exterior water management, crosswind stability and real world aerodynamics.

The post

The Department has identified intelligent mobility, Advanced Driver Assistance Systems (ADAS) and autonomy as an important area for growth and this post forms part of the department's long term investment to expand its capability and to strengthen Loughborough's growing reputation in this area. We are interested in candidates that can demonstrate that their research activity complements one or more of our current major research strengths and can also show that they can grow our activity in ground vehicle (Automotive) intelligence and autonomy. We are therefore interested in candidates from a range of backgrounds including, for example, autonomous vehicles, autonomous functions and ADAS, the application of information and computer technology to vehicles, artificial intelligence, machine learning, robotics, computer vision and image processing, driver and intelligent vehicle interaction, advanced verification and validation techniques, and electric and hybrid integration in intelligent powertrains. It is essential that candidates complement our existing research capabilities and have the vision to expand our research into the growing areas of intelligent and smart vehicles and systems.

Job Description

Please note that this is a generic job description for the position of Lecturer.

Job Grade

Research, Teaching and Enterprise Grade 7

Job Purpose

To take a leading role in developing and enhancing the research, teaching and enterprise activities of the School of Aeronautical, Automotive, Chemical and Materials Engineering in the area of the development of autonomous vehicles and/or unmanned vehicle technologies and their applications.

Job Duties

Research

- To pursue a personal research programme consistent with the research priorities of the School of Aeronautical, Automotive, Chemical and Materials Engineering that increases the global visibility and reputation of the University.
- To secure external research funding.
- To supervise and manage research projects.
- To publish the outcomes of research in outlets of international standing.
- To attend and contribute to major international conferences.
- To supervise postgraduate students at Masters and Doctoral levels.
- To collaborate in research initiatives with colleagues both within the University and externally.

Teaching

- To work with colleagues in the School to deliver an exceptional learning environment for students.
- To teach and inspire undergraduate and postgraduate students, and to conduct associated assessments.
- To provide academic and pastoral support to undergraduate and postgraduate students.
- To promote the use of a range of methods and techniques in teaching, learning and assessment.
- To engage in the evaluation and development of modules for which you have responsibility, in terms of content, delivery and assessment.
- To be responsible for the design and content of specific areas of teaching and learning within the School's undergraduate and postgraduate programmes.
- To cooperate with colleagues in the continuous review and development of the School's taught programmes and curriculum.

Enterprise

- To engage with business, public and voluntary organisations through knowledge exchange activities such as student projects and placements, research collaboration, consultancy and specialist training.
- To create social, cultural and economic impact from academic, especially research, activity.
- To secure external funding in support of these activities.
- To seek opportunities for the commercialisation of research and the formation of social enterprises.

Related Activities and Functions

- To work effectively with relevant administrative, technical and academic staff in the School and across the University.
- To carry out specific administrative roles and functions as may be reasonably required.
- To take part in and, on occasion, act as chair of one or more School committees.
- To engage in training programmes in the University (e.g. through Staff Development) which are consistent with your needs and aspirations and those of the School.
- To undertake such other duties as may be reasonably requested and that are commensurate with the nature and grade of the post.
- To engage fully with the annual Performance and Development Review (PDR) process.

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 Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

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

Organisational Responsibility

Reports to the Head of Department in Aeronautical and Automotive Engineering.

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	Background in an engineering or computer subject with specific and current expertise relevant to intelligent mobility/autonomy/autonomous vehicle technologies for ground vehicles.	1,2
	Currently and demonstrably active in research in one or more areas (e.g. computer vision, machine learning, robotics, or artificial intelligence) applicable to intelligent mobility, autonomous and unmanned ground vehicles	1,2
	Experience of working in an internationally recognised academic research environment, including significant experience at post-doctoral (or equivalent) level.	1
	Experience of authoring a substantial body of original work, in the highest quality refereed academic journals and / or as influential company reports.	1
	Significant experience of successfully supervising the projects of taught and research students or company staff at equivalent levels	1,3
Skills and abilities	Demonstrated ability to develop an original research programme on your own initiative and to persuade others of its importance orally and on paper	2,3
	Demonstrated ability to secure research and/or enterprise funds from external / company sources.	1,3
	Demonstrated ability to create social / cultural / economic impacts from professional activity	2,3
	Ability to teach and supervise undergraduate and postgraduate students in Autonomous Vehicles and related areas.	1,2
	Excellent communication and interpersonal skills which give you the ability to engage with students, colleagues, business and other agencies on a wide variety of matters.	1,2,3
	Ability to work as part of and to lead a team.	2,3
	Excellent IT skills.	1
Training	Commitment to and evidence of continuing professional development.	1,3
Qualifications	An outstanding educational profile up to and including first degree and/or Masters in relevant area	1
	Relevant Engineering or Computer PhD, or equivalent experience in research area relevant to intelligent mobility	1
Other	Commitment to observing the University's Equal Opportunities policy at all times.	1,3

Desirable Criteria

Area	Criteria	Stage
Experience	Currently and demonstrably active in research in one or more areas intelligent mobility, ADAS, development of autonomous and unmanned ground vehicles, and application of unmanned ground vehicle technologies.	1
	Experience of teaching and assessment at undergraduate and postgraduate level.	1,3
	Experience of successfully supervising the projects of taught and research students or company staff at equivalent levels.	1,3
	Experience of work in or in collaboration with Industry	1
	Experience in commercial exploitation of products / services or formation of social enterprises	1,3
Skills and abilities	Ability to take part in module and programme development.	3
	A sound understanding of the structure of universities and issues facing the UK higher education sector, for example: <ul style="list-style-type: none">• research funding opportunities in UK HE.• the challenges faced in recruiting students to UK HE	1,2,3
Qualifications	Achieved or progressing towards appropriate professional status.	1

Conditions of Service

The position is FULL TIME and OPEN-ENDED. Salary will be on Research, Teaching and Enterprise Grade 7, (£39,992 - £47,722) per annum, at a starting salary to be confirmed on offer of appointment. Subject to annual pay award.

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/>

Informal Enquiries

Informal enquiries are welcomed and should be made to Professor Martin Passmore, Head of Department, Aeronautical and Automotive Engineering by email at m.a.passmore@lboro.ac.uk or by telephone on +44(0)1509 227250

Applications

The closing date for receipt of applications is **20 April 2018**.