

ABOUT LOUGHBOROUGH UNIVERSITY

**WOLFSON SCHOOL OF MECHANICAL, MANUFACTURING AND ELECTRICAL
ENGINEERING**

RESEARCH ASSOCIATE IN MULTIFUNCTIONAL MATERIALS

MANUFACTURING FOR THE AUTOMOTIVE INDUSTRY

(Fixed term, 15 months)

REQ16018

January 2016

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Reaching the target the UK has committed to for CO₂ emission levels by 2025 will require a decarbonisation of transport. Current reductions have been gained by improvements in engine performance but these gains will no longer be sufficient. To meet the target we need to reduce vehicle mass. The car industry needs to find a way to manufacture lightweight structures without incurring additional production costs.

Loughborough University and FAR UK Ltd, a Nottingham-based innovative low-volume tailored vehicle designer and manufacturer, have joined forces to explore the concept of novel and engineered structures, multifunctional materials bespoke for their mechanical properties, and manufactured in a cost-benefit and continuous fashion using Sonication technology that allows on-demand tailoring of porosity.

We are looking for a graduate in Mechanical Engineering, Electrical Engineering, or Mechatronics who is capable of performing requirements capture of a component, of designing & testing engineered structures via FEA simulations (composites), who can set up experimental rigs (design and commissioning of hardware) in the lab and instrument those rigs (ie. signal acquisition and signal processing tests using software such as LabView or similar). The research associate will also be expected to conduct mechanical testing of composites, hence experience with testing machines (eg. Instron) and materials characterisation methods are desirable.

The research associate is required to support the building of a small scale set-up to undertake those tests, therefore some previous knowledge of computer-assisted design packages will be favourable.

The candidate will have to be capable of conducting research in a scholarly fashion, plan and run experimental work, interpret the results and generate original problem-solving strategies in an applications engineering scenario.

The post holder will be based at Loughborough University, Wolfson School and will be supported by the expertise and facilities at FAR-UK Ltd.

We are passionate about developing our researchers into highly skilled professionals in the field of High Value Manufacturing, so the post holder will benefit from a range of opportunities designed to progress his/her professional development and coach this progression.

We have a commitment to gender equality and support the Athena SWAN charter. We encourage women to apply for this position as they are under-represented. All appointments will be made on merit.

JOB DESCRIPTION

Job Grade: Research Grade 6

Job Purpose:

To develop a manufacturing protocol for multifunctional lightweight materials that exhibit bespoke mechanical properties, using sonication technology, and in collaboration with FAR-UK Ltd, our industry partners.

Duties and Responsibilities:

Research and Technical

- To prepare a design specification including technical and environmental considerations, along with a requirements capture of engineered structures to be used in the vehicle environment
- To interpret the requirements of the automotive industry in terms of mechanical properties using software such as Finite Element Analysis packages.
- To explore relevant manufacturing techniques using sonication as a porosity engineering agent – this includes generation and measurement of acoustic fields
- To conceive, design and engineer the necessary hardware and instrumentation in conjunction with the project technical staff
- To conduct technical research on materials, composites, components and other parts as necessary – this includes mechanical testing as well as materials characterisation
- To acquire, gather, analyse and interpret results of their own research and generate implementation ideas for the subsequent stages of the project
- To maintain written records of research results to a scientific standard suitable for publication

General, Professional Development:

- To plan and conduct own day-to-day research activities within the framework of the project
- To manage the reporting elements of the relevant work content of the project

- To work effectively with relevant administrative, technical and academic staff in the School, across the University, and at FAR-UK ltd
- To feed back to the project team on progress, to make recommendations for next steps and to prepare project reports
- To engage in training programmes in the University (e.g. through Staff Development) which are consistent with own needs and aspirations and those of the project team and the host School
- To carry out specific other duties as may be reasonably requested by the project leader and that are commensurate with the nature and grade of the post
- To pursue excellence and maintain high standards of outputs and interpersonal relationships

Other:

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.

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, where operational needs allow, of flexible working arrangements.

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

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PERSON SPECIFICATION

Job Title: Research Associate

Job Grade: Research Grade 6

Attributes	Essential	Desirable
Education & Qualifications	Mechanical Engineering or Electrical/Electronics Engineering degree (1)	Some specialism in Mechatronics (1) PhD in Engineering or Physics or equivalent research experience (1)
Experience	Experience within an experimental environment or conducted research applied to industry (1,3) Experience in mechanical testing procedures (1, 3) Experience in materials characterization (eg SEM) (1, 3) Experience of commissioning instruments, lab equipment and, if necessary, tailoring it to specific applications (1,3) Experience in setting-up experimental rigs in the benchtop scale (1, 3) Ability to conduct research by preparing experiments and interpreting results (3)	Modelling or simulations background, whether in CAD/FEA, multiphysics, process manufacturing, etc (1,3) Some experience in signal processing testing and analysis (1, 3) Background in structural mechanics (1) Post-graduate experience in an academic environment (1,3) Industrial experience (i.e. working in industry during studies or after graduation) (1,3) Experience of interdisciplinary research (3) Experience of any CAD software (1,3)
Skills & Abilities	Effective communicator with the ability to liaise with project team members (1,3) Independent researcher capable of working under minimum supervision if required (1, 3)	Capable of planning short and mid-term research activities within the framework of the project (3) Capable of leading a project and managing it throughout (1,3) Ability to synthesize industrial needs into research activities (1,3)

	A flair for learning new skills, becoming highly employable after the project and be guided towards further professional and personal development (3)	
Other Attributes	<p>Willingness to undertake training if needed for further professional development (3)</p> <p>Committed to observing the University's Equal Opportunities policy at all times (3)</p> <p>A good working knowledge of equal opportunities and understanding of diversity in the workplace (1, 3)</p>	

Stages in assessment: 1: Application form at shortlisting, 2: Selection test, 3: Interview.

Conditions of Service

The appointment will be on a fixed-term contract on Research Grade 6 (£28,982 – £31,656 per annum) at a starting salary commensurate with experience and qualifications. The contract can be offered part time, a 4-day per week for a duration of 15 months or full time post for a duration of 12 months.

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 at: <http://www.lboro.ac.uk/services/hr/a-z/conditions-of-service.html>

Informal Enquiries

Informal enquiries should be made to Dr Carmen Torres-Sánchez, by email c.torres@lboro.ac.uk or phone: +44 (0)1509 227 518

The closing date for receipt of applications is **15:00 hours on 19 February 2016**.

Applicants are advised to pencil in the interview date of 22 February 2016. Shortlisted candidates will be informed within 24 hours of closing date. Interviews of shortlisted candidates will be conducted preferably face to face. Teleconference tools may be used if the applicant is unable to travel to Loughborough on that date.

The successful applicant is invited to join the project as soon as possible after job offer.