

Research Associate – Automation for Resource Efficiency in the Food Industry

Job Ref: REQ180868

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Centre for Sustainable Manufacturing and Recycling Technologies (SMART)

The Centre for SMART was established in the Wolfson School of Mechanical, Electrical and Manufacturing Engineering at Loughborough University to provide synergy for the growing teaching and research activities in sustainable design and manufacture (www.lboro.ac.uk/smart). The remit of the Centre is to develop strategies, methodologies and supporting technologies for the design, production, consumption and disposal of products, that meet consumer needs as well as legislation, environmental and ethical standards, whilst safe-guarding the future prosperity of manufacturing businesses.

Since its establishment in 2004, the Centre has attracted more than £6.5 million of national and European research funds to support its activities, and this has supported the successful completion of 15 PhD programmes and the publication of 60 refereed journal papers. The Centre members have a wide range of expertise and are currently involved in a number of national and European programmes researching the social, economic and environmental aspects of a variety of consumer products and industrial processes. The Centre provides core knowledge and expertise in life cycle analysis, sustainable design, resource efficient manufacturing, sensing, monitoring and process control, sustainable business and consumption models, and end-of-life processing and recycling technologies.

Project Description

One of the most prominent challenges facing modern industry is 'how to produce more with fewer resources'. Nowhere is this more important than in food. In the UK Food and Drink is the largest manufacturing sector with a turnover of £76.2bn, employing up to 400,000 people, with annual exports worth £10.8bn. Globally, demographically-linked changes in demand and dietary behaviours, and loss of arable land linked to climate change, urgently demands a change in the way we grow, manufacture and consume our food products.

At the same time industry is undergoing a technological revolution created by the fusion of information technology, mobile devices, ubiquitous sensors and artificial intelligence. Various names given to this phenomenon are cyber-physical systems, internet of things (IOT), or the fourth industrial revolution. Business and governments are looking to this paradigm change to reduce costs, guarantee quality, shorten times to market and promote economic growth. Importantly, because the infrastructure is in the early stages of development, there is currently the potential to incorporate resource efficiency and circular economy thinking directly into the underpinning architecture of cyberphysical systems.

In pursuit of this goal the Centre for SMART is looking to build the results of four years of research into use of sensors for resource efficiency improvement in food manufacturing into laboratory-scale demonstrator systems, to be used to accelerate the impact of the research by presenting it in a readily accessible and credible form to industrial partners, as well as to support further development.

The aim of this five month project will therefore be to complete the automation and networking of demonstrator systems in control of water usage and reduction of food waste. The work will include integration of sensors and actuators with control intelligence, analysis software and dashboard displays via a local network. The final

implementations should be robust and easy to operate. The post holder will carry out experimentation using the developed systems and publish the results in high quality academic journals.

The project will give an opportunity for the post holder to build their knowledge base and demonstrate skills relevant to two fast moving and sought after competence areas; resource efficiency and cyberphysical systems.

The project is part of a national 'EPSRC Centre for Innovative Manufacturing in Food', which is a £5M multi-disciplinary research programme that commenced in October 2013. Nottingham, Birmingham and Loughborough Universities form the academic core of this national Centre, which also has the support of a number of large food manufacturing companies and retailers including AB Sugar, Cargill, Mars, McCain Foods, PepsiCo, Premier Foods, Nestle, Unilever, Marks and Spencer, and J Sainsbury.

The Research Associate in this project will work as part of a multidisciplinary team within the Centre for SMART, as well as with the other academic and industrial partners within the EPSRC Centre for Innovative Manufacturing in Food.

Job Description

Job Grade: Specialist and Supporting Academic Grade 6

Job Purpose

The post holder will hold a research position within the Centre for SMART and be responsible for carrying out the job duties described below:

Job Duties

- To review the relevant literature and the state-of-art practices
- To undertake the automation and networking of demonstrator systems in control of water usage and reduction of food waste
- To undertake experimental investigations using the developed systems
- To write high quality academic publications on the results of the work
- To travel, when required, to national, European and international partners, manufacturers and equipment suppliers.
- To provide support and supervision of research students and associates.
- To make presentations to industry and academia.
- To deputise for the project leader(s) when required.
- To work as part of a project and university team and to help maintain the associated facilities
- To work effectively with relevant administrative, technical and academic staff in the Department and across the University.
- To engage in training programmes at the University (e.g. through Staff Development) which are consistent with your needs and aspirations and those of the project team and the host department.
- To pursue excellence and maintain high standards of safety in all activities.
- To undertake other such 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 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 Professor of Sustainable Engineering.

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 – Test/Assessment Centre/Presentation
- 3 – Interview

Essential Criteria

Area	Criteria	Stage	
Experience	Current or recent relevant experience in an academic or industrial environment	1, 3	
	Practical experience of interfacing computers to external equipment and writing control software	1, 3	
	Relevant project management experience	1, 3	
Skills and abilities	Experience of authoring original work for academic journals with high citation factors, conference papers or technical reports for industry	1, 3	
	Ability to plan and execute an experimental programme	1,3	
	Excellent practical and problem solving skills	1,3	
	Excellent numerical data analysis skills	1,3	
	Excellent interpersonal and organisational skills	1,3	
	Ability to engage with industry on projects	1,3	
	Ability to work independently, plan own work and meet deadlines	1,3	
	Good IT and administrative skills	1	
	Excellent written and oral communication skills	1,3	
	Excellent knowledge of presentation and report writing software	1	
	Ability to support research students in relevant areas	1,3	
	Ability to contribute to defining research proposals and seeking industrial support	1,3	
	Training	A willingness to undertake further training as appropriate and to adopt new procedures as and when required	3
	Qualifications	A good honours degree in a technical discipline	1
		PhD (or close to completion) in a field relevant to sustainability, manufacturing or automation	1
Other	Commitment to observing the University's Equal Opportunities policy at all times	1	
	Willingness and ability to travel	3	
	Commitment to maintaining confidentiality at all times	3	

Desirable Criteria

Area	Criteria	Stage
Experience	Current or recent relevant work experience in an academic or industrial environment	1, 3
	Experience of working in, or collaborating with industry	1,3
	A track record in the exploitation of research results	1, 3
	Experience of reporting on technical projects in academic and industrial environments	1, 3

Skills and abilities	A working knowledge of relevant programming languages and packages	1, 3
	A working knowledge of industrial equipment automation	1,3
	A good understanding of sustainability issues in industry	1,3
Qualifications	Post-graduate qualification to doctorate level in a relevant subject area or significant relevant experience at a senior level	1
Other	Valid licence for driving in the UK	1

Conditions of Service

The position is full time and fixed term to 28 February 2019 in the first instance. Salary will be on Specialist and Supporting Academic Grade 6, (£30,395 - £39,609) per annum, at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's normal Conditions of Service for 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 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/>

Applications

The closing date for receipt of applications is 28 October 2018.