Wolfson School of Mechanical, Electrical and Manufacturing Engineering

Loughborough University

Research Associate
Optical Detection (UV Fluorescence) for Reusable Polymer Packaging
REQ210096

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.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 Wolfson School of Mechanical, Electrical and Manufacturing Engineering is one of the largest of its kind in the UK and has an international reputation for being at the forefront of technological innovation and for maintaining extensive links with industry. Research grants (predominantly from the UK Research Councils and the EU), as well as extensive industrial sponsorship, support a range of research posts and enable the purchase of state-of-the-art equipment.

Loughborough is a progressive and distinctive University with a proud tradition of being research-intensive. It has been shown through successive National Student Surveys, excellent league tables and seven Queen's Anniversary Prizes, to be one of the UK's leading Higher Education Institutions.

Project Description

The Perpetual Plastic for Food to Go Project [PPFTG] is a three-year innovative multi-disciplinary project funded by the Industrial Challenge Strategy Fund's Smart Sustainable Plastic Packaging Challenge.

Fresh and chilled foods such as sandwiches and prepared salads sold by food retailers for consumption out of the home, is a growing UK market driven by the rise in convenience lifestyles that generates significant single-use plastic waste. To address this problem, this project will develop, prototype, and evaluate a novel circular business model that combines smart-technology enabled products and services to reduce the environmental, societal, and economic impact of Food-to-go [FTG] packaging. Recognising that no one single approach will overcome the identified problems, PPFTG brings together academics with expertise in sustainable design, sustainable manufacturing, and polymer chemistry with project partners that represent the interests of all operators and stages within the FTG supply chain. Together, we are taking a combined approach of novel smart technologies and quality assurance methods, in-depth understanding and modelling of consumer behaviour, and comprehensive supply chain value assessment to propose a novel future FTG Circular Product-Service System [CPSS].

This particular 18-month post will focus on the development of a technology for quality assurance of reusable polymer packaging. Specifically, an ultraviolet fluorescence imaging technique will be investigated to determine its ability to detect residual food fouling on FTG packaging and hence provide assurance to manufacturers, retailers and consumers regarding the packaging's safety. This fluorescence sensing technique has already been used at Loughborough for the identification proteins within foodstuffs deposited in large industrial process vessels. The tasks will include specification of an appropriate camera system, image processing and statistical analysis. The researcher will also work closely with the rest of the project team to provide technical insight into the development of a circular business approach for FTG packaging.

We are looking for an ambitious postdoctoral Research Associate who would like to contribute to the development of a revolutionary approach to product packaging which has the potential to have significant commercial and environmental benefit for the food manufacturing industry. The successful candidate will be able to demonstrate previous experience of experimental design, have a practical knowledge of image processing and will have a desire to be part of an interdisciplinary team working towards a common goal.

Job Description

Job Grade: Specialist and Supporting Academic Grade 6

Job Purpose

The post holder will work within the Wolfson School and be responsible for the development of a system for sensing and assessing the presence of a range of foodstuffs excited by ultraviolet illumination. Various packaging forms and materials will be investigated to enable quality assessment to support industrial decision making. They will also contribute to the development of new research themes around the concept of closed-loop polymers and in the preparation of national and international research proposals.

Duties and Responsibilities:

Specific, technical

- To review the relevant literature and current commercial practices.
- To make a significant contribution to system design and selection of hardware for sensing fluorescence of proteins excited by ultraviolet light.
- To design and implement a coordinated and comprehensive experimental programme for the detection of food fouling under a range of conditions.
- To devise a suitable image processing approach to extract useable data from recorded images.
- To work to overcome apparent problems with the integration of the technology in a proposed industrial environment.
- To interpret the capabilities of the assessment method for the design of packaging forms and business models.

General

- Be responsible for conducting the day to day running of the project.
- To formulate detailed plans for the project based on broad guidance 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 support the project team by enhancing relationships with existing collaborators and by assisting the establishment of relationships with new collaborators.
- To write research papers suitable for publication in high quality academic journals.
- To attend and contribute to conferences.
- To contribute to project promotion and public engagement events.
- Contribute ideas for new research and enterprise directions.
- Maintain confidentiality at all times and ensure that intellectual property (IPR) 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.

Teaching

Teaching is not the primary purpose of this post and teaching load will be small relative to the typical load of a member of academic staff in the School, but the Research Associate may be expected to contribute to taught programmes and student projects at any level, if appropriate, and if requested to do so.

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 a Senior Lecturer in Sustainable Manufacturing.

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 work experience in an academic or industrial environment	1, 3
	Practical experience of image processing	1, 3
	Relevant experience of design and execution of experimental procedures	1, 3
	Experience of authoring original work for academic journals, conference papers or technical reports for industry	1, 3
	A track record in writing operational procedures for the use of technical equipment	1, 3
Skills and abilities	Knowledge of light sources, detection equipment and data processing	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 and academia on projects	1, 3
	Ability to work independently, plan own work and meet deadlines	1, 3
	Ability to write project reports and make technical presentations to industrial and academic research groups	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
Training	A willingness to undertake further training as appropriate and to adopt new procedures as and when required	3
Qualifications	PhD (or close to completion) in a relevant subject area or significant relevant experience at a senior level	1, 3
	A good honours degree in Manufacturing Engineering, Physics or a relevant discipline	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	Industrial or academic experience of food packaging or food manufacturing processes	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
	Experience of writing research funding proposals	1, 3
Skills and abilities	A good understanding of food production and cleaning processes	1, 3
	A working knowledge of programming languages/packages (e.g. MatLab)	1, 3
	A good understanding of sustainability issues in industry	1,3
Qualifications	A higher degree (or equivalent experience) in food sciences	1
Other	Licensed to drive in the UK	1

Conditions of Service

The position is **full-time** and **fixed-term** for 18 months. Salary will be on Specialist and Supporting Academic Research 6, (£30,942 to £38,017 per annum), at a starting salary commensurate with experience and qualifications and which will be confirmed on offer of employment.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Grade 6 and above 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 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 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/