Wolfson School of Mechanical, Electrical, and Manufacturing Engineering

Loughborough University

Research Assistant in Circular Economy of Medical Devices

Job Ref: REQ250072

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

There is a vacancy within the Centre for Sustainable Manufacturing and Recycling Technologies (SMART) at Loughborough University for a talented and enthusiastic new Research Assistant with strong interest in circular economy, healthcare sustainability, remanufacturing and recycling, and a background in product design, mechanical, manufacturing or material engineering.

Loughborough University is renowned for the relevance of its research. Research undertaken at Loughborough helps business and industry to compete more effectively, shape public policy and ultimately improve the quality of people's lives. Loughborough has a research community made up of more than 2,200 staff and students, and is well known for having a wide range of research partnerships with multi-national businesses and has long-standing collaborative links with many public and private sector organisations.

The Centre for SMART was first established within the Wolfson School of Mechanical, Electrical and Manufacturing Engineering in 2004. The Centre's mission is to develop the new strategies, methodologies and supportive technologies required to implement a sustainable approach to the design, production, consumption and disposal of manufactured products thereby helping to safeguard the future of the planet. As one of the largest engineering schools in the UK, the Wolfson School is a leader in technological research and innovation, with extensive national and international connections to industry and has benefited from a recent £70 million investment into the west side of campus.

The Centre has core expertise and knowledge in life cycle analysis, sustainable design, resource and energy efficient manufacturing, end of life processing of products, and sustainable consumption and business models that are key enablers for achieving transformational change. Our industrially focused research enables us to work with some of the world's most renowned engineering and commercial companies.

Project Description

The quantity of small medical devices (SMD) in waste streams has escalated in recent years, due to a proliferation of medical treatments in both range and number, their inherent reliance on the use of medical devices and rapid growth in the number of patients seeking the most advanced treatments globally. This project aims to take a Circular Economy (CE) approach to reducing SMD waste. The CE is a term applied over the last decade to a system in which material resources and value are retained to perform useful functions, rather than being lost in landfill or converted to energy. The CE approach reduces environmental impacts from extraction and transport of virgin materials, benefiting society, and reduces the product lifecycle costs of access to the functions of a product, benefiting end-users and the productivity of economies.

This Engineering Physical Science Research Council (EPSRC) funded research is a collaborative project involving the Centre for SMART, the Surgical Technologies Research Group and Division of Health Economics at University of Leeds, Schools of Business and Design in Nottingham Trent University, two NHS Trusts and several other industrial partners. The project aims to create novel design and material specifications, reprocessing technologies as well as digital tools to demonstrate the technical, economic and operational viability of the circular economy for small medical devices. The research will utilise four carefully selected case study product families representing complexity versus value recovery to demonstrate the possibilities for reuse, remanufacture and/or recycling of medical product/device. These case studies are intended to serve as reference models for many other product families within the same respective categories and utilised to generate new knowledge that can be applied across and within multiple value chains.

The major research challenges are: user centred product design to separation of different contaminated components, tools to promote sustainable design and materials recovery in closed or open loops, bespoke reconfigurable recycling and remanufacturing technologies, waste sorting and material recycling, and the development of business models to support the circular economy and promote behavioural changes.

The project is led by Prof Shahin Rahimifard.

Job Description

Job Grade: Specialist and Supporting Academic Grade 5

Job Purpose:

The Postdoctoral Research Assistant will work as part of the wider research programme to develop a whole system circular approach to design, use and end-of-life management of small medical devices (SMD). This includes life cycle sustainability assessment (including environmental, economic and social considerations) to support 'design for circular economy' improvements as well as for the selection of the most appropriate reprocessing options (remanufacturing and reuse or material recycling) for various SMD categories.

Job Duties

Research

- To assist with conducting life cycle analysis research for a range of 'simple vs complex' and 'low value vs high value' small medical devices commonly used in both clinical (e.g. hospitals, GP surgeries) and home (e.g. patient home, care homes) settings.
- To support a programme of physical disassembly experimentations to identify possible automation solutions for end-of-life management of SMD.
- To support a programme of experiments on assessing the impact of decontamination and sterilisation processes on various materials included in SMD.
- To assist with developing a decision support model based on life cycle sustainability assessment to identify most appropriate reprocessing options (reuse, remanufacture or material recycling) for a SMD.
- To support with design and implementation of bespoke material recycling processes tailored to specific requirements of materials included in various SMD.
- To assist with developing guidelines for a 'design for circular economy' approach to improve the remanufacturing, reuse and/or material recycling of SMD.
- To collate, analyse, synthesise, interpret and present research data related to various experimentation programmes.
- To liaise with academic and industrial project partners, and with supervision to coordinate activities across the consortium.

General, technical

- To perform risk assessments, develop method statements and implement safe working practices.
- To manage technical equipment and provide training to other users as required.
- To actively engage with industrial and other non-academic stakeholders to determine system requirements and identify and address potential barriers for implementation.
- To regularly report research progress to the programme management group through formal and informal reports and communications.
- With supervision, to write research papers suitable for publication in high quality academic journals and for presentation at specialist scientific conferences.
- To attend and contribute to project meetings and engagement events.
- To assist in the development of research proposals and grant applications for follow-on project funding.
- To undertake general lab organisation and coordination tasks

General and administrative

- To work effectively with relevant administrative, technical and academic staff in the School and across the

University.

- To engage in training programmes in the University (e.g. through Staff Development) which are consistent with the RA's ongoing professional development, and the needs and aspirations of the project team and those of the School.
- To maintain confidentiality where relevant at all times and ensure that intellectual property agreements are not violated.
- To assist the academic staff in the project team with the supervision of undergraduate MSc project work and day-to-day supervision and support of other researchers.
- To support Sustainable Engineering teaching delivery as required.
- To carry out specific other duties as may be reasonably requested by the project leaders 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 Equity & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equity & Diversity legislation and University policies/procedures.

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

Organisational Responsibility

Reports to Prof Shahin Rahimifard, Wolfson School of Mechanical, Electrical, and Manufacturing 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	Knowledge of conducting life cycle assessment, preferably for small medical devices	1,2,3
	Knowledge of developing product design guidelines and use of computer-aided design systems, preferably to support circular and/or modular design	1,2,3
	Knowledge of the fields of manufacturing, remanufacturing and recycling technologies and automation processes	1,2,3
	Knowledge of conducting disassembly, repair and refurbish, preferably for small medical devices	
	Experience of generating high quality project reports or other forms of research outputs.	1,3
	Experience of presenting project findings and adapted to specific audience needs, ranging from academic experts to general public	1,3
Skills and abilities	Ability to coordinate project activities, manage project tasks, prioritise and meet deadlines	1,3
	Ability to work independently and also as part of a team	1,3
	Willing to work across Schools and universities to maximize cross- disciplinary outputs	1,3
	Excellent written and oral communication skills	1,3
	Excellent interpersonal, and organisational skills	1,3
	Ability to network with other academics and engage with project stakeholders	1,3
	Ability to write project reports and make technical presentations to industrial and academic research groups	1,3
	Knowledge, awareness and practice of relevant Health & Safety issues	1,3
	Willingness to assist in preparation for meetings	1,3
Training	A willingness to undertake further training as appropriate and to adopt new procedures as and when required	1,3
Qualifications	Have or soon to have a Bachelor or Master levels degree in Mechanical, Manufacturing, Product Design or Material Engineering.	1
Other	Commitment to observing the University's Equal Opportunities policy at all times.	1,3
	Commitment to maintain confidentiality, where relevant, at all times	1,3
	Ability and willingness to travel to national and international partners and undertake visits to project partners lasting 1-3 weeks.	1,3

Desirable Criteria

Area	Criteria	Stage
Experience	Knowledge of environmental standards, in particular ISO14000 family of standards and principles	1,3
	Knowledge of intelligent systems, AI, big data analytics and decision support modelling techniques and tools	
	Experience of using LCA and/or simplified LCA modelling software and tools	1,3
	Knowledge of process design and system engineering	1,3
	Knowledge of a whole system view on the healthcare sector, and design and development of small medical devices	1,3
Skills and abilities	Willingness to work collaboratively with project partners in different locations	1,3

Conditions of Service

The position is FULL TIME and FIXED TERM for a period of 12 months. Salary will be on Specialist and Supporting Academic Research, Grade 5, Salary Band £28,879 - £33,882 per annum, at a starting salary to be confirmed on offer of appointment. The appointment will be subject to the University's Terms and Conditions of Employment for STAFF GRADES 5, details of which can be found here.

The University is committed to enabling staff to maintain a healthy work-home balance, however the nature of roles and responsibilities for this post is not compatible with remote and/or working from home.

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 Equity 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/