

## Research Associate in Circular Economy of Small Medical Devices 2 years, full time

Job Ref: REQ220680

**As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.**

We are looking for a talented and enthusiastic Research Associate with strong interest in circular economy, healthcare sustainability, remanufacturing and recycling, and a background in simulation modelling, operational research, or engineering. This role is based at the School of Business and Economics (SBE), Loughborough University campus. The postholder will work on an exciting and timely project: The Circular Economy of Small Medical Devices, involving a multidisciplinary team of colleagues at Loughborough and Leeds University and industrial partners.

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. In the 2021 Research Excellence Framework (REF) 86% of the Business and Management research was rated as world-leading or internationally excellent.

### Job Description

**Job Grade:** Specialist and Supporting Academic – Research Grade 6

#### Job Purpose:

The Postdoctoral Research Associate 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.

## **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 Sustainable Manufacturing and Recycling Technologies (SMART) within the Wolfson School of Mechanical, Electrical and Manufacturing Engineering, School of Business and Economics and Design School at Loughborough University, the Surgical Technologies Research Group and Division of Health Economics at University of Leeds, 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 products representing complexity vs 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 and devices 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 of the project 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 technologies for remanufacture and material recycling, and the development of business models to support the circular economy and promote behavioural changes.

The role will primarily involve developing business models that quantify and optimize the manufacture, procurement, use and re-use of small medical devices in the circular supply chains and business settings, considering operational and behavioural aspects. This will involve using operational research techniques such as simulation and/or hybrid simulation (discrete-event simulation, agent-based and system dynamics), to be combined with economic evaluation data to assess the feasibility and viability of circular product lifecycles. Models of 4 reference SMD products will be developed with the view to adapting and innovating the current practice in the use, manufacture and disposal of small MDs, using a data-driven approach. Factors such as costs, outcomes, CO2 emissions will be used to evaluate the four case products for different circular design options, including reuse, remanufacturing and recycling.

The successful candidate will be based at the School of Business and Economics and become a vital member of a wider research team of academics and research associates, based at Loughborough University and the University of Leeds. The role involves a mix of independent and collaborative research activities, working alongside other members of the research team and industrial partners, consisting of healthcare organisations and NHS Trusts at the appropriate time.

### **Job Purpose:**

To contribute to, and enhance, research activities that aim to demonstrate the operational and behavioural viability of the Circular Economy for Small Medical Devices in Healthcare Settings using operational research and simulation approaches.

### **Duties and Responsibilities:**

#### ***Research***

- To become familiar with current circular economy practices and business models.

- To conduct research analysis of academic publications using operational research and simulation approaches to assess the viability and efficiency of adopting circular economy practices.
- To produce simulation models to assess the outcomes of adopting CE practice in the product lifecycle of 4 reference small medical devices in healthcare settings.
- Organise and contribute to workshops and meetings with industry partners and analyse key findings.
- Work with industrial partners and other researchers and Investigators to collect data to populate the models.
- To analyse and present research data
- To synthesise and interpret data
- To liaise with academic and industrial project partners, and coordinate activities across the consortium.

### **General, technical**

- To perform risk assessments, develop method statements and implement safe working practices.
- To regularly report research progress to the programme management group through formal and informal reports and communications
- To write research papers suitable for publication in high quality academic journals and for presentation at specialist scientific conferences.
- To supervise student projects in related areas.
- 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.
- Travel to attend meetings/interviews with the project industry partners as required.

### **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 and PhD project work and day-to-day supervision and support of other researchers.
- 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 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 Dr Antuela Tako, Reader in Operational Research, School of Business and Economics.

## 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	Management and delivery of academic research in the area of operational research, simulation, business and management	1, 3
	Knowledge of discrete event simulation, system dynamics and other relevant operational research methods	1, 3
	Report writing for business and academic stakeholders	1, 3
	Experience of presenting research findings at all levels, adapted to specific audience needs, ranging from academic experts to general public	1,3
	Relevant experience in an academic research environment or equivalent industrial experience.	1,3
	Record of high quality publications or other forms of research outputs.	1,3
Skills and abilities	Ability to work independently and as part of a team	3
	Ability to coordinate project activities, manage project tasks, prioritise and meet deadlines	1,3
	To have a working knowledge of the following Microsoft Packages and programming languages: Word, Excel, Power Point, Discrete Event Simulation, System Dynamics or Agent-Based Simulation packages	1, 3
	Excellent written and oral communication skills	1,3
	Excellent interpersonal, and organisational skills	1,3
	Analytical skills and quantitative data analysis	1, 3
	Willingness to develop skills in workshop facilitation and leading stakeholder group workshops	1, 3
	Ability to contribute to project reports to industrial and academic research groups	1, 3
	Willingness to work across Schools and universities to maximize cross- disciplinary outputs	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
	Skills in finding information in the scientific literature and proposing original ideas	1,3
	Knowledge, awareness and practice of relevant Health & Safety issues	1,3
	Training	Willingness to undertake further training as appropriate and to adopt new procedures as and when required

Qualifications	Ph.D. qualification in a relevant subject area (operational research/business analytics/management science, industrial engineering, business and management) or equivalent experience	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
	Willingness to travel and do medium-term visits to project partners	1, 3

### Desirable Criteria

Area	Criteria	Stage
Experience	Experience of working with external industrial organisations	1, 3
	Experience of organising workshops	1, 3
	Experience and understanding of healthcare organisations and settings	
	Experience in supervising junior members (e.g. PhD or final year project students)	1,3
	Writing research proposals for funding from internal/external sources.	1,3
	A whole system view on the healthcare sector, and design and development of small medical devices	1,3
	Experience in the fields of sustainable design and manufacturing, remanufacturing and recycling technologies and automation processes	1,3
Skills and abilities		
	Knowledge of AnyLogic, SIMUL8, iThink/Vensim	1, 3
	Experience of working as part of a multidisciplinary team	1, 3
	Willingness to work collaboratively with project partners in different locations	1,3

### Conditions of Service

The position is FULL TIME and FIXED TERM for 24 months. Salary will be on Specialist and Supporting Academic Research, Grade 6, Salary Band £31,406 - £40,927 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 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 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-swam/>

The application closing date is **25<sup>th</sup> July 2022**. Interviews will take place on **18<sup>th</sup> August 2022**