

Research Associate in Innovative Advanced Materials and Manufacturing

Job Ref: REQ260478

School/Department summary:

The Wolfson School of Mechanical, Electrical and Manufacturing is one of the leading Engineering Schools in the country. With a strong tradition in Manufacturing and in the discovery and application of Materials for applications in a broad range of industrial sectors (e.g., electronics, bioengineering & healthcare, automotive, food industry, etc), we strive for academic excellence and research at the leading edge.

Project Description: The project entails the development, analysis and engineering of advanced low-dimensional functional materials, additive manufacturing and device integration in multisectoral applications spanning wearable sensors for health, sport and wellness, e-fibres and e-textiles, neuromorphic computing and device applications for consumer electronics and defence.

Examples of engineered materials include quantum dots (0D), carbon nanotubes and semiconductor nanowires (1D), graphene and other two-dimensional materials (2D), polymers and nanocomposites. The role will involve selecting and optimising material structures, optimising ink formulations for device integration in flexible and stretchable substrates, including polymeric and textile substrates, using additive manufacturing techniques, such as printing, coating and non-lithographic techniques, while maintaining optimum device performance, accuracy and reliability.

Key Requirements:

The ideal candidate will have:

- Experience in formulation, optimisation and integration of functional materials in flexible and wearable substrates, including polymeric and textile substrates.
- Experience in the use of analytical equipment in a laboratory environment including morphological (AFM, SEM, TEM), electrical, optical, spectroscopic (Raman, UV/Vis, FTIR) and chemical characterisation.
- Experience working with computational modelling and CAD tools (e.g. Matlab, COMSOL, Abaqus, Geant4) to assist the design and optimisation tasks.
- Experience of acquiring, curating and analysing data derived from field trials (including human or animal subjects) and analytical techniques.
- Demonstrate excellent communication and interpersonal skills.
- Experience working in a lab, including the preparation of risk assessments and COSHH forms to ensure a safe working environment.
- Engaged in translational and/or entrepreneurship programs aiming to exploit research outputs.
- A PhD degree (or close to completion) in a related subject, or equivalent experience.

Job Description

Job Family and Grade: Specialist and Supporting Academic Research Grade 6

Job Purpose

To conduct research in the area of smart wearables and flexible/textile-based sensors and to be responsible for development, formulation, and integration of functional materials into flexible substrates. To role involves undertaking primary data collection from field trials, performing computational modelling, and advancing health and wellness monitoring technologies.

Job Duties

- To investigate and develop advanced low-dimensional functional materials and conductive inks for integration into flexible and wearable substrates.
- To design, fabricate, and evaluate smart wearable and textile-based sensors and systems for data-driven personalised monitoring, including biophysical, biomechanical parameters during training, exercise and steady conditions.
- To apply specialist knowledge in parametric modelling and CAD tools, including Abaqus, COMSOL, and MATLAB, to assist device design and optimisation.
- To undertake systematic chemical, optical, and morphological characterisation of materials and devices using AFM, SEM, TEM, Raman, UV-Vis, and FTIR spectroscopy.
- To collate, manage, and evaluate data desived from experimental testing and human field trials to ensure accurate analysis of bio-signals.
- Ti establish and refine additive manufacturing and printing techniques for wearable textile electronics, including digital printing, screen printing, spray lithography and controllable starching treatment.
- 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.
- Always maintain confidentiality 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-to-day 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.

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 outlined in the document.

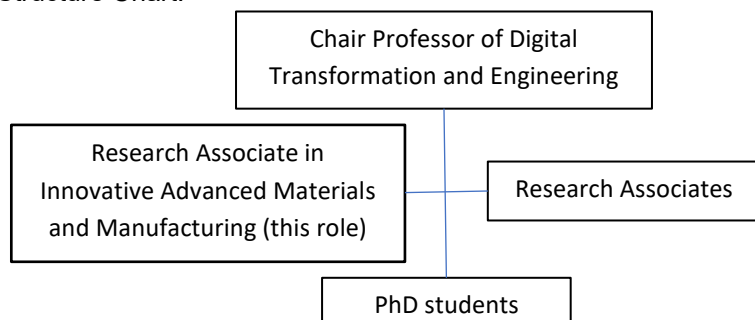
Organisational Responsibility

Reports to the: Chair Professor of Digital Transformation and Engineering

Direct Reports: 2 PhD students

Budget Responsibilities: N/A

Structure Chart:



Person Specification

Your application will be assessed based on the essential and desirable criteria listed below.

Applicants are strongly encouraged to explicitly demonstrate how they meet each essential (and desirable) criteria at the application stage. The criteria that you need to demonstrate in your application will be listed as Stage 1 in the table below.

Stages of assessment are as follows:

- 1 – Criteria measured at Application
- 2 – Criteria measured at Test/Assessment Centre/Presentation
- 3 - Criteria measured at Interview

Essential Criteria:

Area	Criteria	Stage
Experience	Background in Engineering, Chemistry or Materials Science, with focus on soft electronic materials	1
	Demonstrated experience in the formulation, optimisation, and integration of conductive inks and low-dimensional functional materials into textile and polymeric substrates	1
	Authorising original work for academic journal papers, conference papers or technical reports	1
Skills and abilities	Expertise in designing and evaluating wearable or textile-based sensors for human bio-signal monitoring.	1, 2
	Good written and oral communication skills	1, 2
	Self-motivated with ability to meet deadlines	3
	Able to manage time and task effectively to meet project deadline and prioritise workload with minimum supervision	3
	Able to build and maintain effective working relationships with academic colleagues, students, and external partners to support collaborative research and communication of findings.	3
	Working knowledge of CAD and computational modelling software packages, including Abaqus, COMSOL, and MATLAB	1, 3
	Working knowledge of specific analytical characterisation techniques, including morphological (AFM, SEM, TEM) and spectroscopic (Raman, UV/Vis, FTIR) methods	3
	Ability to write project reports and make technical presentations to industrial and academic research groups	3
	Knowledge of relevant Health & Safety issues	1
Training	Demonstrate evidence of having undertaken further training in laboratory safety, including the preparation of risk assessments and COSHH forms.	2, 3
Qualifications	PhD (or near completion) in Engineering or a closely related discipline	1
Other	Uphold and actively contribute to the University's commitment to Equity, Diversity and Inclusion.	1,3

Desirable Criteria:

Area	Criteria	Stage
Experience	Further project-specific experience in securing and contributing to translational research grants or entrepreneurship programs.	1, 3
	Developing proposals for funding from external agencies	1, 3
	Working in a high-quality academic research environment	1
	Experience of teaching and / or supervision of students in relevant areas	1
Skills and abilities	Authoring original work, in the highest quality refereed academic journals	1
	A strong publication track record in high-impact journals and conference proceedings.	1
Qualifications	PhD (or close to completion) degree in a related subject or equivalent experience.	1

Conditions of Service

The appointment will be subject to the [University's Terms and Conditions of Employment](#) relevant to the job grade.

Shared University Responsibilities

As a member of the Loughborough community, you are expected to:

- Take reasonable care of yourself, others and the environment, and to prevent harm by your acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Sustainability Policies & Procedures.
- Support and contribute to the University's commitment to Equity, Diversity, and Inclusion (EDI), while carrying out all duties in a way that respects these principles and upholds the right to free expression. Further information about EDI at Loughborough and our strategic aims is available on our website

Our Purpose, Vision, and Values

Our purpose, Vision and Values underpin all that we do and shape how we work together at Loughborough.

We're proud to promote our values: **Adventurous**, **Collaborative**, **Creative**, **Authentic** and **Responsible**. Our people bring these values to life every day, and they are central to the positive and supportive culture that makes Loughborough unique.

If you join us, you'll be encouraged to bring these values to life in your own work and contribute to the positive, supportive culture that makes Loughborough unique.

Read more about our [vision and values](#).

Our Accreditations



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.



We are proud to be a [Race Equality Charter Member](#). The Charter aims to improve the representation, progression and success of all minority ethnic staff and students within higher education and address issues of racism within higher education institutions (HEIs).



We are proud to be a Disability Confident Employer and have adopted a proactive approach to employing disabled people and to creating a more diverse workforce. We ensure that our recruitment processes are inclusive and accessible. We guarantee to offer an interview to all applicants who have declared themselves with a disability, provided they meet the essential criteria for a role. We proactively anticipate and provide reasonable adjustments and support existing employees who acquire a disability or long-term condition to thrive in the workplace.



We are a real living wage employer, and our Living Wage Employer Mark shows our commitment to paying our staff according to the cost of living.



We are proud supporters of the [City of Sanctuary movement](#) and delighted to be recognised as a University of Sanctuary. This national network brings together, university staff, lecturers, academics and students, who together work to make Higher Education institutions place of safety, solidarity and empowerment for people seeking sanctuary.

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.