Wolfson School of Mechanical, Electrical and Manufacturing Engineering

Loughborough University

Research Associate in *Signal Processing and Machine Learning for 6G Networks*

Job Ref: REQ260405

School/Department summary:

We are seeking a talented and motivated Postdoctoral Research Associate (PDRA) to join an EPSRC-funded project at Wolfson School, Loughborough University. Loughborough University is internationally recognised for the impact and relevance of its research, with strong links to industry, government and the public sector. Engineering at Loughborough is one of the largest in the UK, bringing together expertise across electrical engineering, mechanical engineering, and manufacturing within a highly collaborative, interdisciplinary environment.

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.

Project Description: This project is on developing signal processing and machine learning techniques for 6G networks. This is a collaborative research project (Pervasive Wireless Intelligence Beyond the Generations (PerCom) and TITAN extension) with several UK academic partners. This project is funded by the Engineering and Physical Sciences Research Council (EPSRC).

Job Description

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

Job Purpose

The focus will be on the development of signal processing and machine learning algorithms and implementation of them in a USRP-based communication system. In particular, the Research Associate will be expected to perform research and develop algorithms for physical layer of 6G networks. The Research Associate will collaborate with several project partners including University of Southampton, among other potential academic and industrial partners.

Job Duties

- *To conduct research in physical layer of a communication system*
- *To propose and develop signal processing and machine learning algorithms for 6G networks*
- *To implement algorithms in a USRP-based hardware system.*
- *To demonstrate algorithm implementation*
- 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-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.

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: Dr Mahsa Derakhshani

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	Research experience in signal processing and/or machine learning for wireless communications.	1, 3
	Experience in implementation of wireless communication algorithms in USRP	1, 3
	Authorising original work for academic journal papers, conference papers or technical reports	1, 3
Skills and abilities	Analysing signal processing techniques and/or machine learning methods.	
	Good written and oral communication skills	3
	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 software packages, MATLAB, Python	1, 3
	Working knowledge of specific analytical, numerical methods, optimisation theory, machine learning	1, 3
	Ability to write project reports and make technical presentations to industrial and academic research groups	1, 3
	Knowledge of relevant Health & Safety issues	3
Training	Willingness to undertake appropriate further training and to adopt new procedures as and when required	1, 3
Qualifications	A PhD (or near completion) in Electronic Engineering or relevant Engineering field.	1
Other	Uphold and actively contribute to the University's commitment to Equity, Diversity and Inclusion.	1,3

Desirable Criteria: These are skills, experience and competencies that are additional extras that may be used to narrow the pool down if we receive a high volume of applications all meeting the essential criteria.

Area	Criteria	Stage
Experience	Practical experience of working on wireless communication algorithms in USRP	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 IEEE Transactions	1
Qualifications	PhD degree (or near completion) in signal processing or wireless communications or machine learning.	1
Other	Knowledge of beyond 5G standards	1, 3

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

Athena SWAN Bronze Award

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.